

**MINISTRY OF HEALTH**  
**THAI BINH MEDICAL COLLEGE**  
**NATIONAL INSTITUTE OF MALARIA, PARASITOLOGY**  
**AND ENTOMOLOGY**

**KAP STUDY ON SCHOOL SANITATION**  
**AND CONTROL OF WORM INFECTION**



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## REPORT

# KAP STUDY ON SCHOOL SANITATION AND CONTROL OF WORM INFECTION

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## **KAP STUDY ON SCHOOL SANITATION AND CONTROL OF WORM INFECTION**

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*WATSAN Centre of Thai Binh Medical College and the Institute of Malaria, Parasitology and Entomology were assigned and supported by UNICEF Ha Noi to conduct the KAP study on the school sanitation and the control of worm infection on primary school children, their parents and community at 24 communes in 4 districts in Nam Dinh, Ha Tinh, Yen Bai and Bac Giang to improve the School Sanitation and Hygiene project in the coming periods.*

*Close co-operations were made with UNICEF Ha Noi office, Education and Training Departments, Centres for Preventive Medicine of the provinces, districts under the study Supports were provided by UNICEF Ha Noi, Centres for Preventive Medicines of the provinces & districts under the survey in all steps of the study, namely study design, pilot study, fieldwork, data processing and analysing.*

*We would like to express our thanks to Ministry of Health, UNICEF Ha Noi, especially to Mr. Mohammad Omar and Mr. Nguyen Quang Quynh, local authorities, health and education sectors for their facilitations given to the study team.*

*On this occasion, we would like to thank investigators, thousands of pupils, parents and community members for their participations in and contributions to the study.*

**TRINH HUU VACH, Ph.D.**

**DIRECTOR OF WATSAN CENTRE**

## I. INTRODUCTION

Thousands of sanitation facilities have been built and put into operation in primary schools since 1991 with supports from UNICEF Ha Noi through the integrated program on Health Education, Water and Environment Sanitation - Ministry of Education and Training. This is an appropriate policy of UNICEF and the Ministry of Education and Training aiming at health protection and strengthening hygienic behaviours obtained from health education among school children. Their practices will be gradually be changed and the information then delivered to their families and community, hence, environmental sanitation will be strengthened.

So far, these facilities have been built and put in use in most provinces. There may have been certain newly arising problems in construction, usage and maintenance. In most schools, health education in general and water and environmental sanitation education in particular have been conducted through hygiene education campaign, health education curriculum, posters, leaflets and mass media.

It is necessary to determine how much information reach pupils and to examine the flow of information from pupils to their families and community, its influence in changing practices of families/community. In the end, we would see if children are agents for changes.

The study was financially supported by UNICEF WES Cluster NYHQ/UNICEF Ha Noi and implemented by WATSAN-Thai Binh Medical College, Institute for Malaria, Parasitology and Entomology-Ministry of Health.

## **II. OBJECTIVES**

### **1. General objectives:**

To evaluate the influences of health, water and environmental sanitation education; school sanitation facilities on the improvements of sanitary practices at schools, families/communities.

### **2. Specific objectives:**

- To assess knowledge, attitude and practice on water, environmental sanitation, control of worm infection of school children, their parents and community members.
- To assess if the information on water, environmental sanitation and control of worm infection reach pupils.
- To assess if the information is transferred to families and communities, how the information influence.
- To assess the level of intestinal parasite infection among school children and to evaluate the impact of water and sanitation and parasite control activities toward the reduction of infection rate.
- To give recommendations for better management, implementation of the program.

## **III. STUDY METHODOLOGY**

### **1. Study site**

Selected site of the study were four provinces in different ecological areas in the North. They were Yen Bai, Bac Giang (northern midland/mountainous provinces), Nam Dinh (Red River Delta), Ha Tinh (north central).

In each province, one district undergoing UNICEF school sanitation program was selected. In each district, four communes with UNICEF school sanitation facilities (case) and two communes without school sanitation facilities (controls) were randomly selected. Totally, 24 communes were selected to be study sites, of which 16 communes with school sanitation facilities provided with support from UNICEF and 8 communes without the facilities.

The UNICEF school sanitation facilities include:

- One tubewell or protected dug well located near sanitation areas. Water from the well is pumped by UNICEF hand pumps or electric pumps to tanks/reservoirs piped to latrines, urination and washing areas.
- Washing areas include water taps.
- Latrines include 2, 4 or 6 seats separated for boys and girls.
- Urination areas separated for boys and girls.

At all the 24 schools (16 case and 8 control), health education was being taught.

## **2. Quantitative study by structured questionnaire**

The interviewees for quantitative study were pupils of primary schools, pupil's parents and other adults who do not have children attending primary schools at the communes (community group).

At each commune, interviews with structured questionnaire were conducted for 40 pupils of 3<sup>rd</sup>-5<sup>th</sup> grade, 40 pupil's parents and 40 other adults in combination with direct observations on household environmental sanitation and sanitation facilities. Hence, the number of participants for quantitative study was 2,880, out of the total, 960 were pupils and 1,920 adults.

Systematic random sampling technique was used for sample selection. Pupils of 3<sup>rd</sup>-5<sup>th</sup> grade, pupil's parents and other adults at study sites were separately listed. Random table was used to select the first people in the list, next ones were selected by interval sample of the list.

# MAP OF VIET NAM

## STUDY SITES

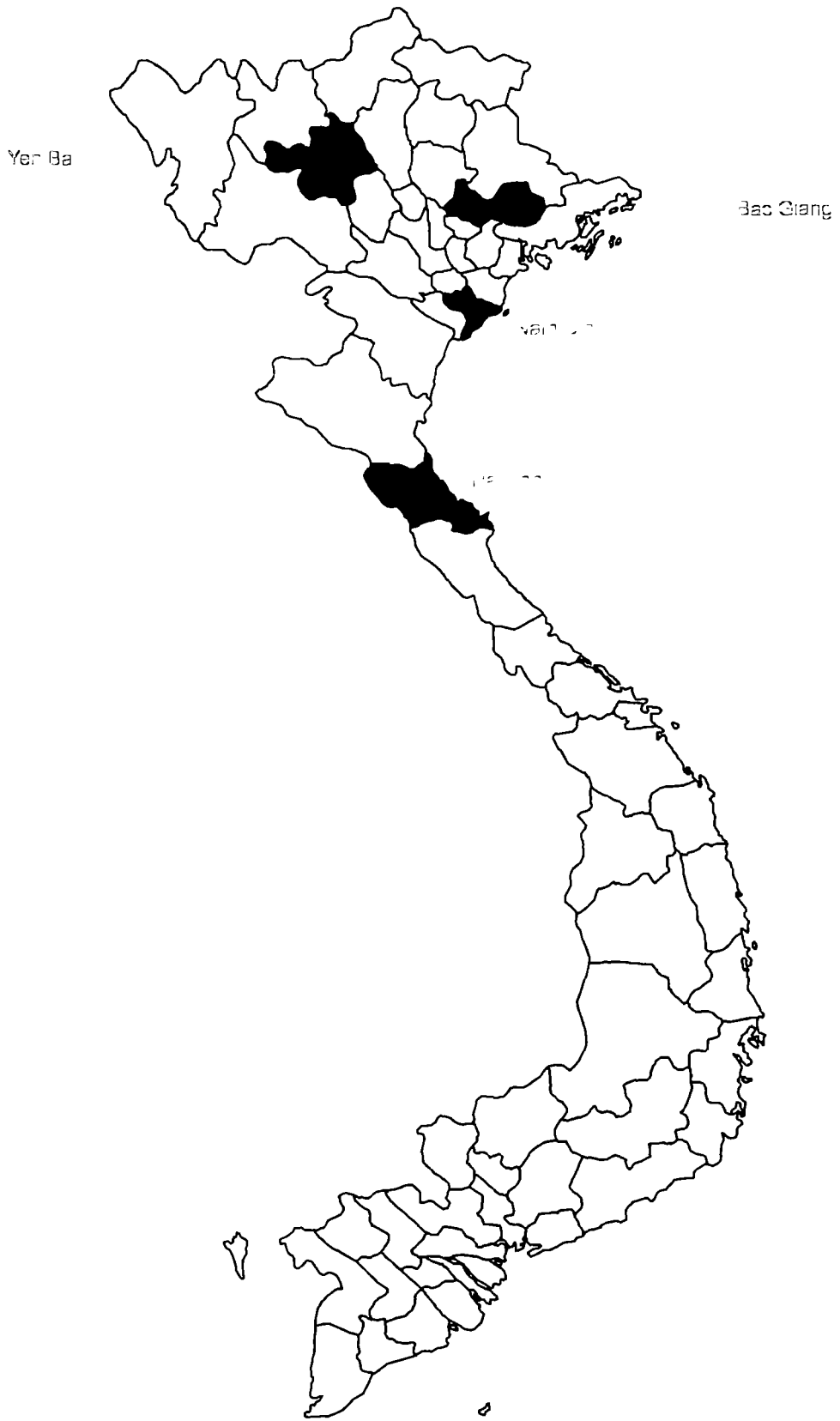


Table 1: List of communes under the study

No.	Commune	District	Province
1	Xuan Hong ( <i>case</i> )	Xuan Truong	Nam Dinh
2	Xuan Tan ( <i>case</i> )		
3	Xuan Ngoc ( <i>case</i> )		
4	Xuan Dai ( <i>case</i> )		
5	Xuan Trung ( <i>control</i> )		
6	Xuan Chau ( <i>control</i> )		
1	Cuong Thinh ( <i>case</i> )	Tran Yen	Yen Bai
2	Nga Quan ( <i>case</i> )		
3	Minh Tien ( <i>case</i> )		
4	Tran Yen ( <i>case</i> )		
5	Minh Quan ( <i>control</i> )		
6	Viet Thanh ( <i>control</i> )		
1	Huong Son ( <i>case</i> )	Huong Son	Ha Tinh
2	Son Giang ( <i>case</i> )		
3	Lam Truong ( <i>case</i> )		
4	Son Truong ( <i>case</i> )		
5	Son Tay ( <i>control</i> )		
6	Son Ha ( <i>control</i> )		
1	Bich Son ( <i>case</i> )	Viet Yen	Bac Giang
2	Tang Tien ( <i>case</i> )		
3	Quang Minh ( <i>case</i> )		
4	Hoang Ninh ( <i>case</i> )		
5	Ninh Son ( <i>control</i> )		
6	Quang Chau ( <i>control</i> )		

*Note: case refer to communes where sanitation facilities provided UNICEF available at primary school, control are communes without UNICEF school sanitation facilities.*

### 3. Qualitative study by in-depth interviews and group discussions

At each province, 16 in-depth interviews were conducted: 2 for chairpersons of communal people's committee, 2 for principals of primary school, 4 for teachers, 4 for pupils and 4 for pupil's parents. Totally, there were 64 in-depth interviews at the 4 provinces.

At each province, 4 group discussions were held, one for teachers, one for pupils, one for pupil's parents. Totally, there were 16 group discussions at the 4 provinces.

### 4. Direct observations

Direct observations with checklists were conducted by investigators on sanitary conditions, construction technique, usage of sanitation facilities at 16 schools and 1,920 households.

## 5. Study on intestinal worm infection among pupils, worm eggs in soil at schools.

This was conducted at 4 primary schools at 2 districts:

At Tran Yen district, Yen Bai: Viet Thanh primary school (without UNICEF sanitation facilities, overhang latrines was used) and Co Phuc primary school (with UNICEF sanitation facilities)

From lists of pupils at the schools, 204 pupils (6-10 year old) in Co Phuc and 201 (6-10 year old) in Viet Thanh were randomly selected for stool examinations for worm eggs. Total of 405 stool samples were collected at the two schools. At each school, 20 soil samples were collected (total 40) from school ground and near paths to evaluate infection of Ascaris, Trichuris, Hookworm eggs in external environment.

At Xuan Truong, Nam Dinh: Xuan Hong primary school (with UNICEF sanitation facilities) and Xuan Chau primary school (no UNICEF sanitation facilities, use overhang latrines)

224 stool samples were randomly collected from 6-10 year old pupils in Xuan Hong and 227 samples from Xuan Chau (total 451). Total of 40 soil samples were collected at school ground, near paths (20 in each school), analysed to evaluate infection rate and density of Ascaris, Trichuris and Hookworm in external environment.

### *Method for examination:*

+ Kato method was used to evaluate infection rate, Kato-Katz method was used to evaluate density of infection. The following indicators were used:

$$\text{Prevalence of infection} = \frac{\text{No. of subjects testing positive}}{\text{No. of samples examined}}$$

+ Prevalence of each species.

+ Cumulative prevalence of infection (infection rate with at least one species)

+ Density of infection of each species.

$$\text{Mean epg} = \frac{\text{Sum of each individual epg}}{\text{No. of subjects examined}}$$

% of pupils with heavy infection density (according to WHO, Epg>50,000 for *Ascaris*, Epg>10,000 for *Trichuris*, Epg>4,000 for *Hookworm*)

Soil examinations with Romanenko method: % of soil samples positive with worm eggs & density of eggs/100 gram of soil.

#### IV- FINDINGS AND DISCUSSIONS

##### A. KNOWLEDGE, ATTITUDE OF TEACHERS & LOCAL AUTHORITIES TOWARD HEALTH EDUCATION, SCHOOL SANITATION FACILITIES AND ENVIRONMENT SANITATION

###### 1. Teachers

*Role of schools:* schools have special role at every community in Viet Nam. There are several primary schools in each commune, district. Schools are not only place for education and training for young people but also closely relate to community by means of activities of teachers and pupils, their relations with local authorities, mass organisations and pupil's parents. "Schools are similar to society miniatures, children learn all things at schools, including ways of living; keeping hygiene. If they successfully practice at schools, they will do it at home. Schools have great influences on community in term of environmental sanitation and control of worm infection. Adults learn about the construction of sanitation facilities from schools. They realised that the schools were clean. Apart from it, teachers and pupils take part in cleaning activities and sanitation information campaign at villages" (Mr. Chu Ba Duong, principal of Quang Minh primary school, Viet Yen, Bac Ninh). It can be seen that the schools with good teachers, good teaching aids play an important role in education and training for children.

*About teaching health education subject:* among education for primary school children, health education is a great concern at schools.



Talking to Ms Tran Thi Phuong Thao, teacher in Huong Son; Ha Tinh, she said *"Health is the most important for people, our tasks are not only to educate pupils but also to make their parents aware of the importance of health. Education on personal hygiene; environment sanitation is extremely important for small children, these will be foundations for subsequent knowledge and behaviours when they grow up. In comprehensive education, these are inevitable issues"*

Hence, health education is a curriculum subject at all primary school. This is one of the 9 compulsory subjects with textbooks and exercise books, not only about knowledge but also contribute to personality formation. Hygiene behaviours of pupils both at schools and at home are considered important, these are indicators for competitions at schools. In several instances, strict supervisions were made on sanitary practices. At schools, detail instructions were given on sanitation tasks with specific plan. School sanitation boards conduct regular checks, sometime it was 6 times a day. Afterward, judgements were made, good classes and individuals were praised.

In teaching health education, teachers often relate lessons with reality & they consider practices are goals of lessons. The teachers combine health education with other subjects, they consider health education should go with other subjects to be effective and they do this whenever possible.

Apart from lessons, extra curriculum activities were also organised e.g. meetings of pioneer with health education as subject. Teachers and pupils participate in general cleaning activities at villages, conduct information sections on sanitation at community. There were always co-operations from health sector and under direction from local authorities.

*Role of school sanitation facilities:* the UNICEF sanitation facilities have created great effects on health education at schools. The teachers and pupils, when being asked, all said that school sanitation facilities meet required criteria and very persuasive, the facilities make lessons clearer for pupils.

Lessons and observations of pupils then became an important source of information for community, the first people who receive the information were other family members.

The teachers themselves had regular contacts with pupil's parents. Apart from the 3 periodical meetings a year, teachers often meet with parents to discuss matters relate to learning of pupils at schools. During the meetings, health education for pupils were addressed. Parents also visit the facilities where available, all these have influenced the parents. This was revealed during interviews and group discussions of teachers and pupil's parents.

Talking about the ability to build or expand sanitation facilities for primary schools, all pupils' parents agreed. They are all willing to contribute labour yet some of them found it was difficult to contribute money. We would like to have external assistance for school sanitation facilities.

## 2. Local authorities

With regard to safe water, environment sanitation and control of worm infection, local authorities had clear concepts and took that as responsibility in local governmental management, responsibility for comprehensive education, including health education and environment sanitation.

Local authorities often pay great attentions to schools in spite of difficult economic conditions of the communes. In all the communes, there were communal education boards, standing committees of pupils' parents. In most communes, there were management boards for environment sanitation with representatives from schools. On the beginning of school years, leaders from communal people's committee always present and discuss with leaders of schools about education, including health education. Mr. Nguyen Tien Sinh, head of Tran Yen people's committee (Yen Bai) said "*We discuss with school leaders on how to make pupils become disseminators, influence sanitation behaviours not only inside the schools but also outside the schools, i.e. the local community*"

Health care for children were organised by communal people's committee such as health examinations at schools, provisions of de-worming pills, construct water supply system, repair sanitation facilities, etc. Funds were always allocated for education and environment sanitation at communes.

Talking about school sanitation facilities, Mr. Nguyen Van Tinh, vice-chief of people's committee of Bich Son (Viet Yen, Bac Giang) said "*Septic latrines create positive sanitation thinking among pupils, teachers and families*"

Communal leaders highly appreciate the nuclear role of schools in influencing families, community and work on environmental sanitation. Mr. Nguyen Van Tinh comment *"Children study health education at schools though they are young, these will form their consciousness about keeping hygiene, environment protection at home, village and schools. Pupils then bring the information to their families members, take part in sanitation activities, creating new living style. Hence, work on environment sanitation has been socialised"*

There were prizes for pupils with good education records, good morality and good sanitation practices in many villages, communes.

Communal leaders all expressed desires to build sanitation facilities for primary schools, to receive further UNICEF supports to ensure one sanitation facility/school. If the supports are available, local government and people will be willing to contribute.

## B. KAP OF PUPILS ON ENVIRONMENTAL SANITATION, CONTROL OF WORM INFECTION

At the 24 communes under the study, KAP study were conducted on 961 pupils, 487 boys (51%) and 474 girls (49%), of the total, 320 (33.3%) from schools without sanitation facilities (control), 641(66.7%) from school with sanitation facilities (case). There were 4 in-depth interviews, 10 pupils' group discussions. The results are presented in table 2:

**Table 2: Number of pupils received KAP interviews**

School \ Pupils	No sanitation facility		Facility available		Total	
	n	%	n	%	n	%
1. Boys	166	51.9	321	50.1	487	51.0
2. Girls	154	48.1	320	49.9	474	49.0
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>

*Note: school sanitation facilities here refer to the facilities provided by UNICEF.*

### B1. PUPILS' KNOWLEDGE AND ATTITUDE:

#### 1. Scattered human excreta is insanitary

Most pupils at the two groups of schools said that human excreta scattered at roads, fields were insanitary (95.3%), 96.1% at control and 93.8% at case schools. The difference is not remarkable because the pupils all learn health education subject. The rest of 4.7% said not insanitary, this address needs for strengthening health and environmental sanitation education (Table 3).

**Table 3: Knowledge on the insanitary of human excreta scattered**

Answer \ Pupils at schools	No sanitation facility		Facility available		Total		p>0.05
	n	%	n	%	n	%	
1. Insanitary	300	93.8	616	96.1	916	95.3	p>0.05
2. Not insanitary	20	6.2	25	3.9	45	4.7	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

## 2. Sanitary place for defecation

Most pupils (98.0%) knew that it was sanitary to defecate at latrines, the rate was equal between two groups of schools. Some pupils didn't know means of stool collection and disposal, they had wrong answers that it was sanitary to defecate at pigpens, gardens. The difference between case schools and control schools is not significant with  $p>0.05$  (3.1% vs. 1.4%)

**Table 4: Knowledge about sanitary place for defecation**

Answer \ Pupils at schools	No sanitation facility		Facility available		Total		p>0.05
	n	%	n	%	n	%	
1. Latrines	310	96.9	632	98.6	942	98.0	p>0.05
2. Other places	10	3.1	9	1.4	19	2.0	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

## 3. Sanitary latrines

In Viet Nam, health sector considered the following latrines sanitary: double-tanks, septic, Sulabh and improved dug latrines (for mountainous areas). Rate pupils knew 1-4 types of sanitary latrines was high (94.2% at case schools, 86.9% at control schools). Rate of wrong answers was 5.8% and 13.1% respectively. The difference is significant with  $p<0.001$ . Highest rate was for double compartment latrines (56.5%), this type of latrine has been propagated by Ministry of Health and applied in the recent 3 decades for rural areas.

More pupils knew 3-4 types of sanitary latrines at case schools than at control schools for the reason that septic latrines were being used at the case schools (7.9% vs. 1.3%). The difference is significant with  $p<0.001$ .

**Table 5: Knowledge of pupils on types of sanitary latrines**

Pupils at schools Answer	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. 1 type	190	59.4	353	55.1	543	56.5	p>0.05 p>0.05 p<0.001 p<0.001
2. 2 types	83	25.9	200	31.2	283	29.5	
3. 3-4 types	5	1.6	51	7.9	56	5.8	
		86.9		94.2		91.8	
4. Don't know	42	13.1	37	5.8	79	8.2	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

#### 4. Safe water for drinking

Safe water for drinking are: piped water, rain water, tubewell water, protected dug well water. Table 6 show that 98.3% knew at least one source of clean water, 99.2% pupils at the case schools knew 1-4 sources of safe water, 0.8% didn't know any, the corresponding rate were 96.2% and 3.8% at control schools. The difference is significant with  $p<0.01$ . Nevertheless, analysing number of water sources, there is no significant difference (Table 6)

**Table 6: Knowledge of pupils on sources of safe water.**

Pupils at schools Answer	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One source	122	38.1	252	39.3	374	38.9	p>0.05 p>0.05 p>0.05 p<0.05
2. Two sources	95	29.7	220	34.3	315	32.8	
3. Three-four sources	91	28.4	164	25.6	255	26.6	
		96.2		99.2		98.3	
4. Don't know	12	3.8	5	0.8	17	1.7	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

#### 5. Diseases caused by contaminated water

Diseases caused by contaminated water are diarrhoea, hepatitis, worm infection, trachoma and skin diseases, genealogical diseases. It was found that 96.4% pupils at the case schools knew 1-8 diseases, 90.6% at control schools. The difference is significant with  $p<0.001$ . If we calculate sorts of diseases, there was no significant difference ( $p>0.05$ )

**Table 7: Knowledge of pupils on diseases caused by contaminated water.**

Pupils at schools Answer	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. 1 disease	86	26.9	161	25.1	247	25.7	p>0.05
2. 2 diseases	85	26.6	196	30.6	281	29.3	p>0.05
3. 3 diseases	70	21.9	135	21.1	205	21.3	p>0.05
4. 4 diseases	36	11.2	88	13.7	124	12.9	p>0.05
5. 5-8 diseases	13	4.0	38	6.0	51	5.3	p>0.05
		90.6		96.4		94.5	p<0.001
6. Don't know	30	9.4	23	3.6	53	5.5	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 6. Boiling water before drinking

Boiling water before drinking is to kill germs and be hygienic. Data show that 94.1% pupils at case schools knew 1-3 effects of boiling water before drinking, 5.9% didn't know any, the corresponding rate was 90.3% and 9.7 at the control. The difference is significant with  $p<0.05$ . Pupils know 2-3 effects at case school was all higher than control. The difference is significant with  $p<0.05$  (26.1% vs. 19%)

**Table 8: Knowledge of pupils on effects of boiling water before drinking**

School Answer	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One	228	71.3	436	68.0	664	69.1	p>0.05
2. Two-three	61	19.0	167	26.1	228	23.7	p<0.05
		90.3		94.1		92.8	p<0.05
3. Don't know	31	9.7	38	5.9	69	7.2	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 7. Causes of worm infection

Causes of worm infection are eating raw vegetables without proper cleaning, drinking unboiled water, no handwash before meals or after defecation, no handwash with soap, flies visits foods, contacting with excreta or contaminated soils. As pupils already had these knowledge from health education, 94.8% pupils could tell 1-8 causes, it was 97.0% at case school and 90.3% at control schools. The difference is significant with  $p<0.001$ . Pupils at control schools knew 2 causes was higher ( $p<0.05$ ), 4 causes was lower ( $p<0.01$ ).

**Table 9: Knowledge of pupils on causes of worm infection**

Answer	School	No sanitation facility		Facility available		Total		
		n	%	n	%	n	%	
1. One cause		59	18.4	110	17.2	169	17.6	p>0.05
2. Two causes		103	32.2	165	25.7	268	27.9	p<0.05
3. Three causes		70	21.9	172	26.8	242	25.2	p>0.05
4. Four causes		31	9.7	100	15.6	131	13.6	p<0.05
5. 5-8 causes		26	8.1	75	11.7	101	10.5	p>0.05
			90.3		97.0		94.8	p<0.001
6. Don't know		31	9.7	19	3.0	50	5.2	
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 8. Harms of worm infection

Worm infection cause abdominal pain, mal-digestion, poor physical conditions, weight loss, anaemia, intestine obstruction, worm evacuate to bile duct, etc. Knowledge of pupils on harms of worm infection is presented in table 10. Pupils at case schools know more about harms of worm infection: 90.8% pupils at case schools knew 1-5 harms, the corresponding rates was 84.1% at control schools. The difference is significant with  $p<0.001$ . Pupils knew one harm at control schools was higher than at case schools, knew many harms was lower. The difference is significant with  $p<0.001$ . It should be noted that a remarkable proportion of pupils (11.4%) didn't know any harm.

**Table 10: Knowledge of pupils on harms of worm infection**

Answer	School	No sanitation facility		Facility available		Total		
		n	%	n	%	n	%	
1. One harm		184	57.5	267	41.7	451	46.9	p<0.001
2. Two harms		61	19.1	214	33.4	275	28.7	p<0.001
3. Three-five harms		24	7.5	101	15.7	125	13.0	p<0.001
			84.1		90.8		88.6	p<0.01
4. Don't know		51	15.9	59	9.2	110	11.4	
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 9. Measures to control worm infection

As the pupils have learnt, control of worm infection are cleaning homes; use sanitary latrines, don't defecate outside latrines, no use untreated excreta for crop fertilisation, no eating raw vegetables, no drinking unboiled water, use safe water, prevent flies from visiting foods, handwash before meals & after defecation, handwash with soap, take de-worming pills, etc.

Rate of pupils could tell 1-11 measures to control worm infection was high (96.0%), 97.3% at case schools, 93.4% at control schools. The difference is significant with  $p < 0.01$ . Rate of 2 measures was higher at case schools yet 3-5, 6-11 measures lower. The difference is significant ( $p < 0.01$ ,  $p < 0.05$ )

**Table 11: Knowledge of pupils on measures to control worm infection.**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One measure	47	14.7	68	10.6	115	12.0	$p > 0.05$
2. Two measures	102	31.9	156	24.3	258	26.8	$p < 0.05$
3. Three-five measures	139	43.4	350	54.6	489	51.9	$p < 0.05$
4. Six-eleven measures	11	3.4	50	7.9	61	6.3	$p < 0.05$
		93.4		97.3		96.0	$p < 0.01$
5. Don't know	21	6.6	17	2.7	38	4.0	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 10. Places flies born.

Flies born at insanitary places, pigpens, human and animal excreta, animal corpses, wastes, etc. Table 12 show that 93.8% pupils at case schools knew 1-6 places flies born, it was 86.9% at control schools. The difference is significant with  $p < 0.001$ . Most people know 2 places (36.9%). Particularly, 8.5% didn't know any. Pupil knew 3 or 4-6 places at control schools was lower than case. The difference is significant with  $p < 0.05$ .

**Table 12: Knowledge of pupils about places where flies born**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One place	106	33.1	173	27.0	279	29.0	$p < 0.05$
2. Two places	115	35.9	240	37.4	355	36.9	$p > 0.05$
3. Three places	39	12.2	126	19.7	165	17.2	$p < 0.05$
4. Four-six places	18	5.7	62	9.7	80	8.3	$p < 0.05$
		86.9		93.8		91.5	$p < 0.001$
5. None	42	13.1	40	6.2	82	8.5	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 11. Source of information

Results of interviews with structured questionnaire, in-depth interviews and group discussions are presented in table 13.



**Table 13: Source of information for pupils on environmental sanitation and control of worm infection.**

Answer	School	No sanitation facility		Facility available		Total		p>0.05
		N	%	n	%	n	%	
1. Teachers, health education at schools		267	83.4	537	83.8	804	83.7	
2. Others: mass media, health staffs, relatives		53	16.6	104	16.2	157	16.3	
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

Primary school children learn about environmental sanitation and control of worm infection from schools, mainly through health education (83.7%). Others are mass media (TV, radio, newspaper, communal loudspeakers), parents and relatives, health staffs, friends (16.3%). The difference between pupils at case and control schools is not significant with  $p>0.05$ .

Survey on pupils at 24 schools revealed that:

Pupils had good knowledge on environmental sanitation and control of worm infection. This can be explained that health education is taught at all schools. Schools had an important role in disseminating information on personal hygiene, environmental sanitation to pupils. Pupils receive most information from schools.

Results revealed that rate of pupils knew about environmental sanitation and control of worm infection at case schools was significantly higher than at control schools, e.g. knowledge on types of sanitary latrines, safe water for drinking, boiling water before drinking, diseases caused by contaminated water, causes of worm infection, measures to prevent worm infection, places flies born. More pupils know thoroughly about environmental sanitation at case schools than at control schools.

Although pupils at the two groups of schools all learn health education. At case schools, pupils use sanitation facilities, extra-curriculum activities on environmental sanitation, personal hygiene, etc are organised. All those have positively influenced knowledge, attitude on environmental sanitation and control of worm infection of pupils, their parents, teachers and gradually change their practices.

## 12. Attitude of pupils

Attitude of pupils at two groups of schools toward environmental sanitation and control of worm infection are presented below.

**Table 14: Attitude of pupils toward health education at schools.**

Answer	School	No sanitation facility		Facility available		Total	
		n	%	n	%	n	%
1. Like		320	100.0	641	100.0	961	100.0
2. Dislike		0	0.0	0	0.0	0	0.0
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>

Health education is provided at primary schools nation-wide and also at 24 schools under the survey. All pupils said they was interested in this subject (100%), as it is necessary and useful, 88.7% pupils talked to their parents about this subject.

**Table 15: The nessecity of school sanitation facilities of pupils.**

Answer	School	No sanitation facility		Facility available		Total	
		n	%	n	%	n	%
1. Yes		320	100.0	641	100.0	961	100.0
2. No		0	0.0	0	0.0	0	0.0
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>

Table 15 show that 100% pupils said that the facilities were necessary, 90.4% to keep hygiene, 5.3% to avoid diseases, 4.3% other reasons.

**Table 16: Pupils talk to parents about needs for sanitation facilities at schools**

Answer	School	No sanitation facility		Facility available		Total		p
		n	%	n	%	n	%	
1. Yes		185	57.8	455	71.0	640	66.6	p<0.001
2. No		124	38.8	154	24.0	278	28.9	
3. Don't remember		11	3.4	32	5.0	43	4.5	
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

Table 16 show that 66.6% pupils talked to their parents about needs for sanitation facilities at schools, 71.0% at case schools and 57.8% at control schools. The difference is significant with  $p < 0.001$ . It was also revealed that 95.0% pupils at schools where sanitation facilities available told their parents about the facilities.

Interviewing the pupils, it was found that rate of sanitary latrines at home of pupils at case communes was 77.8% (499/641), 55.0% (176/320) at control schools. The difference is significant with  $p < 0.001$ . Needs for sanitary latrines at home of pupils are presented below:

**Table 17: Needs of pupils for sanitary latrines at home.**

Answer \ School	No sanitation facility		Facility available		Total		$p < 0.001$
	n	%	n	%	n	%	
1. Yes	107	74.3	136	95.8	243	85.0	$p < 0.001$
2. No, no answer	37	25.7	6	4.2	43	15.0	
<b>Total</b>	<b>144</b>	<b>100.0</b>	<b>142</b>	<b>100.0</b>	<b>286</b>	<b>100.0</b>	

85% pupils at case schools replied they wanted to build sanitary latrines at home, 95.8% at the case and 74.3% at control schools. The difference is significant with  $p < 0.001$ . Schools sanitation facilities encourage the needs for sanitation facilities at home of pupils.

Asking the pupils wishing to build sanitary latrines at home if they talked to their parents, 77.9% (106/136) pupils at case schools talked to their parents about their needs, 57.9% (62/107) at control schools. The difference is significant with  $p < 0.01$ .

**Table 18: Pupils' needs for sanitary latrines at home by their parents**

Answer \ School	No sanitation facility		Facility available		Total		$p < 0.001$
	n	%	n	%	n	%	
1. Yes	102	31.9	285	45.5	387	40.9	$p < 0.001$
2. No	202	63.1	306	48.9	508	53.7	
3. Don't remember	16	5.0	35	5.6	51	5.4	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

By the parents, 40.9% pupils talked to their parents about need for sanitary latrines at home. As for pupils didn't talk (53.7%), these include pupils already had sanitary latrines at home. Rate pupils talked to parents at case school was 45.5%, 31.9% at control. The difference is significant with  $p < 0.001$  (Table 18). In the previous section, the rate was 95.8% and 74.3%. The difference is significant with  $p < 0.001$ .

## B2. PRACTICES OF PUPILS ON ENVIRONMENT SANITATION, CONTROL OF WORM INFECTION

961 pupils was interviewed about their environmental sanitation, control of worm infection practices. Data are presented below:

### 1. Defecation outside latrines

9% said they regularly or sometimes defecate at road sides, gardens, fields, this means they didn't know about harms of this or latrines at schools not available or too dirty. 91% pupils never had defecation outside latrines, 92.5% at case schools, 88.1% at control school. The difference is significant with  $p < 0.05$ .

Table 19: Defecations outside latrines.

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Never	282	88.1	593	92.5	875	91.0	p<0.05
2. Sometimes	22	6.9	27	4.2	49	5.1	
3. Regularly	16	5.0	21	3.3	37	3.9	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 2. Handwash before meals

Survey at 24 schools reveal that 99.7% pupils (958/961) said it was necessary to wash hand before meals. This rate was similar between case and control schools yet there were differences in practising.

Table 20: Handwash before meals.

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Regular	246	76.9	572	89.2	818	85.1	p<0.001 p<0.001
2. Sometimes	71	22.2	66	10.3	137	14.3	
3. Never	3	0.9	3	0.5	6	0.6	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

85.1% pupils practised handwash before meals, 89.2% at case schools and 76.9% at control schools. The difference is significant with  $p < 0.001$ . Pupils sometimes wash hand at control schools was significantly higher ( $p < 0.001$ )

53.4% (342/641) pupils hand wash with soap at case schools was significantly higher than 37.2% (119/320) at control schools. The difference is significant with  $p < 0.001$ .

### 3. Handwash after defecation.

Results show that 98.5% (947/961) pupils perceived the necessity of handwash after defecation. There was no significant difference between case and control schools.

Table 21 show that 87.8% pupils at case schools often wash hand after defecation, 73.1% at control schools. The difference is significant with  $p < 0.001$ .

**Table 21: Handwash after defecation.**

Answer \ School	No sanitation facility		Facility available		Total		p<0.001
	n	%	n	%	n	%	
1. Regularly	234	73.1	563	87.8	797	82.9	
2. Sometimes	79	24.7	70	10.9	149	15.5	
3. Never	7	2.2	8	1.2	15	1.6	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

Similarly, pupils wash hand with soap at case schools (52.4%) also significantly higher than at control school (36.6%). The difference is significant with  $p < 0.001$ .

### 4. Fly prevention at home

Rate of pupils at case schools practised measures to prevent flies was 97.1%, 98.3% at case schools and 94.7% at control schools. The difference is significant with  $p < 0.01$ . One measure at control schools was higher (46.6% vs. 37.1%), two measures was significantly lower with  $p < 0.01$  (40.3% vs. 50.0%)

**Table 22: Practices to prevent flies at home of pupils**

Answer \ School	No sanitation facility		Facility available		Total		p<0.01 p<0.01 p>0.05 p<0.01
	n	%	n	%	n	%	
1. One measure	149	46.6	238	37.1	387	40.3	
2. Two measures	129	40.3	320	50.0	449	46.7	
3. Three measure	25	7.8	72	11.2	97	10.1	
		94.7		98.3		97.1	
4. None	17	5.3	11	1.7	28	2.9	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

## 5. Drinking unboiled water

Table 23 show that 90.0% pupils never drink unboiled water, 93.3% at case schools and 86.6% at control. The difference is significant with  $p < 0.001$ . Nevertheless, 10% sometimes and often drink unboiled water which is a cause of diarrhoea. Education on environment sanitation should be strengthened.

**Table 23: Pupils drink unboiled water**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Often	9	2.8	12	1.9	31	3.2	p<0.001
2. Sometimes	34	10.6	31	4.8	65	6.8	
3. Never	277	86.6	598	93.3	865	90.0	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

## 6. Pupils care about hygienic behaviours of other family members

### 6.1. Handwash before meals or after defecation

Children care much about hygienic behaviours of adults. It is shown in table 24 that 94.4% children care about hand wash before meals and after defecation of other family members, 95.9% at case schools, 91.2% at control. The difference is significant with  $p < 0.05$ .

**Table 24: Pupils care about handwash before meals, after defecation of family members**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Care	292	91.2	615	95.9	907	94.4	p<0.05
2. Don't care	28	8.8	26	4.1	54	5.6	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

Children care much about sanitary behaviours of others, 63.3% pupils at case schools reported that their families members wash their hand before meals, 55.7% after defecation. The corresponding rates at control schools are 52.5% & 46.3% respectively. The difference is significant with  $p < 0.001$ .

### 6.2. Drinking unboiled water

Table 25 show similar responses of pupils at case and control schools when they noticed other family members drink unboiled water. Positive responses i.e. advice to drink boiled water or boil the water themselves was 91.1% at case schools which is higher than at control schools (88.7%). The difference is not significant with  $p > 0.05$ .

**Table 25: Responses of pupils when family members drink unboiled water.**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Advise them to use boiled water	280	87.5	571	88.1	851	89.0	p>0.05
2. Boil water themselves	4	1.2	19	3.0	23	2.0	
		88.7		91.1		91.0	
3. No response	36	11.3	51	8.9	87	9.0	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 6.3. Eating raw vegetables

Table 26 show that 91.6% pupils at case schools had positive response when they noticed raw vegetables, i.e. advice to clean the vegetables thoroughly, clean the vegetables themselves, 86.6% at control schools. The difference is not significant with  $p>0.05$ . Rate pupils eating raw vegetables at control schools is significantly higher than case schools with  $p<0.05$  (13.4% vs. 8.4%)

**Table 26: Pupils response to eating raw vegetables.**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Don't eat	55	17.2	139	21.7	194	20.2	p>0.05
2. Advice to clean vegetables thoroughly before eating	206	64.4	400	62.4	606	63.1	p>0.05
3. Clean the vegetables themselves	16	5.0	48	7.5	64	6.6	p>0.05
		86.6		91.6		89.9	
4. Eat the vegetables	43	13.4	54	8.4	97	10.1	p<0.05
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 7. Pupil participate in sanitation activities at communities

Apart from participating in sanitation activities at schools, pupils also participate in information campaign and cleaning activities at villages under direction of local authorities and teachers. These activities reflect the positive affects of health/hygiene education at schools.

### 7.1. Propaganda on sanitation

The primary school pupils are young, not capable for sanitation propaganda at villages. This is usually conducted by schools and local authorities. Rate of pupils participated in the propaganda was 34.8%, 37.0% at case schools and 30.3% at control schools. The difference is significant with  $p < 0.05$ .

**Table 27: Pupils' participation in sanitation propaganda at villages.**

Answer \ School	No sanitation facility		Facility available		Total		p < 0.05
	n	%	n	%	n	%	
1. Yes	97	30.3	237	37.0	334	34.8	
2. No	223	69.7	404	63.1	627	65.2	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 7.2 Pupils participate in cleaning activities at villages

Table 28 show that 77.9% pupils at case schools replied that they participated in cleaning activities at villages, 27.8% often participated, the corresponding rate was 56.2% and 18.4% at control schools. The difference is significant with  $p < 0.01$ .

**Table 28: Pupils' participate in cleaning activities at villages**

Answer \ School	No sanitation facility		Facility available		Total		p < 0.01
	n	%	n	%	n	%	
1. Often	59	18.4	178	27.8	237	25.0	
2. Sometimes	121	37.8	321	50.1	442	46.0	
		56.2		77.9		71.0	p < 0.01
3 Never	140	43.8	142	22.1	282	29.0	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>641</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 7.3. Inspections on usage, maintenance of school sanitation facilities

The sanitation facilities at primary schools provided by UNICEF are septic latrines. Alongside with interviews, investigators also observed sanitary and technical conditions of sanitation facilities at 16 case schools.

Sanitation facilities provided by UNICEF are being effectively operated and utilised. Interviewing pupils at 16 schools with sanitation facilities, 80.3% used the facilities daily (water passing, defecation and handwash), 100% often received regulations for use of facilities, 96.2% properly applied the regulations to keep hygiene and preserve the facilities. In some schools, workers were



employed to clean the facilities, pupils sometimes took part in cleaning the facilities for personality education. Hence, only 48.0% pupils often participated and 42.9% sometimes.

**Table 29: Inspections on technical and sanitary conditions of the facilities.**

No.	Indicator	Total	%
1	Clean sanitary facilities	12/16	75.0
	Sanitation facilities not clean	4/16	25.0
2	Enough water for flushing	12/16	75.0
	Lack of water	4/16	25.0
3	Door flaps sufficient	14/16	87.5
	Doors flaps insufficient	2/16	12.5
4	Enough waste paper bin	12/16	75.0
	Waste paper bin insufficient	4/16	25.0
5	Enough water containers for flushing	13/16	81.3
	Not enough	3/16	18.7
6	Latrine's flooring in good condition	14/16	87.5
	Some latrine's flooring broken	2/16	12.5
7	No latrine obstructed	13/16	81.3
	Some latrines blocked	3/16	18.7
8	Waste water discharged rapidly	12/16	75.0
	Waste water stagnant and dirty	4/16	25.0
9	Latrines usually utilised	15/16	93.7
	Latrines rarely utilised	1/16	6.3

Results revealed that 93.7% facilities were often utilised, serving pupils and teachers. As for sanitary and technical conditions, 75% facilities were acceptable. In most schools, there were only 2 latrines, one for boys & one for girls, not enough for users. Electric pumps were installed in some schools, while hand pumps were used for most schools, some pumps were out of order. The shortcomings encountered were insufficient water for handwash due to broken water supply system or taps, in some instances, handwash area was not available.

The shortcomings in term of technical or sanitary conditions mainly came from poor management from school leaders.

Nevertheless, if we consider school sanitation facilities as public facilities with great number of users, the conditions were precisely reflected and acceptable. If there were no school sanitation facilities or old type facilities, the sanitary conditions at schools would be much worse.

Together with health education, school sanitation facilities had remarkable influences in changing perceptions of pupils on water and environmental sanitation and control of worm infection. From these changes, pupils had positive personal hygienic, environment sanitation practices and affect their parents; community.

### C. KNOWLEDGE, ATTITUDE AND PRACTICES OF PUPILS' PARENTS ON ENVIRONMENT SANITATION AND CONTROL OF WORM INFECTION.

At the 24 communes, 946 pupil's parents were interviewed (320 at communes where school sanitation facility available and 626 at communes where school sanitation facility not available). Among those, 51.8% male and 48.2% female, most of them were farmers (70.9%), most families had enough food (87.5%). In general, the two groups are similar. Data are presented in table 30.

**Table 30: Some data about pupils' parents.**

Parents at schools	No sanitation facilities		Facilities available		Total	
	n	%	n	%	n	%
1. Gender						
- Male	151	47.2	329	54.1	490	51.8
- Female	169	52.8	287	45.9	456	48.2
2. Occupation						
- Farmers	238	74.4	433	69.2	671	70.9
- Handicrafts	10	3.1	21	3.4	31	3.3
- Retirees	24	7.5	46	7.3	70	7.4
- Teachers	18	5.6	29	4.6	47	4.9
- Others	30	9.4	97	15.5	127	13.5
3 Living conditions						
- Prosperous	10	3.1	23	3.7	33	3.5
- Enough food	17	5.3	68	10.8	85	9.0
- Food shortage	293	91.6	535	85.5	828	87.5
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>

Results of KAP survey are presented below:

## C1. KNOWLEDGE OF PUPILS' PARENTS

### 1. Types of sanitary latrines

In general, most parents could tell at least 1 type of sanitary latrine (96.4%), 97.6% at case schools and 94.1% at control schools. The difference is significant with  $p < 0.01$ . Parents know 2-4 types of sanitary latrines at case school is higher than at control schools (33.4% vs. 26.6%). The difference is significant with  $p < 0.05$ . (Table 31)

**Table 31: Knowledge on types of sanitary latrines**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One type	216	67.5	404	64.5	620	65.6	$p < 0.05$
2. Two-four	85	26.6	207	33.4	292	30.8	
		94.1		97.6		96.4	$p < 0.01$
3 None	19	5.9	15	2.4	34	3.6	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 2. Source of safe water

Table 32 show that most parents could tell at least one source of sanitary water. Rate of parents could tell 3-4 sources at case schools is significantly higher than at control schools with  $p < 0.05$  (20.8% vs. 13.7%)

**Table 32: Knowledge of parents' on safe water**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One type	163	50.9	274	43.8	437	46.2	$p < 0.05$
2. Two types	113	35.3	222	35.4	335	35.4	$p > 0.05$
3. Three-four	34	13.7	130	20.8	174	18.4	$p < 0.001$
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

### 3. Diseases caused by contaminated water

Rate of parents could tell at least one disease caused by contaminated water at case schools (95.5%) is significantly higher than at control schools (92.2%) with  $p < 0.05$ .

**Table 33: Knowledge of pupil's parents on diseases caused by contaminated water**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One disease	49	15.3	91	14.5	140	14.8	$p > 0.05$
2. Two-four diseases	211	65.3	446	71.2	657	69.4	$p > 0.05$
3. Five-seven diseases	37	11.5	61	9.7	9.8	10.3	$p > 0.05$
		92.2		95.5		94.4	
4. None	25	7.8	28	4.5	53	5.6	$p < 0.05$
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

### 4. Causes of worm infection

97.1% parents at case schools knew at least one cause of worm infection, 91.6% at control school. The difference is significant with  $p < 0.001$ . Differences in rate of 1, 2-4 causes; 5-7 causes are not significant.

**Table 34: Knowledge of parents on causes of worm infection**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One cause	44	13.8	88	14.5	132	14.0	$p > 0.05$
2. Two-four causes	214	66.8	448	71.6	662	69.9	$p > 0.05$
3. Five-seven causes	35	10.9	72	11.5	10.7	11.3	$p > 0.05$
		91.6		97.1		95.2	
4. None	27	8.4	18	2.9	45	4.8	$p < 0.001$
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

### 5. Harms of worm infection

Table 35 show that parents 94.3% parents could tell at least one harm of worm infection, it was 96.0% at case schools and 90.9% at control schools. The difference is significant with  $p < 0.01$ . Difference in rate of 1-3 or 4-5 harms are not remarkable.

**Table 35: Knowledge of parents on harms of worm infection**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One-three harms	266	83.1	54.1	86.4	807	85.3	p>0.05 p>0.05 p<0.01
2. Four-five harms	25	7.8	60	9.6	85	9.1	
		90.9		96.0		94.3	
3. None	29	9.1	25	4.0	54	5.7	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

### 6. Control of worm infection

Most parents could tell at least one measure to prevent worm infection (98.3%), it was 99% at case schools and 96.9% at control schools. The difference is significant with  $p < 0.05$ . There was minor difference in other rates.

**Table 36: Knowledge on parents on measures to prevent worm infection**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. One measure	17	5.3	40	6.4	57	6.0	p>0.05 p>0.05 p>0.05 p>0.05 p>0.05 p<0.05
2. Two measures	60	18.8	125	20.0	185	19.6	
3. Three measures	97	30.3	152	24.3	249	26.3	
4. Four measures	66	20.6	142	22.7	208	22.0	
5. Five-eight measures	74	23.1	161	25.0	235	24.8	
		96.9		99.0		98.3	
6. None	10	3.1	6	1.0	16	1.7	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

### 7. Places flies born

Most people know at least place flies born (78.7%). Rate parents know at least one place is 94.5%, it was 95.6% at case schools and 92.2% at control schools. The difference is significant with  $p < 0.05$ . (Table 37)

**Table 37: Knowledge of pupil's parents on places where flies born**

Answer \ School	Sanitation facility available		No sanitation facility		Total		
	n	%	n	%	n	%	
1. One-three places	249	77.8	496	79.2	754	78.7	p>0.05 p>0.05 p<0.05
2. Four-six places	46	14.3	103	16.4	149	15.8	
		92.2		95.6		94.5	
3. None	25	7.8	27	4.4	52	5.5	
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

The survey at 24 communes show that:

- Pupils' parents had good knowledge of on environmental sanitation and control of worm infection of pupil's parents. This can be explained that environment sanitation program has been conducted in these communes by the Ministry of Health and UNICEF in recent years. People have received information through different channels.

- Comparing between the two groups of pupils' parents, results also show that parents at case schools had better knowledge on environmental sanitation and control of worm infection, e.g. knowledge on types of sanitary latrines, safe water, disease caused by contaminated water, causes of worm infection, control of worm infection, places flies born. This means the information has been transferred to families, community.

## 8. Sources of information

### 8.1. Sources of information on environmental sanitation and control of worm infection

At communes where UNICEF supported school sanitation facilities available, there are various positive sources of information for pupil's parents (Table 38).

**Table 38: Main sources of information on environment sanitation and control of worm infection for pupil's parent**

Answer \ School	No sanitation facility		Facility available		Total		
	n	%	n	%	n	%	
1. Schools	46	14.4	124	19.8	170	18.0	p<0.05
2. Children	75	23.4	196	31.3	271	28.6	p<0.05
3. Local authorities	33	10.3	55	8.8	88	9.3	p>0.05
4. Mass media	130	40.6	220	35.5	350	37.0	p>0.05
5. Others	36	11.3	31	4.6	67	7.1	p<0.001
<b>Total</b>	<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

Table 38 show that mass media is the most important source of information for pupils' parents about issues on environmental sanitation and control of worm infection, e.g. TV, radio, newspaper, communal loudspeakers (37%), their children (28.6%), schools (18%). As for information from their children and school, this source is greater at schools where UNICEF supported school sanitation facilities available than at schools with no UNICEF facilities (31.3% vs. 23.4%, 19.8% vs. 14.4%). The difference is significant with p<0.05. As for other sources (relatives, neighbours), the difference is not significant.

In-depth interviews and focus group discussions of pupils' parents revealed that most parents received information on personal hygiene, school sanitation and environmental sanitation from teachers as the teachers often talk about this during meetings of pupil's parents. Children told their parents or the parents look at books of their children. Schools, including teachers and pupils, teaching and learning process, social relations had great role in disseminating hygiene information and in community mobilisation.

Ms. Chu Thi Van, pupil parent in Xuan Hong primary school (Xuan Truong, Nam Dinh) said *"I check homework of my children everyday, including exercises of health education subject. I realised that our children received much useful information from this subject, and so did we"*. Mr. Pham Luoc said *"Children told us about sanitation facilities at schools. Before, children defecate in prohibited places, when they attend 1<sup>st</sup> grade, they knew to defecate at regulated places"*

Parents have close relations with teachers, particularly in term of health care for their children. Mr Pham Luoc said *"I participate in pupils' parents association and I check sanitation facilities every week, together with the teachers. If we find any problem, we'll discuss to solve it"*

As knowledge on environment sanitation closely relate to reality, lessons of children had immediate effects on their families. *"The difference between health education and other subjects is that our children ask parent to practice what they have learnt, e.g. to build sanitation facilities, use safe water. We don't have water sealed latrines, he use latrines of grandparents as there's a water sealed latrine, he also said that it was clean to defecate at water sealed latrines"* (Mr. Vu Van Chien, pupil's parent at Xuan Ngoc school, Xuan Truong, Nam Dinh).

Thanks to the influences between families members, information from pupils could be transferred to others and gradually change their knowledge.

### 8.2 Source of information on school sanitation facilities

Interviewing 626 parents at case schools revealed that 69.6% pupils told their parents about the sanitation facilities at schools, 30.4% didn't told or not remember. In reality, number of children telling their parents about the facilities could be greater because only one person/family was interviewed. As reported by the parent, children's opinion about the facilities: 73.6% praise, 9.4% criticise, 8.3% both praise and criticise, 8.7% no comments (Table 39).

**Table 39: Information about school sanitation facilities from pupils to parents.**

Parents heard from their children		Children's opinion (436 pupils)							
		Praise		Criticise		Both		No comment	
n	%	n	%	n	%	n	%	n	%
436/626	69.6	321	73.6	41	9.4	36	8.3	38	8.7

**Table 40: Information about school sanitation facilities parents received from schools.**

From teachers (626 parents)		Direct observation (626 parents)	
n	%	n	%
583	93.1	409	65.3

Table 40 show that Data show that 93.1% parents at case schools heard about the facilities from teachers, the rest of 6.9% parents didn't regularly attend school meetings. 65.3% parents came to observe the facilities.

## C2. ATTITUDE AND PRACTICES OF PARENTS

Interviews were conducted for 946 pupils' parents on their attitude and practices on environmental sanitation and control of worm infection. Data are presented below:

### I. Necessity of sanitation facilities

**Table 41: Parents' opinion about necessity of school sanitation facilities**

Answer	School	No sanitation facility		Facility available		Total	
		n	%	n	%	n	%
1. Yes		320	100.0	626	100.0	946	100.0
2. No		0	0.0	0	0.0	0	0.0
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>

About the school sanitation facilities, all parents at case and control schools considered the facilities necessary (Table 41)

**Table 42: Opinions of pupils' parents about school sanitation facilities should be constructed**

Answer	School	No sanitation facility		Facility available		Total	
		n	%	n	%	n	%
1 Yes		311	97.2	626	100.0	937	99.0
2 No		0	0.0	0	0.0	0	0.0
3. Don't know		9	2.8	0	0.0	9	1.0
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>

All parents at case schools replied that it was necessary to build school sanitation facilities. They all said that they didn't have to contribute money for



construction of the facilities, only a sum for general construction; including payments for cleaning workers. About purposes of the facilities, 95% to keep hygiene, 2.1% to prevent diseases, 2.9% didn't know.

97.2% parents at control schools considered school sanitation facilities should be constructed, no one protest while 2.8% hesitate. About reason of hesitation, the main was economic, some parents dint's want to contribute money for construction of the facilities.

About contribution for the facilities, 96.1% parents at control schools willing to contribute, the rest of 3.9% couldn't contribute due to difficult family economic condition. About place to defecate when children at schools, 54.5% parents at control schools said that children defecate at the old latrines, 32.0% came home or use latrines of families near schools, the rest of 13.5% defecate outside latrines. This rate is similar to rate of defecation outside latrines revealed through pupil's interviews (11.9%). This means parents care much about conditions of their children at schools.

## 2. Latrines at home of pupils' parents

Interviewing 946 pupils' parents, rate household had latrines at home was 93%, it was 93.5% at case schools and 92.2% at control. The difference is not significant with  $p>0.05$  (Table 43)

Table 43: Households of pupils with latrines at home

Answer	School	No sanitation facility		Facility available		Total		p>0.05
		n	%	n	%	n	%	
1. Yes		295	92.2	585	93.5	880	93.0	
2. No		25	7.8	41	6.5	66	7.0	
<b>Total</b>		<b>320</b>	<b>100.0</b>	<b>626</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>	

Table 44: Sorts of latrines at home of pupils

Answer	School	No sanitation facility		Facility available		Total		p<0.001
		n	%	n	%	n	%	
1. Water sealed (septic, Sulabh)		29	9.9	86	14.7	115	13.1	
2. Two tanks		23	7.8	146	25.0	169	19.2	
3. Improved dug		3	1.0	9	1.5	12	1.4	
			18.7		41.2		33.7	
4. Other, not sanitary		240	81.3	344	58.8	584	66.3	
<b>Total</b>		<b>295</b>	<b>100.0</b>	<b>585</b>	<b>100.0</b>	<b>880</b>	<b>100.0</b>	

Table 44 show that 18.7% households of pupils at control school had sanitary latrines, 41.2% at case schools. The difference is significant with  $p < 0.001$ . Interviewing the pupils, the rate was 77.8% and 55.0% respectively ( $p < 0.001$ ).

### 3. Sanitary practices

Table 45 show that practices on personal hygiene, environmental sanitation and control of worm infection of parents at case schools are much better than those at control schools. All the differences are significant (except taking de-worming pills)

**Table 45: Practices on personal hygiene, environmental sanitation, control of worm infection at families of pupils.**

Answer	Parents at schools		Facilities available (626)		
	No sanitation facilities (320)		Facilities available (626)		
	n	%	n	%	
1. No use incubated excreta	202	63.1	446	71.2	$p < 0.05$
2. Never drink unboiled water	253	79.1	538	85.9	$p < 0.01$
3. Regular handwash before meals & after defecation	170	53.1	386	61.7	$p < 0.05$
4. Regular handwash with soap	78	24.4	200	31.9	$p < 0.05$
5. Apply measures to prevent flies	297	92.8	613	97.9	$p < 0.01$
6. Families members took de-worming pills in last 6 months	215	67.2	453	72.4	$p > 0.05$

**D. KNOWLEDGE, ATTITUDE, PRACTICES OF ADULTS WITHOUT CHILDREN CURRENTLY ATTENDING PRIMARY SCHOOLS ON ENVIRONMENT SANITATION, CONTROL OF WORM INFECTION**

At the 24 communes, 961 people was interviewed, 324 with children attending control schools, 637 at case schools. With regard to gender, 52.8% male and 47.2% female, most of them were farmers (65.7%), most of them had enough food (91.1%).

**Table 46: Community members took part in the interviews**

School Answer	No sanitation facility		Facility available		Total	
	n	%	n	%	n	%
1. Gender						
- Male	154	47.5	34	55.6	508	52.8
- Female	170	52.5	83	44.4	453	47.2
2. Occupation						
- Farmers	214	66.1	417	65.5	631	65.7
- Handicraft	12	3.7	25	3.9	37	3.9
- Retirees	59	18.2	103	16.2	162	16.8
- Teachers	12	3.7	22	3.5	34	3.5
- Businessperson	5	1.5	22	3.5	27	2.8
- Others	22	6.8	48	7.6	70	7.3
3. Living conditions						
- Prosperous	6	1.9	20	3.1	26	2.7
- Enough food	296	91.3	579	90.9	875	91.1
- Food shortage	22	6.8	38	6.0	60	6.2
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>

Results of KAP survey are presented below:

**D1. KNOWLEDGE**

**1. Sanitary latrines**

Table 47 show that 97% community members at communes with case schools knew at least one type of sanitary latrines, two-four types 34.4%. The corresponding rates are 84.9% and 22.8% for the control. The difference is significant with  $p < 0.001$ .

**Table 47: Knowledge of community about types of sanitary latrines**

Answer	Parents	No sanitation facility		Facility available		Total		
		n	%	n	%	n	%	
1. One type		201	62.0	399	62.6	600	62.4	p<0.001
2. Two-four types		74	22.9	214	34.4	293	30.5	
			84.9		97.0		92.9	
3. Wrong answer, don't know		49	15.1	19	3.0	68	7.1	
<b>Total</b>		<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

## 2. Safe water

Most people knew at least one source of safe water (99.7%), this rate was equal between case and control schools. Rate of community members knew 2 sources of safe water at communes with case schools is higher than control (37.2% vs. 33.3%). The difference is not significant.

**Table 48: Knowledge of community members on safe water.**

Answer	Parents	No sanitation facility		Facility available		Total		
		n	%	n	%	n	%	
1. One type		165	50.9	298	46.8	463	48.2	p>0.05
2. Two types		108	33.3	237	37.2	345	35.9	
3. Three types		49	15.2	101	15.9	150	15.6	
			99.4		99.8		99.7	
4. None		2	0.6	1	0.2	3	0.3	
<b>Total</b>		<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

## 3. Diseases caused by contaminated water

Table 49 show high rate of community members know about disease caused by contaminated water (87.9%), this rate at case communes is higher than at control (92.9% vs. 78.1%), particularly is the rate of two diseases or more (79.9% vs. 62.9%). The difference is significant with p<0.001.

**Table 49: Knowledge on diseases caused by contaminated water.**

Answer	Parents	No sanitation facility		Facility available		Total		
		n	%	n	%	n	%	
1. One disease		49	15.2	83	13.0	132	13.7	p<0.001
2. Two or more		204	62.9	509	79.9	713	74.2	
			78.1		92.9		87.9	
3. None		71	21.9	45	7.1	116	12.1	
<b>Total</b>		<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

#### 4. Causes of worm infection

Table 50 show that 95.3% community members know about causes of worm infection, it was 96.2% at case community and 93.5% at control. Rate of community members at case community knew 2 causes or more is high than control (85.2% vs. 81.8%). The difference is not significant.

Table 50: Knowledge on causes of worm infection

Answer	Parents	No sanitation facility		Facility available		Total		
		n	%	n	%	n	%	
1. One cause		38	11.7	70	11.0	108	11.2	p>0.05
2. Two or more		265	81.8	543	85.2	808	84.1	
			93.5		96.2		95.3	
3. None		21	6.5	24	3.8	45	4.7	
<b>Total</b>		<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

#### 5. Harms of worm infection

Table 51 show that 93.6% community members know at least one harm of worm infection, it was 94% at case and 92.6% at control. The difference is not significant with p>0.05.

Table 51: Knowledge on harms of worm infection

Answer	People	Control community		Case community		Total		
		n	%	n	%	n	%	
1. One harm		97	29.9	168	26.4	265	27.6	p>0.05
2. Two or more		203	62.7	431	67.7	634	66.0	
			92.6		94.0		93.6	
3. None		24	7.4	38	6.0	62	6.4	
<b>Total</b>		<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

#### 6. Measures to control worm infection

Most people of the two community groups knew at least 1 measure to control worm infection (94.2%). It was higher at case community than at control (97% vs. 88.6%). The difference is significant with p<0.001. Moreover, rate people at case community know 4 measures or more is higher than at control (43% vs. 32.1%). The difference is significant with p<0.001 (Table 52).

**Table 52: Knowledge on measures to control worm infection**

Answer \ People	Control community		Case community		Total		
	n	%	n	%	n	%	
1. One-three	183	56.5	342	54.0	525	54.6	p<0.001 p<0.001
2. Four or more	104	32.1	276	43.0	380	39.6	
		88.6		97.0		94.2	
3. None	37	11.4	19	3.0	56	5.8	
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 7. Places flies born

93.2% community members at communes with case schools knew at least one place flies born, it was 95.1% at case and 89.5% at control. The difference is significant with  $p<0.05$  (Table 53).

**Table 53: Knowledge of people on places flies born**

Answer \ People	Control community		Case community		Total		
	n	%	n	%	n	%	
1. One-six	290	89.5	606	95.1	896	93.2	p<0.05
2. None	34	10.5	31	4.9	65	6.8	
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 8. Source of information

As for adults with no children attending primary schools, information still came from schools to community through propaganda conducted by schools, relations between teachers and community, especially information from pupils. It was shown in table 54 that this rate was 21.5% at case schools, 7.1% for control. The difference is significant with  $p<0.001$ . Mass media took the largest proportion (36.5%) and equal between the two groups. Information from health staffs or local authorities at control community is significantly higher than case with  $p<0.001$  (31.2% vs. 15.4%).

**Table 54: Source of information on environmental sanitation, control of worm infection for community members**

People Answer	Control community		Case community		Total		
	n	%	n	%	n	%	
Schools & pupils	23	7.1	137	21.5	160	16.6	p<0.001
Pupil's parents	75	23.1	153	24.0	228	23.7	p>0.05
Local authorities, health staffs	101	31.2	98	15.4	199	20.7	p<0.001
Mass media	116	35.8	234	36.7	350	36.5	p>0.05
Others	9	2.8	15	2.4	24	2.5	p>0.05
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

Interviewing 637 adults at community with school sanitation facilities, 88.4% (563/637) replied that they knew about the facilities at schools. Among the respondents knew about the facilities, 65.4% heard from communal announcements, 32.3% heard from pupils and pupils' parents, 2.3% saw the facilities themselves or other sources at community.

## D2. ATTITUDE & PRACTICES

### 1. The necessity of school sanitation facilities

Being asked about the necessity of school sanitation facilities, 98.3% community members at the two groups replied yes. Though people don't have children attending schools, they are aware of the needs of pupils for school sanitation facilities.

**Table 55: Necessity of school sanitation facilities in the opinion of community members.**

People Answer	Control community		Case community		Total		
	n	%	n	%	n	%	
1. Yes	317	97.8	628	98.6	954	98.3	p>0.05
2. No	7	2.2	9	1.4	16	1.7	
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

### 2. Latrines at home of respondents

Table 56 shows that 91.5% households, it was 92.5% at case community and 89.5% for the control. The difference is not significant with p>0.05.

**Table 56: Latrines at home of respondents**

People Answer	Control community		Case community		Total		p>0.05
	n	%	n	%	n	%	
1. Yes	290	89.5	589	92.5	879	91.5	
2. No	34	10.5	48	7.5	82	8.5	
<b>Total</b>	<b>324</b>	<b>100.0</b>	<b>637</b>	<b>100.0</b>	<b>961</b>	<b>100.0</b>	

Table 57 show proportions of different types of latrines at home of respondents. At the case community, 42.3% had sanitary latrines, 35.2% for the control. The difference is significant with  $p < 0.05$ . Particularly, rate of water sealed latrines at case community is higher than at control with  $p < 0.01$  (16.6% vs. 9.3%). This is compliant with results of pupils' parents interviews as presented before.

**Table 57: Types of latrines of respondents**

People Answer	Control community		Case community		Total		p<0.01
	n	%	n	%	n	%	
1. Water sealed (Septic, Sulabh)	27	9.3	98	16.6	125	14.2	p<0.05
2. Two-tanks	73	25.2	139	23.6	212	24.1	
3. Improved dug	2	0.7	12	2.0	14	1.6	
4. Others, not sanitary	188	64.8	340	57.7	528	60.1	
<b>Total</b>	<b>290</b>	<b>100.0</b>	<b>589</b>	<b>100.0</b>	<b>879</b>	<b>100.0</b>	

### 3. Environmental sanitation practices

It was shown in table 58 that practices of personal hygiene, environment sanitation and control of worm infection at community with case schools were all better than the control, e.g. no use untreated excreta, never drink unboiled water, handwash before meals and after defecation. The difference is significant. Differences in handwash with soap, taking de-worming pills in the last 6 months are not significant. This is similar to results of pupil's parents interviews presented in previous sections.



Table 58: Practices on personal hygiene, environmental sanitation, control of worm infection of people interviewed

People Answer	No sanitation facilities (324 respondents)		Facilities available (637 respondents)		
	n	%	n	%	
1- Never use untreated excreta for fertilisation	219	67.6	472	74.1	p<0.05
2- Never drink unboiled water	272	85.0	567	89.0	p<0.05
3- Often wash hand before meals, after defecation	179	55.2	399	62.6	p<0.05
4- Often wash hand with soap	90	27.8	216	33.9	p>0.05
5- Use measures to prevent flies					
6- Family members took de-worming pills in the last six months	279	86.1	593	93.1	p<0.001
	205	63.3	438	68.8	p>0.05

Hence, there was relation between environmental sanitation and control of worm infection KAP of community members, pupils and pupils' parents. In areas where pupils had good KAP, community member had good KAP and vice versa. One of the most important factor is the health education from schools, particularly health education, moreover is the school sanitation facilities.

This was also reflected in group discussions. Mr. Tran Xuan Voi, 68 year old (Xuan Ngoc, Xuan Truong, Nam Dinh) said *"We are old now but we have to remind ourselves, even the children can keep hygiene"*. Mr Mai Thanh Khiet, 62 year old said *"Campaigns are sometime mobilised to clean public places. We always participate in the campaigns and we ourselves should do it"*. Mr Nguyen Chi Quyen, 53 year old said *"This commune used to be seriously polluted. Nowadays, quarterly general cleaning activities are launched by local authorities, schools. It was difficult in the first year, yet nowadays people voluntarily participate. In the past, many people built two-tanks latrines, nowadays many build septic latrines like those at schools"*. Mr. Le Ngoc Dinh (Viet Yen, Bac Giang) concluded *"Schools take leading role in constructing the sanitation facilities"* and that *"school is the starting point for rural sanitation work"*.

## E. DIRECT OBSERVATIONS ON HOUSEHOLDS SANITARY CONDITIONS

The investigators observed sanitation facilities at 1920 households (946 households of pupil's parents, 961 community households), latrines available at 1759 of these (92.2%). Data are presented in table 59 and 60.

**Table 59: Types of latrines at households**

Latrines	Control community		Case community		Total		
	n	%	n	%	n	%	
1. Water sealed (septic, Sulabh)	56	9.6	184	15.7	240	13.6	p<0.001
2. Two-tanks	96	16.4	285	24.3	381	21.6	p<0.001
3. Dug	5	0.9	21	1.8	26	1.5	p>0.05
		26.8		41.8		36.7	p<0.001
4. Others, not sanitary	428	73.2	684	58.2	1112	63.3	p<0.001
<b>Total</b>	<b>585</b>	<b>100.0</b>	<b>1174</b>	<b>100.0</b>	<b>1759</b>	<b>100.0</b>	

Proportion of latrines by observation were similar to answers of respondents. Rate of water sealed latrines by observation was 13.6%, 13.1% by pupil's parents interviews, 14.2% by interviews community group. Likewise, 21.6% two-tank latrines, 19.2% by pupil's parents interviews, 24.1% by interviews community group. Hence, pupil's parent and community group interviews revealed valuable data.

Table 59 show that rate of sanitary latrines among case community was 41.8% vs. 26.8% for community group at control schools. This is compliant with results of interviews. The sanitation practices, reflected in rate of sanitary latrines of community where school sanitation facilities available were better than control community (p<0.001)

**Table 60: Sanitary and technical indicators of household latrines by observations**

Latrines	Schools		Facility available		Total		
	No sanitation facility		n	%	n	%	
1. Sanitary water sealed	23/56	41.1	106/184	57.6	129/240	53.7	p<0.05
2. Sanitary two-tanks	43/96	44.8	128/285	49.6	171/381	44.9	p<0.05
<b>Total</b>	<b>66/152</b>	<b>43.4</b>	<b>234/469</b>	<b>49.9</b>	<b>300/621</b>	<b>48.3</b>	

Technical & sanitary requirements of water sealed latrines are: proper water tank, present water seal, enough water for flushing, waste water bin available, clean, no foul smell, few flies. Rate of sanitary latrines at case community was 57.6%, 41.1% for the control. The difference is significant with  $p < 0.05$ .

Technical and sanitary requirements for two-tank latrines are: the tanks are used in turn, lid present, closed door, enough mixture, no foul smell and few flies. Rate of sanitary two-tank latrines between two groups was equal (49.6% and 44.8%),  $p < 0.05$ .

School sanitation facilities with septic latrines as nuclear bring about changes in behaviours toward latrines, more septic latrines and higher sanitary requirements for septic latrines. No remarkable change in two-tank latrines, the old type of sanitary latrine, was observed.

If we count both the two aforementioned types of sanitary latrines, the number at case community is greater than control (49.9% vs. 43.4%). The difference is not significant with  $p > 0.05$ . This fact, together with high rate of people with poor knowledge on environmental sanitation and control of worm infection, use of untreated excreta (30-40%), rate of insanitary latrines (approx. 50%) at households are the explanations for no difference in infection rate between case and control community.

**Table 61: Observation of household sanitation with checklist**

Sanitary indicator	Households		Facility available		
	No school sanitation facility				
	n	%	n	%	
1. Clean house, kitchen	400/585	68.4	862/1174	73.4	$p < 0.05$
2. Few flies	429/585	73.4	915/1174	77.9	$p < 0.05$
3. Food cover available	468/585	80.0	987/1174	84.1	$p < 0.05$
4. Animal excreta collected	265/473	47.3	648/975	66.5	$p < 0.001$
5. Use safe water	489/585	83.6	1028/1174	87.6	$p < 0.05$

Five indicators to evaluate household sanitary conditions are presented in table 61. Results show the indicators at case community is significantly higher than at control. This is an evidence of changes in sanitary practices of community where school sanitation facilities built.

## F. INTESTINAL WORM INFECTION AMONG PUPILS, WORM EGGS IN SOIL AT SCHOOLS

*3.1 Results of stool and soil examinations at the two schools of Co Phuc (school sanitation facilities available) and Viet Thanh (school sanitation facilities unavailable) at Tran Yen district, Yen Bai province*

Examinations of 204 stool samples at Co Phuc school (105 boys and 99 girls) and 201 stool sample at Viet Thanh school (88 boys and 113 girls), mean age of pupils having stool examinations is 7.8. At the same time, 40 soil samples from school ground were collected, analysed (20 from each school). Results are presented below:

**Table 62: Intestinal worm infection at the two schools**

School	No. of samples	General infection (%)		Ascaris		Trichuris		Hookworm	
		+	%	+	%	+	%	+	%
Co Phuc	204	151	74.0	84	41.2	133	65.2	19	9.3
Viet Thanh	201	149	74.1	75	37.3	84	41.8	69	34.3
p		> 0.05		> 0.05		< 0.001		< 0.001	

Table 62 show no significant difference in general infection rate between the two schools (74% vs. 74.1%,  $p > 0.05$ ). Similarly, there was no significant in infection rate of Ascaris (41.2% vs. 37.3%,  $p > 0.05$ ). Infection rate of Trichuris at Co Phuc school is higher than at Viet Thanh (65.2% vs. 41.8%,  $p < 0.001$ ), infection of Hookworm at Viet Thanh is higher than at Co Phuc (34.3% vs. 9.3%,  $p < 0.001$ )

Examinations also reveal that rate of single infection, infection of two species, three species is 49.7%, 43% and 7.3% at Viet Thanh, the corresponding rate at Co Phuc is 55.7%, 31.5% and 12.8%.

**Table 63: Density of infection at the two primary schools**

Schools	Epg								
	Ascaris			Trichuris			Hookworm		
	Epg	SD	Max	Epg	SD	Max	Epg	SD	Max
Co Phuc	3663	14314	183890	275	472	2590	16	70	740
Viet Thanh	2751	11697	118955	48	110	796	35	82	518
p		> 0.05		< 0.001			< 0.05		

Tables 63 show no significant difference in *Ascaris* infection rate between the two schools ( $p>0.05$ ). Density of infection of *Trichuris* at Co Phuc is higher than at Viet Thanh, the difference is significant with  $p<0.001$ . On the contrary, density of Hookworm at Co Phuc is lower than at Viet Thanh. The difference is significant with  $p<0.05$ .

**Table 64: Heavy infection among pupils**

School	Ascaris	Trichuris	Hookworm
Co Phuc	0.5	0.0	0.0
Viet Thanh	1.0	0.0	0.0

Table 64 show that there was no case of heavy infection of *Trichuris* and Hookworm at both the two schools. Rate of heavy infection of *Ascaris* at Co Phuc and Viet Thanh is 0.5% and 1%.

**Table 65: Worm eggs at school grounds.**

School	No. of samples	Infected		Ascaris		Trichuris	
		% (+)	Eggs/100 gr. of soil	% (+)	Eggs/100 gr. of soil	% (+)	Eggs/100 gr. of soil
Co Phuc	20	95.0	14	95.0	13	65.0	1
Viet Thanh	20	100.0	11	100.0	11	45.0	0.7

Table 65 show that there was no significant difference in *Ascaris*, *Trichuris* eggs in soil at the two schools ( $p>0.05$ ).

Note:

- Rate of destroyed eggs in Co Phuc is 44%, Viet Thanh is 62%
- Rate of active eggs in Co Phuc is 43%, Viet Thanh is 47%.

The data show that:

Infection rate at Viet Thanh and Co Phuc is high (74%), though rate of heavy infection is low. As classified by WHO, infection rate among schooling age children at Tran Yen is at the medium. Infection rate by this study is lower than infection rate in rate of primary pupils in plain areas (Hoang Thi Kim et al, 1998). This can be explained by the reasons that untreated excreta is less commonly used for fertilisation than in plain areas, that lower population density in mountainous areas reduce the spread of infection.

There was no difference in infection rate among pupils in Co Phuc school (sanitation facility available) and Viet Thanh (facility not available). By direct observation, we discovered that though different latrines are used at the two schools, pupils there didn't have regular de-worming pills, untreated excreta is used for fertilisation, poor environment sanitation conditions. All these hinder the affects of septic latrines, consequently, infection rate would be high (30-40% use untreated excreta for fertilisation, 50% insanitary latrines)

Infection rate and density of Trichuris at Co Phuc is higher than at Viet Thanh, it was on the contrary for Hookworm. Trichuris is transferred through digestive system, depending on the environmental sanitation factors aforementioned while in Viet Nam, hookworm is transferred mainly through skin when directly contact with contaminated soil (mainly *N. americanus* 95%, Hoang Thi Kim et al). If rate of chidden moving on their bare foot is equal, we can say that environmental sanitation conditions in Viet Thanh is worse for the reason that soil is more infected with hookworm larvae. In this study, Berman technique to search for hookworm larvae was not utilised.

*3.2. Stool and soil examinations at Xuan Hong school (with sanitation facility) and Xuan Chau (without sanitation facility) at Xuan Truong district, Nam Dinh province*

224 stool samples of pupils at Xuan Hong school (120 boys and 104 girls), 227 stool samples of pupils at Xuan Chau school (116 boys and 111 girls) was examined. The mean age of pupils is 7.4. Also, 40 soil samples were collected for examinations (20 from each school). Results are presented below:

**Table 66: Infection rate of Ascaris, Trichuris and Hookworm among pupils**

School	No. of samples	General infection (%)	Ascaris (%)	Trichuris (%)	Hookworm (%)
Xuan Hong (with school sanitation facilities)	224	88.8	85.3	74.1	2.2
Xuan Chau (without school sanitation facilities)	227	93.4	93.4	78.0	7.5
p		p>0.05	p<0.05	p>0.05	p<0.05

Table 66 show high rate of worm infection among pupils at the two schools (88.8% vs. 93.4%), especially Ascaris and Trichuris. Infection rate of Hookworm was low. These rate reflect infection rate of people in Red River Delta. This also point out that de-worming program has not been implemented in all the study sites.

Nevertheless, infection rate of certain species in Xuan Hong is lower than at school with old type latrines, there were significant difference in general infection rate, infection of *Ascaris*, hookworm ( $p < 0.05$ ). This is compliant with results of examinations for worm eggs in soils presented in table 68.

Examinations also reveal that most pupils were infected with two species (77.4% vs. 75.9%) and there was not significant difference in infection rate of male pupils.

**Table 67: Density of infection of *Ascaris*, *Trichuris*, Hookworm among pupils at the two primary schools**

School	No. of samples	Epg		
		<i>Ascaris</i>	<i>Trichuris</i>	Hookworm
Xuan Hong	100	10019 ± 7892	433 ± 324	10 ± 50
Xuan Chau	100	12994 ± 8243	672 ± 620	49 ± 128
	200	$p < 0.05$	$p < 0.05$	$p < 0.05$

Data in table 67 show very high density of infection, especially for *Ascaris*, *Trichuris* among pupils. Nevertheless, density of infection at case schools is all significantly lower than control ( $p < 0.05$ )

It can be concluded that pupils at schools with UNICEF supported sanitation facilities had lower infection rate and density than pupils at schools with old type sanitation facilities. This reflect the ability to reduce spread of worm eggs to external environment of septic latrines, better environmental sanitation conditions, better KAP on environmental sanitation and control of worm infection of pupils and community.

**Table 68: Soil samples from school ground infected with worm eggs**

School	No. of samples	General infection (%)		<i>Ascaris</i>		<i>Trichuris</i>	
		+	%	+	%	+	%
Co Phuc	20	13	65.0	12	60.0	6	30.0
Viet Thanh	20	19	95.0	19	95.0	13	65.0
p		$p < 0.05$		$p < 0.05$		$p < 0.05$	

Data show that percentage of soil samples taken from Xuan Hong school infected with *Ascaris*, *Trichuris* eggs are lower than samples taken from Xuan Chau. The difference is significant with  $p < 0.05$ .

Table 69: Density of infection of soil samples taken from school ground

School	No. of samples	Ascaris			Trichuris		
		Eggs/100 gr. of soil	Eggs in infective phase (%)	Dead eggs (%)	Eggs/100 gr. of soil	Eggs in infective phase (%)	Dead eggs (%)
Xuan Hong	20	25	28.0	68.0	5	20.0	60.0
Xuan Chau	20	51	58.8	23.5	17	58.7	17.6
p		p<0.001			p<0.001		

Density of *Ascaris* and *Trichuris* infection of soil sample taken from Xuan Hong is respectively 25 and 5 eggs/100 gr. of soil, the corresponding rate at Xuan Chau is 51 and 17 eggs/100 gr. of soil. At the same time, rate of eggs in infective phase at Xuan Hong is much lower than at Xuan Chau (28.0% and 20.0% vs. 58.8% and 58.7% respectively). The difference is significant with  $p < 0.001$  (Table 69).

Worm eggs in soil is closely link to conditions of latrines and usage. Septic latrines, Sulabh latrines minimise the spread of worm eggs to surrounding environment. Most eggs that spread to surrounding environment have been processed at tanks of the latrines, hence rate of eggs in infective phase was low. This lead to the difference in worm eggs in soils at ground of schools with different types of latrines.

The higher worm eggs in soils (density and rate of eggs in infective phase), the higher risk of infection for people. In this study, infection risk of pupils at schools using overhang latrines is higher than schools with sanitation facilities.



## V. CONCLUSIONS

Interviews were made at 16 communes with sanitation facilities of primary schools provided by UNICEF and 8 communes with no facilities. Respondents was 961 primary pupils, 1907 pupil's parents and community members. At the same time, in-depth interviews and group discussions with communal leaders, teachers, pupils, pupil's parents and community group were made. Examinations of worm eggs in soil of school grounds were conducted. The following conclusions were made:

### **1. Knowledge of pupils on environment sanitation, control of worm infection:**

Knowledge on environmental sanitation and control of worm infection of pupils in schools with sanitation facilities provided by UNICEF is higher than those at control schools, generally, primary school pupils had good knowledge in this area. It was identified that 95.3% pupils knew excreta not being collected and processed was insanitary, 98% pupils knew it was sanitary to defecate in latrines, 91.8% pupils knew about sanitary latrines, 98.3% knew about sources of safe water, 94.5% knew about diseases caused by contaminated water, 98.2% knew about boiling water before drinking, 94.8% pupils know about harms of worm infection, 96.0% know measures to control worm infection, 91.5% know places flies born.

Pupils of primary schools all learn health education. Together with the facilities, these are important sources of information on environmental sanitation and control of worm infection for pupils (83.7%). All primary pupils like health education subject (100%) because they perceive it is useful and realistic.

### **2. Difference in environmental sanitation, control of worm infection KAP between pupils from schools with sanitation facilities and those from schools without the facilities**

#### *2.1. Knowledge and Attitude*

Knowledge, attitude on environmental sanitation and control of worm infection of primary pupils at schools with sanitation facilities is significantly better than those at schools without the facilities:

- Know 3-4 types of sanitary latrines (7.9% vs. 1.6%)
- Know 1-4 sources of safe water (99.2% vs. 96.2%)
- Know 1-8 diseases caused by contaminated water (96.4% vs. 90.6%)

- Know 1-3 effects of boiling water before use (94.1% vs. 90.3%)
- Know 1-8 causes of worm infection (97.0% vs. 90.3%), know 4 causes (15.6% vs. 9.7%)
- Know 1-5 harms of worm infection (90.8% vs. 84.1%), know 2 harms (33.4% vs. 19.1%), 3-5 harms (15.8% vs. 7.5%)
- Know 1-11 measures to control worm infection (97.3% vs. 93.4%), know 3-5 measures (54.6% vs. 43.4%)
- Know 3 places flies born (19.7% vs. 12.2%)
- Desire to have sanitary latrines at home (95.8% vs. 74.3%)

## *2.2. Practices*

Practices on safe water & environmental sanitation of primary pupils at schools with sanitation facilities is significantly better than those at schools without facilities:

- No defecation outside latrines (92.5% vs. 88.1%)
- Regular handwash before meals (89.2% vs. 76.9%), regular handwash after defecation (87.8% vs. 73.1%)
- Prevent flies (98.3% vs. 94.7%)
- No drink unboiled water (93.3% vs. 86.6%)
- Participate in sanitation information at villages (37.0% vs. 30.3%), participate in cleaning activities (77.9% vs. 56.2%).

Especially, pupils at case schools care more about sanitary behaviours of other people than those at control schools: care about handwash before meals and after defecation of others (95.9% vs. 91.2%), positively response when others drink unboiled water (92.1% vs. 88.7%), positively response when there is raw vegetable at meals (91.6% vs. 86.6%).

School sanitation facilities support the knowledge from health education subject to enable pupils to have better KAP on environmental sanitation and control of worm infection than those at control schools.

## **3. Information on health education/environment sanitation from pupils to families and community**

Information on health education, environment sanitation that pupils learn at schools is transferred to their families and other people when pupils talk or

remind others to practice sanitary habits and personal hygiene, 88.7% pupils talked to their parents about health education, 71.0% pupils talked to their parents about their need for school sanitation facilities, 40.9% pupils talked to their parents about their need for sanitation facilities at home, 93.1% parents received information about the sanitation facilities at schools, 69.6% pupil's parents heard from their children, 65.3% parents came to see the facilities, 45.5% community members consider schools, pupils and pupils' parents the major sources of information on environmental sanitation.

#### **4. KAP on environment sanitation of pupils' parents**

Under influences from children, there have been changes in KAP on personal hygiene, environmental sanitation of pupil's parents. Pupils' parents from school with sanitation facilities provided by UNICEF had better KAP on environmental sanitation, control of worm infection than the control. The difference is significant:

- Know about sanitary latrines (97.6% vs. 94.1%),
- Know 3-4 sources of safe water (20.8% vs. 13.7%),
- Know diseases caused by contaminated water (95.5% vs. 92.2%),
- Know causes of worm infection (97.1% vs. 91.6%),
- Know harms of worm infection (96.0% vs. 90.9%),
- Know measures to prevent worm infection (99.0% vs. 96.9%), places flies born (95.6% vs. 92.2%),
- Know sanitary latrines at homes of pupils' parents (41.2% vs. 18.7%),
- No use untreated excreta for fertilisation (71.2% vs. 63.1%),
- Never drink unboiled water (85.9% vs. 79.1%),
- Frequent handwash before meals and after defecation (61.7% vs. 53.1%),
- Handwash with soap (31.9% vs. 24.4%),
- Prevent flies (97.9% vs. 92.8%),
- Take de-worming pills (72.4% vs. 67.2%).

## **5. Personal hygiene, household sanitation, environmental sanitation KAP of community**

KAP on personal hygiene, household sanitation and environmental sanitation of community in areas with UNICEF sanitation facilities are better than those in control community, e.g. knowledge about sanitary latrines; safe water; diseases caused by contaminated water, harms and measures to prevent worm infection; personal hygiene; environmental sanitation. The differences between case and control are significant.

## **6. Direct observation on household sanitation of pupil's family and community**

Direct observations on 1907 households revealed higher rate of water sealed latrines, two-tanks latrines in community with case schools than control. The rates were 15.7% vs. 9.6% and 24.3% vs. 16.4%. Rate of sanitary latrines among septic and two-tank ones was also significantly higher at case than control, 57.6% vs. 41.1% and 49.6% vs. 44.8% respectively.

Evaluations with five indicators on sanitary practices of households were conducted. Results show that the indicators of households with case schools was significantly higher than control with  $p < 0.05$ .

## **7. Examinations on worm eggs in soil of school grounds, pupils' stool**

*7.1. Worm eggs in soil and stools at Co Phuc school (where septic latrines used) and Viet Thanh school (where overhang latrines used) at Tran Yen district, Yen Bai province*

Infection rate of pupils at Viet Thanh and Co Phuc schools is high (74%), though rate of heavy infection is very low.

There was no significant difference in infection rate of pupils at case and control schools in term of general infection, infection of *Ascaris* (74% vs. 74.1% and 41.1% vs. 37.3% respectively)

Infection rate and density for *Trichuris* of pupils at Co Phuc school is higher than those at Viet Thanh, it was on the contrary for hookworm.

*7.2. Examinations of soil and stool samples taken from Xuan Hong school (septic latrines used), Xuan Chau school (overhang latrines used)*

Infection in soil: rate of soil samples infected with worm eggs (*Ascaris*, *Trichuris*) at school ground of Xuan Hong is significantly lower ( $p < 0.05$ ) than

Xuan Chau, general infection (65% vs. 95%), Ascaris infection (60% vs. 95%), Trichuris infection (30% vs. 65%).

Density of worm eggs and eggs in infective phase at Xuan Hong is significantly lower than at Xuan Chau ( $p < 0.001$ ). Worm eggs in soil of school ground are as follow: Ascaris: eggs/100 gr. of soil 25 vs. 51, eggs in infective phase 28% vs. 58.8%, dead eggs 68.0% vs. 23.5%. Trichuris: eggs/100 gr. of soil 5 vs. 17, eggs in infective phase 20% vs. 58.7%, dead eggs 60% vs. 17.6%. Hence, UNICEF supported septic latrines have reduced the spread of worm eggs to external environment.

Examinations of stool samples of pupils (6-10 year old) reveal that infection rate, density of infection of all species at Xuan Hong is significantly lower than at Xuan Chau ( $p < 0.05$ ), general infection rate (88.8% vs. 93.4%), Ascaris (85.3% vs. 91.6%), hookworm (2.2% vs. 7.5%), density of infection of Ascaris ( $10,019 \pm 7,892$  vs.  $12,944 \pm 8,243$ ), density of infection of Trichuris ( $433 \pm 324$  vs.  $672 \pm 620$ ), hookworm ( $10 \pm 50$  vs.  $49 \pm 128$ )

The results reflect the restrain of worm eggs spreading to environment by septic latrines, better KAP on environmental sanitation and control of worm infection of pupils and community at community where school sanitation facilities available.

### **8. Role of schools, sanitation facilities in environment sanitation education and practices**

Schools play important role not only in health education for pupils but also influence their parents, community through pupils and activities of schools with regard to environment sanitation and control of worm infection. Teachers take health education an important subject, not only for knowledge but also the formation of pupils' personality. Teachers highly appreciate role of school sanitation facilities. They also appreciate the role of pupils in transferring information on environment sanitation and control of worm infection. Pupil's behaviours influence parents and community.

Safe water, environmental sanitation and control of worm infection for pupils are clearly perceived among local leaders and they take this as the responsibility of local government. Local leaders highly appreciate the initiative role of schools for community to follow. Nuclear role of schools, including teachers and pupils in sanitation and information. They also hope that school sanitation facilities will continue to be developed.

The school sanitation facilities funded by UNICEF are being effectively operated and used. 93.8% facilities are used frequently, serving teachers and the community. 75% facilities met technical and sanitary requirements, 80.3% pupils use the facilities everyday for urination and handwash, 100% pupils often receive messages about usage and maintenance of the facilities, 96.2% apply the regulations.

Pupils aware of benefits of school sanitation facilities through usage; maintenance of the facilities. This change KAP on personal hygiene, environmental sanitation in general and household sanitation in particular of pupils.

### 9. Objects of influences

Survey at 24 communes on environment sanitation, control of worm infection KAP of pupils and community reveal that environmental sanitation tasks has been properly realised to ensure efficiency, quality and sustainability. The children are agents for change.

*Study findings show that pupils, their parents and community members had good knowledge on safe water, environment sanitation and control of worm infection whereas poor practices and high infection rate due to the followings:*

*- Sanitary conditions of water sources and latrines of the households have been poor, only 48.3% latrines could meet sanitary requirements, 35% households had access to safe water for cooking and living activities.*

*- De-worming has not been regularly conducted for pupils and community members, only few people took de-worming pills. Consequently, infection rate was high and spread of worm infection was serious.*

*- People in these areas continue to use untreated or improperly treated excreta for fertilising or fishing.*

*Those have been the shortcomings that to be influence to enable people to have better knowledge, attitude and practices.*

## VI. RECOMMENDATIONS

1. The policy to build school sanitation facilities with financial and technical assistance from UNICEF is appropriate. It is believed that if more assistance from UNICEF can be made available, the program will be strengthened; more primary schools will have sanitation facilities, creating long lasting benefits for teachers, pupils and community.
2. Health education should be conducted in parallel with sanitary practices at schools. It has been proved that these component support each other, contributing to personality formation of pupils.
3. Pupils are vulnerable to worm infection. Infection rate and density among pupils are high, pupils are source of worm infection for community, hence, de-worming program should be implemented at schools.
4. Information on environmental sanitation & control of worm infection should be strengthened to gradually change knowledge and practices of community. Priority should be given to the role of pupils in community, there should be co-operations between relevant agencies and local authorities. In the short term, a model should be set up for community trial at district level to combine chemotherapy and environmental sanitation measures. Afterward, the model should be reviewed before multiple

**QUESTIONNAIRE**  
FOR KNOWLEDGE, ATTITUDE, PRACTICE OF PUPILS ON SCHOOL  
SANITATION AND CONTROL OF WORM INFECTION

Province:..... District:..... Commune:.....

1. Respondent's name: ..... 2. Sex: Male: 1, Female:

2

3. Age:..... 4 Class: .....

No.	Questions	Answers	Code
1	Do you think human excreta scattered in gardens, at road side or field dam is insanitary?	<ul style="list-style-type: none"> <li>- Yes</li> <li>-- No</li> <li>- Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
2	Do you usually defecate at the aforementioned places?	<ul style="list-style-type: none"> <li>-- Usually</li> <li>- Sometimes</li> <li>Never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
3	In your opinion, where is the sanitary place for defecation?	<ul style="list-style-type: none"> <li>- Do not know</li> <li>- Latrine</li> <li>- Chamber-pot</li> <li>- Pigpens</li> <li>-- Others(Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
4	What type of sanitary latrines do you know?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Two-tank latrines</li> <li>-- Septic latrines</li> <li>- Sulabh latrines</li> <li>Improved dug latrines</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> </ul>
5	In your opinion, which of the water sources listed here is sanitary for cooking and living activities?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Rain water</li> <li>- Running water</li> <li>Drilled wells</li> <li>- Open dug wells</li> <li>Spring water</li> <li>- River water</li> <li>- Ponds, lakes</li> <li>-- "Mang lan" canal</li> <li>-- Other( Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> </ul>



6	What disease can be caused by using insanitary water for drinking or bathing?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Diarrhea</li> <li>- Cholera</li> <li>- Dysentery</li> <li>- Typhoid</li> <li>- Hepatitis</li> <li>- Parasitic infection</li> <li>- Trachoma</li> <li>- Scabies</li> <li>- Ringworm</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> </ul>
7	What is the purpose of boiling water before drinking?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Eliminate germs</li> <li>- Eliminate worm eggs</li> <li>- To keep hygiene</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
8	Do you know the why people get worm infection?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Eating raw vegetable without proper cleaning</li> <li>- Drinking unboiled water</li> <li>- Insanitary eating or drinking habit</li> <li>- No handwash before eating</li> <li>- No handwash after defecations</li> <li>- No handwash with soap before eating</li> <li>- No handwash with soap after defecations</li> <li>- Putting hand into mouth</li> <li>- Flies visit food</li> <li>- Contact with excreta, contaminated soil</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> <li>12</li> </ul>
9	Do you know any harms of worm infection?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Abdominal discomfort</li> <li>- Physically weak, weight lost</li> <li>- Anemia</li> <li>- Bowel obstruction</li> <li>- Worm evacuate to bile duct</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>

10	What should be done to prevent worm infection?	<ul style="list-style-type: none"> <li>-- Don't know</li> <li>-- Keep houses, gardens, kitchens clean</li> <li>-- Use sanitary latrines</li> <li>-- No defecations at forbidden places</li> <li>- No use unprocessed excreta for fertilizing</li> <li>-- Don't eat raw vegetables</li> <li>-- Don't drink unboiled water</li> <li>- Eliminate flies</li> <li>-- Keep food away from flies</li> <li>- Handwash before eating</li> <li>-- Handwash after defecations</li> <li>-- Handwash with soap before eating</li> <li>- Handwash with soap after defecations</li> <li>-- Take de-worming pills</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> <li>12</li> <li>13</li> <li>14</li> <li>15</li> <li>16</li> </ul>
11	Do you know where flies are born?	<ul style="list-style-type: none"> <li>-- Don't know</li> <li>-- Insanitary latrines</li> <li>-- Piggpens</li> <li>-- Human excreta</li> <li>-- Animal excreta</li> <li>-- Bodies of died animals</li> <li>-- Waste</li> <li>Other (specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> </ul>
12	Where did receive the information from (1-11)?	<ul style="list-style-type: none"> <li>-- Teachers</li> <li>-- Textbooks</li> <li>-- Parents, relatives</li> <li>Health staffs</li> <li>Friends</li> <li>Radio</li> <li>-- TV</li> <li>-- Newspaper, books</li> <li>-- Loudspeakers</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> </ul>

13	Do you learn health education at school?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No → Q17</li> <li>- Don't know → Q17</li> </ul>	<p>1</p> <p>2</p> <p>3</p>
14	If yes, do you like this subject?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No → Q16</li> </ul>	<p>1</p> <p>2</p>
15	If you do, give the reason?	<ul style="list-style-type: none"> <li>- It is useful</li> <li>- It is easy to learn</li> <li>- Interesting lectures</li> <li>- Other (Specify) .....</li> </ul>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>
16	If you don't, give the reason?	<ul style="list-style-type: none"> <li>- It is not necessary</li> <li>- It is difficult to understand</li> <li>- It is difficult to remember</li> <li>- Lectures not interesting</li> <li>- Lack of textbook</li> <li>- Lack of visual learning aids</li> <li>- Other (Specify) .....</li> </ul>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p>
17	If you don't learn health education at school, do you think it is necessary?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No</li> <li>- Don't know</li> </ul>	<p>1</p> <p>2</p> <p>3</p>
18	Have sanitation facilities been built at your schools? (latrines, urination areas & water supply)	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No → Q35 (for pupils of schools without UNICEF supported sanitation facilities)</li> </ul>	<p>1</p> <p>2</p>
19	Do you know what type of school latrines are?	<ul style="list-style-type: none"> <li>- Do not know</li> <li>- Septic latrines</li> <li>- Other (Specify) .....</li> </ul>	<p>1</p> <p>2</p> <p>3</p>
20	Do you think it is necessary to built school sanitation facilities?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No → Q22</li> <li>- Do not know → Q22</li> </ul>	<p>1</p> <p>2</p> <p>3</p>

21	If yes, give the reason?	<ul style="list-style-type: none"> <li>-- Don't know</li> <li>-- Keep sanitary</li> <li>-- Prevent excreta-related diseases</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
22	If no, give the reason?	<ul style="list-style-type: none"> <li>-- No answer</li> <li>It is acceptable to defecate anywhere</li> <li>-- Facilities are not in use</li> <li>-- Not convenient for use</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
23	What do you think about the school sanitation facilities?	<ul style="list-style-type: none"> <li>-- Clean</li> <li>-- Dirty</li> <li>-- Medium</li> <li>-- No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
24	Are there enough latrines?	<ul style="list-style-type: none"> <li>Excessive</li> <li>Enough</li> <li>Insufficient</li> <li>Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
25	Are there enough places for passing water?	<ul style="list-style-type: none"> <li>Excessive</li> <li>Enough</li> <li>Insufficient</li> <li>Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
26	Is there enough water for flushing at the facilities?	<ul style="list-style-type: none"> <li>-- Enough</li> <li>-- Insufficient</li> <li>-- Do not know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
27	Do you usually use school sanitation facilities?	<ul style="list-style-type: none"> <li>-- Usually</li> <li>-- Not usually → Q29</li> <li>-- Never → Q29</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
28	If you usually use school sanitation facilities, specify? (SKIP TO Q30)	<ul style="list-style-type: none"> <li>-- Defecate</li> <li>-- Pass water</li> <li>-- Handwash</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>

29	If you don't usually use school sanitation facilities, why?	<ul style="list-style-type: none"> <li>-- No answer</li> <li>-- No facilities in use</li> <li>- Not enough</li> <li>-- Embarrassment</li> <li>Dirty</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> </ul>
30	Have you ever been introduced the usage regulations for the facilities?	<ul style="list-style-type: none"> <li>Yes</li> <li>No</li> <li>- Don't remember</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
31	What have you done to keep the facilities clean?	<ul style="list-style-type: none"> <li>Don't remember</li> <li>- Defecate at right place</li> <li>Pass water at right place</li> <li>- Flush water after use</li> <li>- Put waste paper into waste bin</li> <li>Ask friends to keep the facilities clean</li> <li>Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
32	What have you done to preserve the facilities?	<ul style="list-style-type: none"> <li>No answer</li> <li>-- No draw nor write on walls</li> <li>-- Don't play or break pumps</li> <li>Don't dmage the doors</li> <li>- Ask friends to preserve the facilities</li> <li>-- Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> </ul>
33	Do you usually participate in cleaning the facilities?	<ul style="list-style-type: none"> <li>Usually</li> <li>-- Sometimes</li> <li>-- Never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
34	Have you ever talked to your parents about the school sanitary facilities?	<ul style="list-style-type: none"> <li>Yes</li> <li>-- No</li> <li>Don't remember</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
35	If the school sanitation facilities are not available, where do you defecate when you are at school?	<ul style="list-style-type: none"> <li>- Old type sanitation facilities</li> <li>Come home, use facilities of families nearby schools</li> <li>-- Road sides, fields or gardens</li> <li>- No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>

36	Do you think it is necessary for your school to have sanitation facilities?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No → Q38</li> <li>- Don't know → Q38</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
37	If yes, have you ever talked to your parents about the ideal?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No</li> <li>- Don't remember</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
38	Is sanitary latrine available at your house?	<ul style="list-style-type: none"> <li>- Yes → Q41</li> <li>- No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> </ul>
39	If not, do you want your families to build one?	<ul style="list-style-type: none"> <li>-- Yes</li> <li>No → Q41</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> </ul>
40	If you want, have you ever talked to your parents about your need?	<ul style="list-style-type: none"> <li>- Yes</li> <li>No</li> <li>-- No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
41	What source of water do your family use for cooking?	<ul style="list-style-type: none"> <li>Don't know</li> <li>- Rain water</li> <li>Running water</li> <li>-- Drilled wells</li> <li>- Open dug wells</li> <li>- Spring water</li> <li>- Ponds, lakes</li> <li>- River water</li> <li>- "Mang lan" canal</li> <li>- Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> </ul>
42	Do you think handwash before eating is necessary?	<ul style="list-style-type: none"> <li>-- Yes</li> <li>- No</li> <li>- Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
43	Do you think handwash is necessary after going to stool?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No</li> <li>- Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>

44	Do you usually wash your hands before eating?	<ul style="list-style-type: none"> <li>— Yes, usually</li> <li>— Yes, sometimes</li> <li>— No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
45	Do you usually wash your hand after defecations?	<ul style="list-style-type: none"> <li>-- Yes, usually</li> <li>-- Yes, sometimes</li> <li>— No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
46	Do you wash your hand with soap before eating?	<ul style="list-style-type: none"> <li>-- Yes, usually</li> <li>-- Yes, sometimes</li> <li>— No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
47	Do you usually wash your hand with soap after defecations?	<ul style="list-style-type: none"> <li>- Yes, usually</li> <li>-- Yes, sometimes</li> <li>— No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
48	Do you notice that other people in your family wash their hands before eating?	<ul style="list-style-type: none"> <li>— Yes, usually</li> <li>— Yes, sometimes</li> <li>— No, never</li> <li>— Don't care</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
49	Do you notice that other people in your family wash their hands after defecations?	<ul style="list-style-type: none"> <li>— Yes, usually</li> <li>-- Yes, sometimes</li> <li>— No, never</li> <li>— Don't care</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
50	What have you done to prevent and eliminate flies?	<ul style="list-style-type: none"> <li>— Nothing</li> <li>— Use cover for food and cupboard</li> <li>— Use fly thrash</li> <li>-- Keep house, toilets, pigpens clean</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>

51	Do you usually drink unboiled water?	<ul style="list-style-type: none"> <li>– Usually</li> <li>– Not usually</li> <li>– Never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
52	If you notice that someone in your family is drinking unboiled water, what will you do?	<ul style="list-style-type: none"> <li>– No answer</li> <li>– Advise them to drink boiled water</li> <li>– Boil the water</li> <li>– Nothing</li> <li>– Other (Specify)</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
53	If your families have raw vegetable in meal, what will you do?	<ul style="list-style-type: none"> <li>– Nothing</li> <li>– No answer</li> <li>– Eat the vegetable</li> <li>– Don't eat the vegetable</li> <li>– Advise them to clean vegetable thoroughly</li> <li>– Clean the vegetable yourself</li> <li>– Advise them not to eat</li> <li>– Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> </ul>
53	Have you ever participated in sanitation propaganda at your village?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> <li>– Don't remember</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
54	Have you ever participated in cleaning at your village?	<ul style="list-style-type: none"> <li>– Usually</li> <li>– Sometimes</li> <li>– Never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>

*Investigator*  
(Signature)

*Supervisor*  
(Signature)



**QUESTIONNAIRE**  
FOR KNOWLEDGE, ATTITUDE, PRACTICE OF PUPILS' PARENTS ON  
SANITATION AND CONTROL OF WORM INFECTION

Province:..... District:..... Communc:.....

1. Respondent's name: ..... Sex: Male: 1, Female: 2

2. Age:.....

3. Main occupation:

- |                    |                         |
|--------------------|-------------------------|
| 1. Farmer          | 5. Retired              |
| 2. Handicraft      | 6. Unemployed           |
| 3. Business person | 7. Other (Specify)..... |
| 4. Teacher         |                         |

4. Educational level:

- |               |                                      |
|---------------|--------------------------------------|
| 1. Illiterate | 4. Lower secondary                   |
| 2. Literate   | 5. High school                       |
| 3. Primary    | 6. Intermediate, college, university |

5. Household's economic situation (1999):

- |                |                                              |
|----------------|----------------------------------------------|
| 1. Prosperous  | 3. Food shortage for less than 2 months/year |
| 2. Enough food | 4. Food shortage for more than 2 months/year |

**INTERVIEW DATA**

No.	Questions	Answers	Code
1	Can you tell types of sanitary latrine?	-- Don't know -- Two-tank latrines -- Septic latrines Sulabh latrines -- Improved dug latrines -- One-tank latrines -- Overhang on land Overhang on ponds -- Other (Specify) .....	1 2 3 4 5 6 7 8 9
2	Can you tell sources of sanitary water for cooking and other living activities?	Don't know -- Rain water -- Running water -- Drilled wells -- Open dug wells	1 2 3 4 5

		<ul style="list-style-type: none"> <li>– Spring water</li> <li>– River water</li> <li>– Ponds, lakes</li> <li>– "Mang lan" canal</li> <li>– Other( Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> </ul>
3	What disease can be caused by using contaminated water?	<ul style="list-style-type: none"> <li>-- Don't know</li> <li>-- Diarrhea</li> <li>-- Cholera</li> <li>  Dysentery</li> <li>-- Typhoid</li> <li>-- Hepatitis</li> <li>  Parasitic infection</li> <li>  Trachoma</li> <li>  Scabies</li> <li>  Ringworm</li> <li>  Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> </ul>
4	Do you know why people get worm infection?	<ul style="list-style-type: none"> <li>Don't know</li> <li>-- Eating raw vegetable</li> <li>-- Drinking unboiled water</li> <li>-- Insanitary eating or drinking habit</li> <li>-- No handwash before eating</li> <li>-- No handwash after defecations</li> <li>-- No handwash with soap before eating</li> <li>-- No handwash with soap after defecations</li> <li>-- Putting hands into mouth</li> <li>-- Flies visit food</li> <li>-- Contact with excreta</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> <li>12</li> </ul>
5	Do you know any harms of worm infection?	<ul style="list-style-type: none"> <li>-- Don't know</li> <li>-- Physically weak, weight lost</li> <li>  Anemia</li> <li>-- Bowel obstruction</li> <li>-- Worm evacuate to bile duct</li> <li>-- Abdominal discomfort, mal-digestion</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>

6	Do you know how to prevent worm infection?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Keep houses, gardens clean</li> <li>- Use sanitary latrines</li> <li>- No defecations at forbidden places</li> <li>- No use improperly treated excreta for fertilizing</li> <li>- Do not eat raw vegetables</li> <li>- Do not drink unboiled water</li> <li>- Use safe water</li> <li>- Eliminate flies</li> <li>- Keep food away from flies</li> <li>- Handwash before eating</li> <li>- Handwash after defecations</li> <li>- Handwash with soap before eating</li> <li>- Handwash with soap after defecations</li> <li>- Take de-worming pills</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> <li>12</li> <li>13</li> <li>14</li> <li>15</li> <li>16</li> </ul>
7	Do you know where flies are born?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Insanitary latrines</li> <li>- Piggpens</li> <li>- Human excreta</li> <li>- Animal excreta</li> <li>- Bodies of died animals</li> <li>- Waste</li> <li>- Others (specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> </ul>
8	Where did receive the information from? (1-7)	<ul style="list-style-type: none"> <li>- Children (primary school children)</li> <li>- Relatives</li> <li>- Local authorities</li> <li>- Health workers</li> <li>- Neighbours, friends</li> <li>- Radio, TV, loudspeakers</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
9	Have sanitation facilities been built at the school of your children?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No → Q19</li> <li>- Don't know → Q19</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>

10	If yes, did you contribute anything to the build the facilities?	<ul style="list-style-type: none"> <li>-- Money ..... VND</li> <li>-- Materials ..... VND</li> <li>-- Labor ..... workday</li> <li>-- Nothing</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
11	Have you ever visited the school sanitation facilities?	<ul style="list-style-type: none"> <li>-- Yes</li> <li>-- No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> </ul>
12	Do you think it is necessary to built school sanitation facilities?	<ul style="list-style-type: none"> <li>-- Yes</li> <li>-- No → Q14</li> <li>-- Don't know → Q14</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
13	If yes, give the reason?	<ul style="list-style-type: none"> <li>-- Don't know</li> <li>-- Keep sanitary</li> <li>-- Prevent excreta-related diseases</li> <li>-- Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
14	If no, give the reason?	<ul style="list-style-type: none"> <li>-- No answer</li> <li>-- It is acceptable to defecate, pass water anywhere</li> <li>-- Facilities are used</li> <li>-- Inconvenient for use</li> <li>-- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
15	Have your children ever talked about the school sanitation facilities?	<ul style="list-style-type: none"> <li>-- Yes</li> <li>-- No → Q20</li> <li>-- Do not remember → Q20</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
16	If yes, how did he regard the facilities?	<ul style="list-style-type: none"> <li>-- Praise</li> <li>-- Criticize → Q18</li> <li>-- Both praise and criticize</li> <li>-- No comments → Q19</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
17	If he praised the facilities, what about?	<ul style="list-style-type: none"> <li>-- Clean, sanitary</li> <li>-- Convenient</li> <li>-- Don't remember</li> <li>-- Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
18	If he criticized the facilities, what about?	<ul style="list-style-type: none"> <li>-- Don't remember</li> <li>-- Dirty</li> <li>-- Insufficient places</li> <li>-- Not enough water</li> <li>-- Breakdown</li> <li>-- Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> </ul>

19	If school sanitation facilities are not available, where do your children defecate when they are at school?	<ul style="list-style-type: none"> <li>– Don't know</li> <li>– Old latrines</li> <li>– Go home, use facilities of families nearby</li> <li>– Road sides, fields or gardens</li> <li>– Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
20	Do you think it is necessary to build school sanitation facilities?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No → Q22</li> <li>– Don't know → Q22</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
21	If the facilities are to be built, will you willing to contribute?	<ul style="list-style-type: none"> <li>– Yes, money</li> <li>– Yes, labor</li> <li>– No, unable</li> <li>– No</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
22	Is sanitary latrine available at your house?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No → Q25</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> </ul>
23	If yes, what type?	<ul style="list-style-type: none"> <li>– Septic latrines → Q24</li> <li>– Sulabh latrines → Q24</li> <li>– Two-tank latrines → Q24</li> <li>– Improved dug → Q24</li> <li>– One-tank latrines → Q25</li> <li>– Overhang on land → Q25</li> <li>– Other (Specify) ..... → Q25</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
24	Have your children ever told you that your family need a sanitary latrine?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> <li>– Don't remember</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
25	If you don't have sanitary latrines, have your children ever talked about their need for the latrine?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> <li>– Don't remember</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
26	Do you use improperly treated excreta (incubation in less than 3 months) for fertilizing?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>

27	What sources of water do your family use for cooking?	<ul style="list-style-type: none"> <li>– Rain water</li> <li>– Running water</li> <li>– Drilled wells</li> <li>– Open dug wells</li> <li>– Spring water</li> <li>– River water</li> <li>– Ponds, lakes</li> <li>– "Mang lan" canal</li> <li>– Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> </ul>
28	Do you usually drink unboiled water?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
29	What do you do with eating raw vegetable?	<ul style="list-style-type: none"> <li>– Don't eat</li> <li>– Clean vegetable with salty water</li> <li>– Clean vegetable with <math>KMnO_4</math></li> <li>– Multiple clean vegetable with clean water</li> <li>– Clean at ponds, lake, spring</li> <li>– No cleaning</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
30	Do you/your family usually eat raw meat?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
31	Do you/your family usually wash hand before eating or after defecations?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
32	Do you/your family usually wash hands with soap?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
33	What have you done to prevent and eliminate flies?	<ul style="list-style-type: none"> <li>– Nothing</li> <li>– Use cover for food and cupboard</li> <li>– Use fly thrash</li> <li>– Keep house, toilets, pigpens clean</li> <li>– Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>

34	Have any of your family members taken de-worming pills in the last six months?	— Everybody	1
		— Some people	2
		— None	3
		— Don't know	4

*Investigator*  
(Signature)

*Supervisor*  
(Signature)

**QUESTIONNAIRE**  
**FOR KNOWLEDGE, ATTITUDE, PRACTICE OF COMMUNITY ON**  
**HYGIENE AND CONTROL OF WORM INFECTION**

Province:..... District:..... Commune:.....

1. Respondent's name: ..... 2. Age:..... 3. Sex: Male: 1, Female:

2

4. Main occupation:

- |                    |                         |
|--------------------|-------------------------|
| 1. Farmer          | 5. Retired              |
| 2. Handicraft      | 6. Unemployed           |
| 3. Business person | 7. Other (Specify)..... |
| 4. Teacher         |                         |

5. Educational level:

- |               |                                      |
|---------------|--------------------------------------|
| 1. Illiterate | 4. Lower secondary                   |
| 2. Literate   | 5. High school                       |
| 3. Primary    | 6. Intermediate, college, university |

5. Household's economic situation (1999):

- |                |                                              |
|----------------|----------------------------------------------|
| 1. Prosperous  | 3. Food shortage for under 2 months/year     |
| 2. Enough food | 4. Food shortage for more than 2 months/year |

**INTERVIEW DATA**

No.	Questions	Answers	Code
1	Do you know any type of sanitary latrine?	– Don't know	1
		– Two-tank latrines	2
		– Septic latrines	3
		– Sulabh latrines	4
		– Improved dug latrines	5
		– One-tank latrines	6
		– Overhang on land	7
		– Overhang on ponds	8
		– Others (Specify) .....	9
2	Can you tell sanitary sources of water for cooking and other living activities?	– Don't know	1
		– Rain water	2
		– Running water	3
		– Drilled wells	4



		<ul style="list-style-type: none"> <li>– Open dug wells</li> <li>– Water from springs</li> <li>– River water</li> <li>– Ponds, lakes</li> <li>– "Mang lan" canal</li> <li>– Other( Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> </ul>
3	Can you tell names of diseases caused by contaminated water?	<ul style="list-style-type: none"> <li>– Don't know</li> <li>– Diarrhea</li> <li>– Cholera</li> <li>– Dysentery</li> <li>– Typhoid</li> <li>– Hepatitis</li> <li>– Parasitic infection</li> <li>– Trachoma</li> <li>– Scabics</li> <li>– Ringworm</li> <li>– Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> </ul>
4	Do you know why people get worm infection?	<ul style="list-style-type: none"> <li>– Don't know</li> <li>– Eating raw vegetable without proper cleaning</li> <li>– Drinking unboiled water</li> <li>– Insanitary eating or drinking habit</li> <li>– Drink contaminated water</li> <li>– No handwash before eating</li> <li>– No handwash after defecation</li> <li>– No handwash with soap before eating</li> <li>– No handwash with soap after defecation</li> <li>– Putting dirty hand into mouth</li> <li>– Flies visit food</li> <li>– Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> <li>12</li> </ul>
5	Can you tell harms of worm infection?	<ul style="list-style-type: none"> <li>– Don't know</li> <li>– Abdominal discomfort</li> <li>– Physically weak, weight lost, pale complexion</li> <li>– Anemia</li> <li>– Bowel obstruction</li> <li>– Worm evacuate to bile duct</li> <li>– Others (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>

6	Do you know how to control worm infection?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Keep houses, gardens clean</li> <li>- Use sanitary latrines</li> <li>- No defecation at forbidden places</li> <li>- No use improperly treated excreta for fertilizing</li> <li>- Don't eat raw vegetables</li> <li>- Don't drink unboiled water</li> <li>- Use safe water</li> <li>- Eliminate flies</li> <li>- Keep food away from flies</li> <li>- Handwash before eating</li> <li>- Handwash after defecation</li> <li>- Handwash with soap before eating</li> <li>- Handwash with soap after defecations</li> <li>- Take de-worming pills</li> <li>- Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> <li>10</li> <li>11</li> <li>12</li> <li>13</li> <li>14</li> <li>15</li> <li>16</li> </ul>
7	Do you know where flies are born?	<ul style="list-style-type: none"> <li>- Don't know</li> <li>- Insanitary latrines</li> <li>- Piggens</li> <li>- Human excreta</li> <li>- Animal excreta</li> <li>- Bodies of died animals</li> <li>- Waste</li> <li>- Others (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> </ul>
8	Where did receive the information from? (1-7)	<ul style="list-style-type: none"> <li>- Health workers</li> <li>- Neighbours, friends</li> <li>- Radio, TV, loudspeakers</li> <li>- Other (Specify)</li> <li>.....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
9	Have sanitation facilities been built at the school of your children?	<ul style="list-style-type: none"> <li>- Yes</li> <li>- No →11</li> <li>- Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>

10	If yes, who did you hear about the construction from?	<ul style="list-style-type: none"> <li>– Local authorities</li> <li>– Schools</li> <li>– Health workers</li> <li>– Pupil's parents</li> <li>– Pupils</li> <li>– Yourself</li> <li>– Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
11	Do you think it is necessary to built school sanitation facilities?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> <li>– Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
12	Is there a latrine at your house?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> </ul>
13	If yes, what type?	<ul style="list-style-type: none"> <li>– Septic</li> <li>– Sulabh latrines</li> <li>– Two-tank latrines</li> <li>– Improved dug latrines</li> <li>– One-tank latrines</li> <li>– Overhang on land</li> <li>– Other (Spccify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
14	Do you use untreated or improperly treated excreta (incubation in less than 3 months) for fertilizing?	<ul style="list-style-type: none"> <li>– Yes</li> <li>– No</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
15	What sources of water do your family use for cooking?	<ul style="list-style-type: none"> <li>– Rain water</li> <li>– Running water</li> <li>– Drilled wells</li> <li>– Open dug wells</li> <li>– Spring water</li> <li>– River water</li> <li>– Ponds, lakes</li> <li>– "Mang lan" canal</li> <li>– Other (Specify).....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> <li>9</li> </ul>

16	Do you usually drink unboiled water?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
17	What do you do with eating raw vegetable?	<ul style="list-style-type: none"> <li>– Don't eat</li> <li>– Clean the vegetable with KMNO<sub>4</sub></li> <li>– Clean with salty water</li> <li>– Multiple cleaning with safe water</li> <li>– Clean at ponds, river, springs</li> <li>– No cleaning</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ul>
18	Do you/your family usually eat raw meat?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> <li>– No answer</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>
19	Do you/your family usually wash hand before eating or after defecations?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
20	Do you/your family usually wash hands with soap?	<ul style="list-style-type: none"> <li>– Yes, usually</li> <li>– Yes, sometimes</li> <li>– No, never</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul>
21	What have you done to prevent and eliminate flies?	<ul style="list-style-type: none"> <li>– Nothing</li> <li>– Use cover for food and cupboard</li> <li>– Use fly thrash</li> <li>– Keep house, toilets, pigpens clean</li> <li>– Other (Specify) .....</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>
22	Have any of your family members taken de-worming pill in the last six months?	<ul style="list-style-type: none"> <li>– All</li> <li>– Some people</li> <li>– None</li> <li>– Don't know</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> </ul>

*Investigator*  
(Signature)

*Supervisor*  
(Signature)

## CHECKLIST FOR HOUSEHOLD'S SANITATION

*(Attached with KAP questionnaire for pupil's parents & community members)*

Household:..... Commune .....

District..... Province .....

No.	Observe criteria	Yes (1)	No (2)
1	<p><b>Type of latrine</b></p> <ul style="list-style-type: none"> <li>– Septic latrines</li> <li>– Sulabh latrines</li> <li>– Two-compartment latrines</li> <li>– Overhang on land</li> <li>– One-compartment latrines</li> <li>– Ash spots</li> <li>– Other (Specify) .....</li> </ul>		
2	<p><b><u>Use of the latrine</u></b></p> <p><b>A. Septic latrine</b></p> <ul style="list-style-type: none"> <li>– Appropriate tanks</li> <li>– Inappropriate tanks</li> <li>– Water seal exist</li> <li>– No water seal</li> <li>– Enough water for flushing</li> <li>– Not enough water for flushing</li> <li>– Waste paper bin available</li> <li>– No waste paper bin available</li> <li>– Clean, no foul smell, few flies</li> <li>– Not clean, foul smell, numerous flies</li> </ul> <p><b>B. Two-compartment latrine</b></p> <ul style="list-style-type: none"> <li>– Right use, the two compartments are used one after the other</li> <li>– Wrong use</li> <li>– Hole lid available</li> <li>– No lid</li> <li>– Compartment door is closed</li> <li>– Compartment door is not closed</li> <li>– Additives substances available</li> <li>– No additive substances</li> <li>– Clean, no foul smell, few flies</li> <li>– Not clean, foul smell, numerous flies</li> </ul>		

	<b>Other types of latrines (Specify)</b> – Meet the required criteria – Don't meet the required criteria		
	<b>Household sanitation</b> – Clean and tidy house – Untidy and not clean house – Few flies in house and kitchen – Numerous flies in house and kitchen – Cover for foods available – No cover for foods available – Excreta collected and incubated – Excreta scattered, no incubation – Safe water available – No safe water available		

**Remarks of investigator**

*(In term of sanitation, techniques for construction, damaging; utilized level)*

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**Investigator**  
*(Signature)*

**Supervisor**  
*(Signature)*

## INSTRUCTIONS FOR IN-DEPTH INTERVIEWS AND GROUP DISCUSSIONS

Project Title: "KAP study on school sanitary constructions and control of worm infection"

### I. OBJECTIVES

1. Gather additional data that are insufficient or inaccessible in quantitative part:
  - To evaluate knowledge, attitude and practice on environment sanitation and control of worm infection of school children and their parents.
  - To see if the information on environment sanitation and control of worm infection come to the pupils.
  - To see if the information is transferred to families and community.
2. To forward recommendations in order to improve the management and performance of health education, safe water and environment sanitation programs.

### II. STRUCTURE & FORMS FOR GROUP DISCUSSIONS, IN-DEPTH INTERVIEWS

#### 1. Groups discussions:

- Title: group discussions  
Project title: "KAP study on school sanitary constructions & control of worm infection"
- Groups to be interviewed:  
Name:            age:            post:  
Time of the interviews:  
Place of the interview:  
Interviewers:  
Contents of the interviews

#### 2. In-depth interviews

- Project: "KAP study on school sanitary constructions & control of worm infection"
- Name of respondent:
  - Occupation:
  - Residence:
  - Time of the interview
  - Place for interview

– Interviewer:

Content of the interviews:

– Question 1:

– Answer:

– Question 2:

– Answer:

### III. DATA TO BE OBTAINED DURING THE INTERVIEWS

*The interviews are to be held for four groups of respondents:*

#### 1- Primary school children

##### **1.1. What do you perceive about school sanitation, safe water, environment sanitation and control of worm infection.**

- Knowledge and perceive the importance of the aforementioned issues.
- Components of school sanitation, safe water, environment sanitation & control of worm infection:
  - \* Excreta processing
  - \* Waste processing
  - \* Bowel movements
  - \* Influences of worm infection
  - \* Sources of worm infection
  - \* Measures for prevention of worm infection
  - \* Control of fly and other hazardous insects
  - \* Eating habit (drinking unboiled water, eating raw fruits, spoiled foods, etc.)
  - \* Personal hygiene
  - \* Others

##### **1.2. Where did you receive the information on safe water, environment sanitation and control of worm infection from?**

- \* School books, lessons at classes
- \* Practices at school
- \* Practices at home
- \* Youth activities, class activities
- \* Parents, relatives
- \* Local staffs
- \* Classmates



- \* Newspapers
- \* TV and radio
- \* Others

**1.3. Practices of primary school children on school sanitation, safe water, environment sanitation and control of worm infection.**

- + Do you participate in cleaning activities at toilets, classes and schools?
- + Do you write, draw on wall of toilets and schools?
- + Have you ever broken or damaged school sanitary facilities?
- + Do you participate in propaganda activities on school sanitation, safe water, environment sanitation and control of worm infection?
- + Do you have examinations for worm infection?
- + Did you take de-worming pills last year?
- + Do you talk to parents and relatives about the aforementioned issues?
- + Do you conduct any of the followings:
  - \* Use sanitary latrines
  - \* Drink unboiled water
  - \* Eat fruits without cleaning
  - \* Have food at school gate
  - \* Hand wash before eating
  - \* Hand wash after going to stool
  - \* Use soaps for cleaning
  - \* Regular nails cutting
  - \* Practice dental hygiene
  - \* Dispose wastes in public places
  - \* Assist other children in the families and neighbors to keep hygiene
  - \* Take part in cleaning activities at public places, residence areas, etc.

**2- Pupils; parents and community members (adults with no children attending primary schools)**

- **What do you perceive safe water and environment sanitation, control of worm infection? (see further in quantitative part)**
- Where did you receive the information from?
  - + Medical personnel, villages sanitation workers
  - + Primary teachers

- + Party leaders, local authorities, women's union, and youth union.
- + Pupils of primary schools
- + Other pupils or relatives
- + Books on health education
- + Practices at schools
- + Practices of their families, other places
- + Neighbors
- + Mass media (TV, radio, newspaper, etc.)
- + Perception of the need for school sanitation facilities.
- + Others sources
- **Practices of pupil's parents and community:**
  - + Do pupil's parents contribute to the construction of school sanitation facilities? If yes, at what degree?
  - + Do pupil's parents advise their children to keep the school sanitation clean, practice environment sanitation, safe water and worm infection control?
  - + Do pupil's parents discuss about school sanitation during meetings of pupil's parents?
  - + Do pupil's parents have regular contacts with teachers, school administrators to discuss about the learning and study and hygiene practices of their children at schools?
  - + Do your family have sanitary latrines, places for passing water?
  - + How do you process waste, excreta, urine of people and animals?
  - + What sort of water do you use for drinking and bathing? Is the water clean?
  - + Do you take de-worming pills annually?
  - + Are there anybody suffering from any of the following:
    - \* Abdominal pain caused by worm
    - \* Food borne diseases
    - \* Trachoma
    - \* Scabies, fungus
    - \* Other disease due to worm infection or infection of skin, digestive system, etc.
  - In your opinion, what should be done to keep sanitary and protect safe water sources and control worm infection for:
    - \* Your children and families?
    - \* The schools?
    - \* The community?

- The socio-economic factors and practices that hinder good implementation of environment sanitation programs and control of worm infection?

### 3- Teachers

- What do teachers perceive environment sanitation, safe water and control of worm infection?

+ Effects these issues on well-rounded education.

+ Issues that need attention (see further in quantitative part).

- Activities of teachers in the aforementioned area:

+ Do teachers integrate content on environment sanitation, safe water and control of worm infection in lectures? If yes, what component?

+ Do teachers put contents on environment sanitation, safe water and control of worm infection in meeting of classes, youth movement, etc?

+ Do teachers talk to parents and other community members about the aforementioned issues?

+ Do teachers request leaders of schools, education sectors, local authorities on issues relate to environment sanitation, safe water and control of worm infection?

+ Are water and sanitary appliances for drinking available at the school?

+ Are there sanitary constructions with proper quality at school? (see criteria in quantitative part)

+ Are school sanitation, environment sanitation, control of worm infection considered the criteria for emulation?

+ Are there any sanitary construction for waste disposing?

+ Do pupils take part in propaganda and cleaning activities with local people?

+ Influences of school on local people?

- Do teachers have request on any of the following:

+ School sanitation, environment sanitation, protection of safe water and control of worm infection?

+ The role of schools in these tasks?

- Socio-economic factors that hinder good performance of work on environment sanitation, safe water and control of worm infection in the localities?

+ Economic

+ Social

+ Leadership

+ Education

+ Others

#### 4. Local authorities:

- Importance of school sanitation, environment sanitation, safe water and control of worm infection in the context of other socio-economic matters that need attention at the localities? (versus other issues such as poverty alleviation, school dropping out, diseases, etc). Are these matters should be given priority?
- Local policies for construction & protection of sanitary facilities? (funding, community contribution, contribution of laborers, supervisory, etc.)
- Do party's leader, local authorities give any directions on school sanitation, environment sanitation, safe water and control of worm infection? If yes, at what degree? Who are the cores for the work?
- Are sanitary constructions available at public places of the commune? If yes, what is the availability?
- Do all families in the commune have access to sanitary latrines? What is the situation of waster disposing in the commune?
- Work done in the area of for food control? What is the current situation like?
- Percentage of population have access to safe water? What are the sources?
- Solutions for safe water, environment sanitation and control of worm infection?
- Socio-economic obstacles of the aforementioned solutions?
- Recommendations to improve performance on:
  - + School sanitation
  - + Protection of safe water
  - + Environment sanitation
  - + Control of worm infection

## CHECKLIST FOR SCHOOL SANITATION FACILITIES

School:

Sanitary facilities:

Year of construction:

No.	Observe criteria	Yes	No
1	<ul style="list-style-type: none"> <li>– Clean sanitary facilities</li> <li>– Sanitary facilities not clean</li> </ul>		
2	<ul style="list-style-type: none"> <li>– No foul smell</li> <li>– Foul smell</li> </ul>		
3	<ul style="list-style-type: none"> <li>– Few flies</li> <li>– Many flies</li> </ul>		
4	<ul style="list-style-type: none"> <li>– Water pumps work</li> <li>– Water pumps don't work</li> </ul>		
5	<ul style="list-style-type: none"> <li>– Enough water for flushing</li> <li>– Lack of water</li> </ul>		
6	<ul style="list-style-type: none"> <li>– Door flaps sufficient</li> <li>– Doors flaps insufficient</li> </ul>		
7	<ul style="list-style-type: none"> <li>– Enough waste paper bin</li> <li>– Waste paper bin insufficient</li> </ul>		
8	<ul style="list-style-type: none"> <li>– Enough water containers for flushing</li> <li>– Dipper water containers for flushing</li> </ul>		
9	<ul style="list-style-type: none"> <li>– Latrine's flooring in good condition</li> <li>– Broken latrine's flooring</li> </ul>		
10	<ul style="list-style-type: none"> <li>– No latrine obstructed</li> <li>– Some latrines blocked</li> </ul>		
11	<ul style="list-style-type: none"> <li>– Waste water discharged rapidly</li> <li>– Waste water stagnant and dirty</li> </ul>		
12	<ul style="list-style-type: none"> <li>– Places for passing water usually utilized</li> <li>– Places for passing water rarely utilized</li> <li>– Places for passing water never utilized</li> </ul>		
13	<ul style="list-style-type: none"> <li>– Latrines usually utilized</li> <li>– Latrines rarely utilized</li> <li>– Latrines never utilized</li> </ul>		

### Remarks of investigator

*(In term of sanitation, techniques for construction, damaging; utilized level)*

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Observer's signature