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ENVIRONMENTAL SANITATION AND
DOMESTIC USE OF WATER

in three communes of Vietnam

For Discussion

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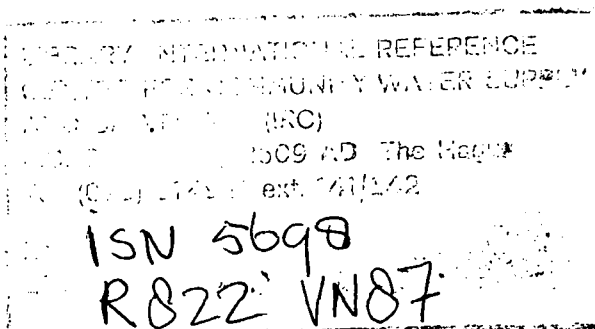
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I. INTRODUCTION

Public programmes aiming at improving environmental sanitation and hygiene are not novelty in Vietnam. More than thirty years ago, in 1956, the Government started allocating resources and providing technical advice to the people in this field.

In recognition of the importance of adequate environmental sanitation and hygiene, UNICEF has been assisting the Government of Vietnam in this area since 1975, when it began supporting activities in the country.

UNICEF assistance has focused in improving environmental sanitation and personal hygiene in the country as well as controlling epidemics and water and excreta related diseases to which children fall often as the first victims. Prevention of transmissible diseases by cutting their transmission routes has been the strategy adopted.

The first UNICEF assistance of this nature was of the emergency type : providing cement and iron bars at a national level, for lining wells and for building latrines. In the rural areas of Vietnam UNICEF assisted to construct 100.000 Double Vault Compost Latrines, together with the construction and/or renovation of 50.000 wells.

Since 1980 UNICEF assistance has been concentrated in rural areas. The policy has been to assist planning and training activities at the national level, but to stress actual implementation only in priority districts of six provinces: Long An, Minh Hai and Kien Giang in the Mekong Delta and Thanh Hoa, Nghe Tinh and Ha Nam Ninh in the Northern part of the country.

1980 and 1981 were largely used for programme planning and in mid 1982 a National Committee for Water and Sanitation was established to pursue the goals of the International Water and Sanitation Decade. In 1983, coordinating Committees for water and sanitation were established in each of the provinces where UNICEF assistance is concentrated, under the supervision of the Ministry of Health.

During 1985 two National Seminars were held to work out the plan of activities for the coming four years. By that time, three main activities were defined for the programme on sanitation: (1) participatory health education training courses and educational activities that include the development of audiovisual aids like pamphlets, flipcharts, posters and films. (2) The Intestinal Parasite Control programme as an entry point for the programme and to raise awareness of the people on excreta related diseases. It includes mass stool examination and treatment for children between two and fifteen years old twice a year. And, (3) the assistance to environmental sanitation improvement in its physical conditions by providing with iron bars and cement.

As a complement to the main activities it was foreseen the need to study the practices on sanitation and water supply to know and understand what people do, what they think and what they want in regard to sanitation and use of domestic water. This report presents the results of the San

This report presents the results of the Sanitation Household Survey implemented during May, June and July 1986 in the three pilot communes of Ha Nam Ninh, Thanh Hoa and Nghe Tinh in North Vietnam, which was conducted as part of the Plan of Action-1986 in UNICEF's Sanitation Programme.

Although, as mentioned above, the Vietnamese Government has been spending since 1956 economic resources and providing technical advice to improve sanitation conditions the impact in the health of the people has been much less than foreseen. Excreta related diseases 1/ continue to be an important component in the children's morbidity of Vietnam. Many of these diseases can be prevented and are basically due to a poor environment including polluted water. Eventhough reliable detailed data on morbidity for the communes under study do not exist, the results on Intestinal Parasite Control on Table No.1 can be used as an indicator of diseases related to a poor environmental sanitation.*/

1/Feechem et.al. Environmental classification of excreta related infections, Annex #1

*/This activity was implemented by the Ministry of Health and UNICEF Sanitation Programme during 1986 in the three pilot communes under study.

TABLE No. 1

Results of the stool examination for children between 2 and 15 years old

	Ascaris	Hookworm	Tr.Trichura	Total cases
My Tho Ha Nam Ninh	99.4%	9.1%	21.8 %	1353
Quang Chau Thanh Hoa	97.7%			1701
Quy nh Doi Nghe Tinh	94.4%	1.4%	24.1 %	2979

In My Tho more than half of the examined cases were found with two different kind of worms, while this figure was found to be 30% in Quang Chau and 20% in Quy nh Doi. Almost all the population appears to be infested with soil transmitted helminthiasis, specially ascaris.

Infestation with soil transmitted helminthiasis affects the occurrence of diarrhoeal diseases and low nutritional levels. The figures of the CDD annual report in 1985 for the provinces under study, indicates an average of around 3.0 diarrhoeal episodes per year for children under 5 years old.

Without a basic change in the sanitation conditions a major reduction in these diseases cannot be expected. Nevertheless, although sanitation facilities - as provision of toilets- are necessary, they are not by themselves a sufficient condition for improving the people's health.

In fact, in addition to providing sanitation facilities there is the need for educational programmes aiming at changing people's mind and behavior in sanitation. The educational objectives are clear: that mothers feel the necessity of maintaining clean the latrine to avoid reinfection of parasites in children; that community leaders stress the advantages of composting excreta; and that through the socialization process children acquire new hygienic habits. But the still unsolved problem is how to reach these objectives.

Planning for education requires to know what people think about and which their felt needs are. For this reason the present study besides inquiring on prevailing physical conditions, goes also into knowledge, practices and needs on sanitation and on the use of domestic water.

This study, exploratory and descriptive in nature, is the first effort of this kind conducted in Vietnam. The findings presented and discussed in the following sections refer to only part of the data collected. Information dealing with Family Planning, or Way of treating diarrhoeas will be analyzed in future reports.

In the future the same questionnaire will be used for evaluation purposes. Through the analysis of some key questions related to hygienic customs and maintainance of the sanitary facilities and water sources, it will be possible to measure the effect health education and the sanitation activities in each commune. The impact on the people's health should be done through a health indicator like nutritional levels or the occurrence of excreta related diseases.

Acknowledgements

Finally, I would like to express my acknowledgment and gratitude to Mr. Paul Audat, UNICEF Representative in Vietnam, who supported from the very beginning the idea of conducting this survey and, with his valuable advice, allowed us to improve the questionnaire. My gratitude as well to the Sanitation team in UNICEF for their permanent support and particularly to Dick Van Ginhoven former Programme officer, under whose leadership the survey was conceived and developed; to Mr. Quhnh who helped me not only with translation but also to understand the customs of Vietnamese people; to Mrs. Phuong who carried out part of the computer work and to Bernard Gilbert, coordinator of Water Supply and Sanitation Programme in UNICEF, who helped me in reviewing the final report.

II. OBJECTIVES

1. General Objectives :

The basic purposes of the study are to describe the prevailing conditions regarding water supply and sanitation, as well as to explore the way in which the people think about and behave in connection with environmental sanitation and the domestic use of water. The findings are expected to be used as in-puts for planning of sanitation activities as well as for health education.

2 Specific Objectives :

- a. To up-date information on physical conditions of sanitary facilities and water supply for domestic use.
- b.. To collect information refering to hygienic habits in sanitation and in the use of domestic water.
- c. To explore on the needs and preferences of the people in sanitation and water supply.
- d. To study practices in sanitation that affects people's health (like use of fresh excreta for manure or defecation practices).
- e. To identify the socialization agents in the family with regard to domestic use of water and defecation practices.
- f. To inquire on the knowledge and believes of the people about excreta related diseases and water transmitted diseases.

III. METHOD

1. Survey Design

In order to fulfill the above objectives, a survey was designed to be applied to a Random Sample of 15% of the households on each commune. The main instrument was a questionnaire containing 65 questions, most of them closed and precodified, which was applied to the woman head of the household, or the wife of the head of the household.

Complementary information was collected through a Baseline Survey at communal level and indepth interviews to the whole family.

2. Instruments

In this study the following three instruments to collect information were applied:

a.. Commune Baseline Data

General data of the commune referred to education and demographic characteristics, health and economic conditions. This information was provided by the head of the Health Station.

b. Questionnaire :

Besides the questions addressed to the women head of the household, complementary information was obtained through direct observation on housing conditions and water and sanitation facilities. (See the questionnaire in Annex #2)

Through the questionnaire information dealing with the following variables was collected:

General Information:

- Size of the Household
- Type of Family
- Total number of children
- Education
- Occupation

Diarrhoeal Diseases:

- Sickness of children less than 5 years old in the last 2 weeks.
- Way to treat diarrhoeas
- Occurrence of diarrhoeal diseases, specified by season
- Person who taught how to treat diarrhoeas
- Reason for having diarrhoeas
- Way of preventing diarrhoeas in children

Domestic use of Water:

- Water source for drinking
- Water source for cooking
- Water source for cloths washing
- Water source for bathing
- Availability of water during the year
- Cost of water
- Provider of water
- Quantity of water used per day
- Time spent to obtain water
- Distance from water source to the house
- Custom of boiling water
- Kind of Diseases transmitted by water contamination
- Presence of soap for handwashing

Sanitary Facilities

- Ownership of a latrine
- Number of people using the latrine
- Place for defecation
- Material used for cleaning after defecation
- Custom of handwashing
- Knowledge on diseases transmission
- Way of diseases transmission
- Age when children start using the latrine
- Knowledge on offensiveness of children's stools
- Place where children defecate before using the latrine
- Problems for children using latrine
- Person in charge of training children in the use of the latrine
- Frequency of cleaning the latrine

- Person in charge of cleaning the latrine
- Ownership of a bathroom
- Use of soap for bathing

Human Excreta Disposal:

- Use of fresh excreta for manure
- Opinion on the use of excreta for manure
- Time used in composting excreta
- Way of composting excreta

Double Vault Double Latrine (D.V.C.L.) :

- Time to fill one vault with excreta and ashes
- Person in charge of carrying fertilizer
- Person in charge of spreading fertilizer

Animal Excreta Disposal :

- Kind and number of domestic animals at home
- Way of disposing animal's excreta
- Garbage Disposal

c.. In-Depth Interviews :

For each commune a total of 30 interviews were carried out. An oriented discussion with the family that allowed a deeper understanding of behavior pertaining to domestic use of water and defecation practices. It gave the opportunity for the surveyors to practice face- to- face education.

While preparing the questionnaire, pretesting was done in the communes so as to improve the instrument and to assure questions were viable and comprehensive to the people.

3. Sample

The people's Committee in each commune was introduced how to prepare a Random Sample. 15% of the households of each commune were selected; i.e. around 150 households per commune.

4. Fieldwork

a. Selection and Training of Surveyors:

The same participants in the training course in Health Education, many of them already involved in sanitation and water supply activities, have acted as surveyors. All of them came from communal level similar in social and cultural background as the population under study.

The team was multidisciplinary: Health workers, teachers and monitrices, and members of the People's Committee, the Women's Union and the Youth Union.

During the selection of the surveyors the importance of involving women from all levels and specially those dealing with mother and child activities was emphasized, since women are playing a major role as acceptors and promoters in sanitation. As acceptors they are primary users of sanitation facilities, principal water carries and agents of socialization. As promoters, women have proven to be the most effective communicators in programmes dealing with the health of mother and child.

The importance given to teachers and monitrices relies on the consideration that a change in hygienic and defecation practices will take place only when children change their behavior. Children are principal agents in the transmission of values since they are mostly in charge of daily caring of siblings, and helpers in drawing water.

Training of the surveyors was based more on practical work than in formal lectures. At a first stage the objectives, purposes and methodology of the survey were explained to them, as well how to conduct interviews and observations and how to fill in the questionnaire. Latter on, practical work with participants interviewing each other was done during the two following days. Before going to the field each of the participants carried out at least four questionnaires, two observations, and one interview.

b. Fieldwork Implementation

The fieldwork was done during 3 days in each commune. The People's Committee assigned 10 dwellings to each of the 15 teams formed each one of them by a woman who applied the questionnaire and a man who was in charge of the observations.

Herewith is the information on the total population and the sample actually covered by the Sanitation Household Survey implemented in the three communes :

TABLE No. 2

Number of surveys implemented

Communes	No of hou.	BaselineData	Ques.	Obser.	Inter.
My Tho (Ha Nam Ninh)	890	1	157	157	30
Quang Chau (Thanh Hoa)	962	1	152	152	30
Quynh Doi (Nghe Tinh)	838	1	154	154	30

During the days of implementation of the survey two daily meetings were held. In the morning all material was distributed and checked, and households assigned. At the end of the afternoon, when work was completed, participants interchanged experiences and raised problems. The questionnaires were collected and reviewed in order to assure all information was completed.

IV. GENERAL CHARACTERISTICS OF THE COMMUNES

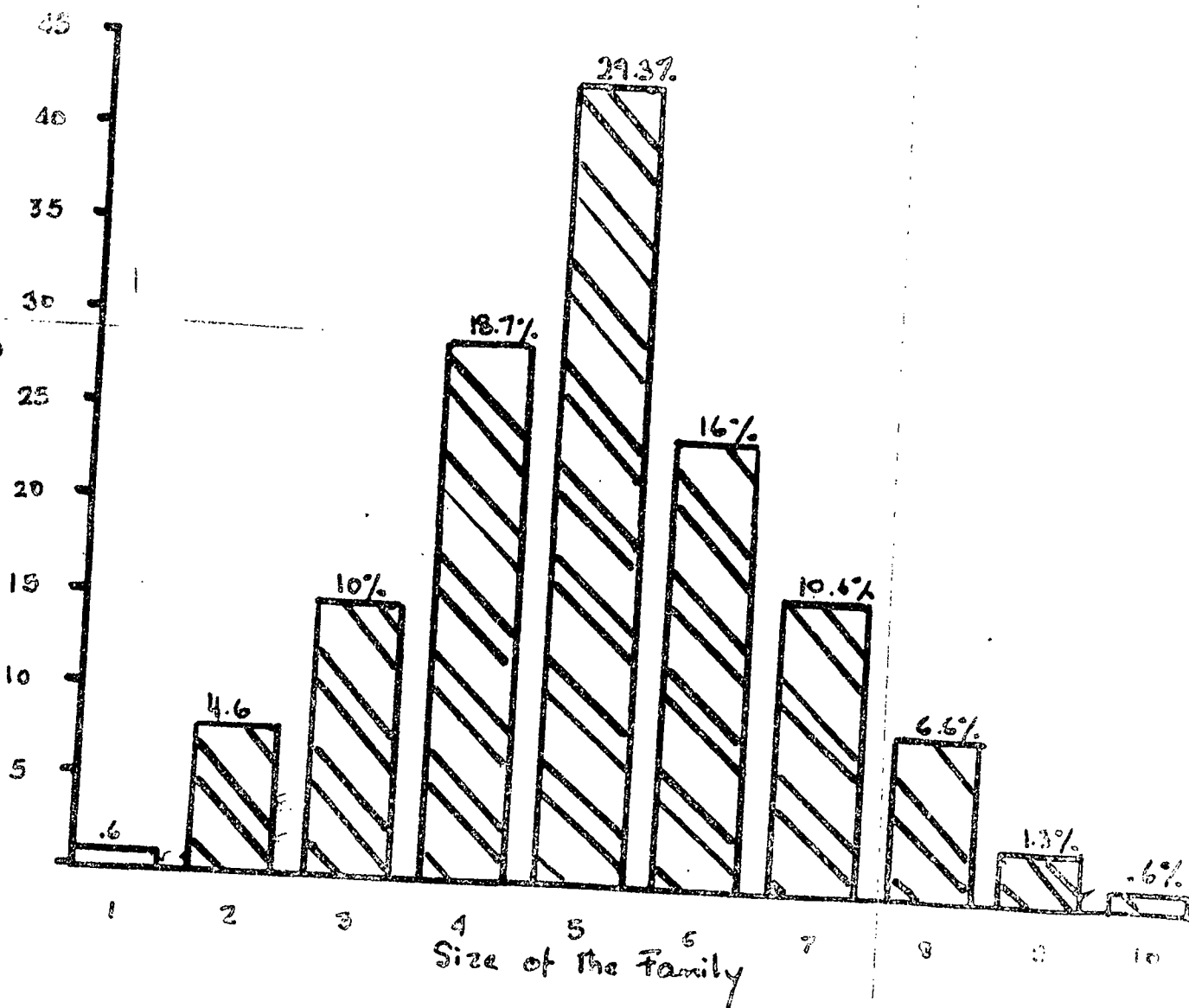
1. MY THO - HA NAM NINH Province

a. Population

According to the data provided by the Health Station for 1986, in the commune there was a total number of 890 households. The average size of the families are of 4.7 members. (Table No.3)

Table No.3

MY THO: Size of the Family



b. Economic Activity

My Tho is an agricultural commune, composed of five hamlets. Most of the production is centered in rice with two crops per year.

For all the communes under study production relies on the family as a unit. The People's Committee jointly with the Communal Collective Farm, defines the quota of rice to be produced and assigns a portion of land, according to the economic labour force of the family and to the quality of the land.

An additional small portion of land allows the family to produce in a parallel way vegetables for the consume of the family and for private trading.

The quota to be reached per crop is not high, considering possible natural catatrophes as typhoons or floods. After completing this quota, the excedent is for the private use of the family.

The commune is divided in 13 working brigades. They reagroup some number of families and are responsible for advicing and organizing agricultural activities. Through them, families receive, when needed, tractors, chemicals for fertilizer, etc.

c. Education

Around 70% of the adults completed basic education (approximatly 9 years of study). My Tho counts with one basic school for 850 students, 4 creches for 140 children and 3 kindergardens for 120. Creches and kindergardens work full day with a rest for lunchtime, while schools work in two time tables.

d. Housing

Around half of the houses are built with permanent materials like bricks, and cement with tiled roofs. Only 10% of the houses have wattle and daubed walls with thatched roofs, the rest have a combination of permanent and wattle materials.

The average number of rooms is two, with a special place for the kitchen. Infront of the houses there is a cement plaque for drying and selecting the rice. The shed for domestic animals is aside, mostly builded with perecible material.

Houses inside are clean, with good ventilation; uncleanliness is present outside due basically to a bad drainage system, and to garbage disposal.

e. Health Facilities

The commune has a Health Station with 15 health workers, 8 of which collaborate with the working brigades. My Tho, participates in IPC (Intestinal Parasite Control), CDD (Control of Diarrhoeal Diseases), WFP (World Food Programme) EPI (Expanded Programme for Immunization) and Water supply Programmes.

According to the data provided by the Health Station, 13% of the consultations were due to diarrhoeal diseases */ Other diseases related to a poor environmental sanitation like eye infection raised up to 40% of the children during summer time. 95% of the children between 2 and 15 years presented infestation with soil transmitted helminthiasis.

2. QUANG CHAU - THANH HOA Province

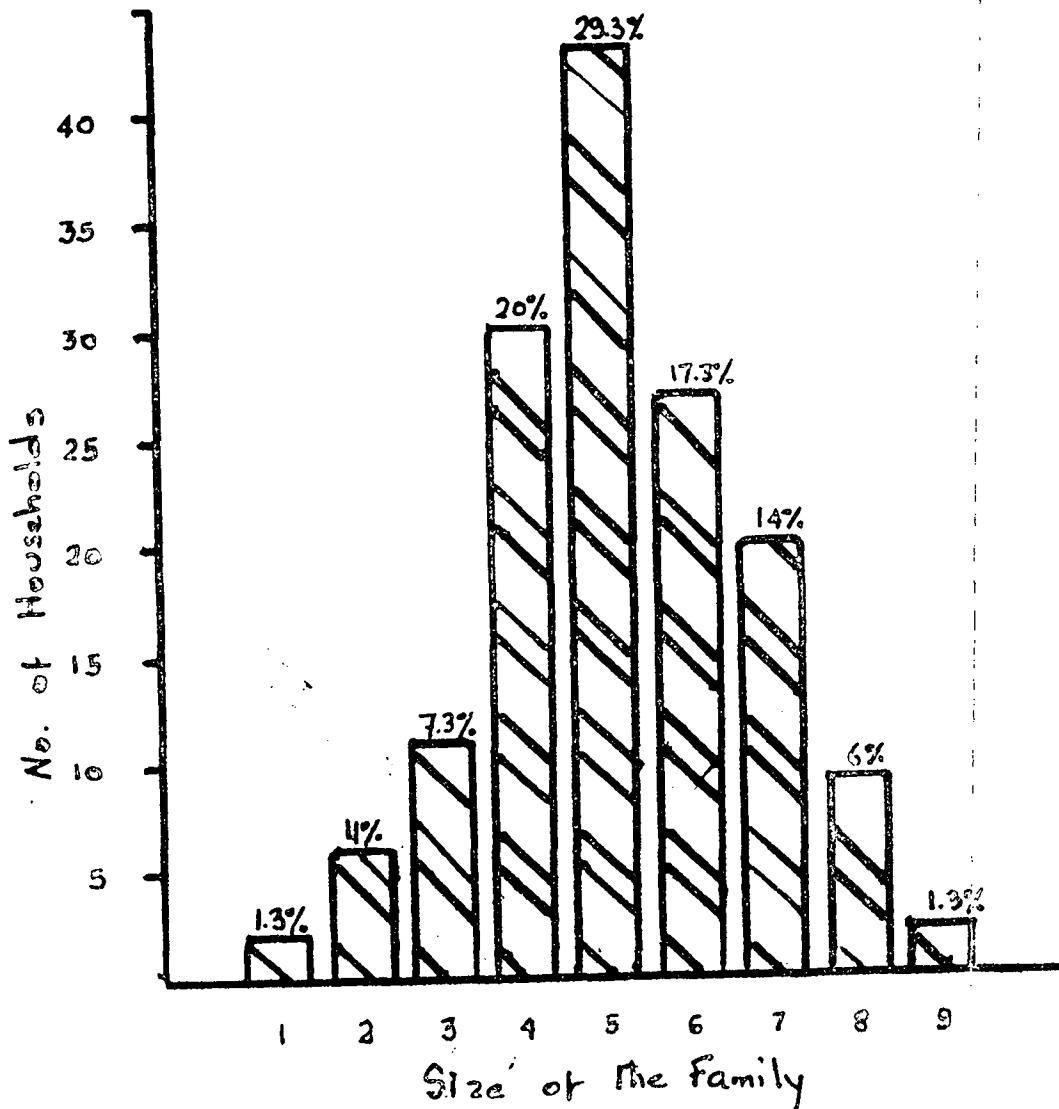
a. Population :

As per data provided by the Health Station there were 992 households in the commune with an average size of 5.7 members and a total population of 5721 inhabitants. (Table No.4)

*/ The occurrence of diarrhoeal diseases appears basically during the end of the dry season when water is scarce and when big amounts of fertilizer is used.

TABLE No.4

QUANG CHAU: Size of the Family



b. Economic Activity

Quang Chau has a total cultivated area of 374 hectaers of which three quarters are used for rice production.

They produce two main crops per year and one secondary crop. The highest need for fertilizers happen during January and February, June, July, and October, November.

There are 13 working brigades in the commune with a total labour force of 1350 people.

c. Education

Quang Chau has one basic school for 1110 pupils, 5 kindergardens for 260 children and 5 creches for 170 infants. A total of 48 teachers for the school, 8 for the kindergarden and 24 monitrices.

d. Housing

Almost three fourths of the houses are constructed with permanent materials.

People are private owners of their houses. Cleanliness and size of the house constitutes a source of prestige. It is common to find clean and careful organized dwellings. Uncleanliness is due to the animal's shed, lack of drainage or improper disposal of garbage.

Most of the houses have two rooms with a separate space for cooking. No storage food was seen, except for rice that is kept in cement tanks.

e. Health Facilities

There is one Health Station in the commune, with 6 health workers and one midwife. When needed patients are refered to District or provincial hospitals; the latter of which is 11 km. from Quang Chau.

No statistics were available to draw the health profile of the commune, but as per health workers, the frequency of excreta related diseases seems to be high.

Quang Chau participated twice in the IPC programme. The first deworming for children between 2 and 15 years old, at the end of 1985, showed an infestation of 96%, most of them with ascaris.

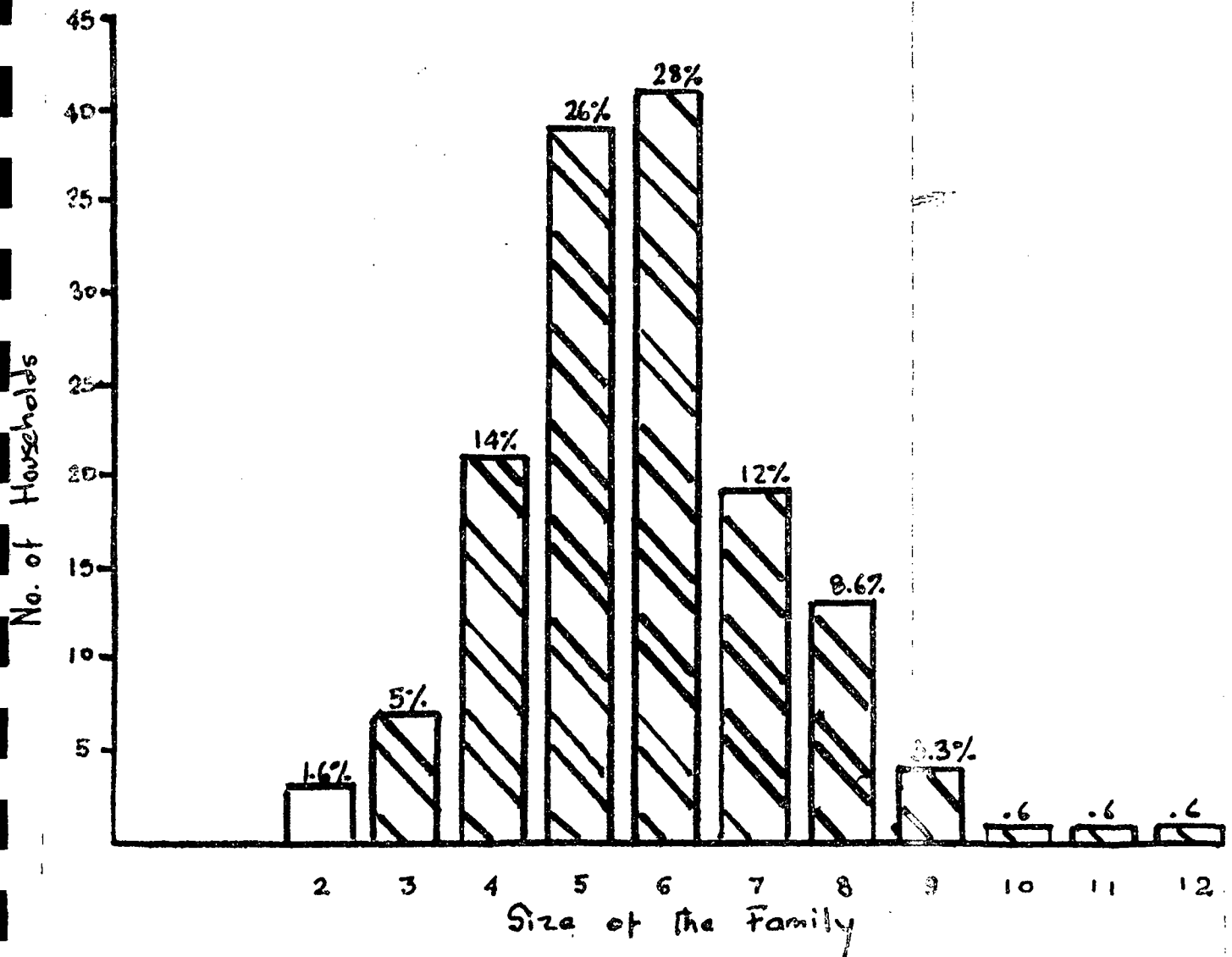
3. QUYNH DOI - NGHE TINH Province

a. Population

The total population is 3927 inhabitants with 838 households and an average size of 4.7 members per family, distributed in eight hamlets. (Table No.5)

TABLE No. 5

QUYNH DOI: Size of the Family



b. Economic Activity

In Quyhn Doi, as in the other communes, rice production is the main economic activity with two crops per year. There is also continuous production of vegetables and coconuts.

A source for complementary income is the raising of pigs, chicken and ducks that can be found in almost all dwellings.

c. Education

This commune has one basic school for 972 students, 4 creches for 250 infants and 200 children in the kindergardens.

The school works with two shifts per day, while kindergardens and creches during the whole day as a support for the working mothers.

d. Housing Conditions

65% of the houses are built with permanent materials, and tiled roofs. The rest of the houses combine permanent materials with thatched roofs.

A characteristic of this commune is their hygienic habits that can be seen in the cleanliness outside and inside the house, and on a better maintenance of the animal's shed. They count on a special tank for pilling garbage and on a drainage system.

e. Health Facilities

The commune has one Health Station with 15 health workers, 8 of which work continuously in the working brigades. The district hospital is located at a distance of 5 kilometres, far from Quyhn Doi.

Preventive activities like CDD and EPI have been carried in a successful way. An example of how active and supportive the commune is, in IPC programme deworming is that besides children, adults were also included. Stool examination presented high rates (95%) of infestation among the children, specially with ascaris.

V. ECONOMIC AND SOCIAL ORGANIZATION OF THE FAMILY

1. Economic Organization of the Family

Extended families prevail in rural areas, where all members play an important and defined economic role. For all the communes under study the extended family was present in around half the households.

Men are in charge of heavy work like carrying excreta for fertilizing from the house to the paddy fields; ploughing and transporting rice during harvesting. Women play a major and active role in economic activities. They plant, transplant, weed, irrigate, fertilize and harvest the rice with the help of their children.

Children while not in school are in charge of the water buffaloes and of minor agricultural activities.

During harvesting time the family will count on the work of all its members, even on the assistance of other families belonging to the same working brigade.

The vegetable garden and the raising of domestic animals is main responsibility of the old people. Trading activities generating additional income are mainly in charge of the old women of the family.

2. Social Organization of the Family

The families are patrifocal and the man head of the family (or his widow) is the owner of the household.

When daughters get married, they leave the parents dwelling and move to live with her husband's family. On the contrary, when a son marries, he stays in his parents place until he is able to become economically independent, and he brings his wife to live in his parents household. Furthermore, when they settle in a new house it will be proximate to the parents house.

Sons more than daughters are expected to take care of their parents when they become old. Because of these traditional customs, sons are considered more valuable than daughters from an economic and social point of view.

In the extended families the first generation maintains its authority in the family, even when they become old, they play a central role in main domestic decisions. They prepare food, take care of small children and care for domestic animals. Since they stay at home, the old people (grandparents) play a major role in the children's socialization process.

Children in school age, while not helping in the fields, are in charge of smaller siblings, fetch water and collect wood for cooking.

VI. SANITATION

1. Sanitary Facilities

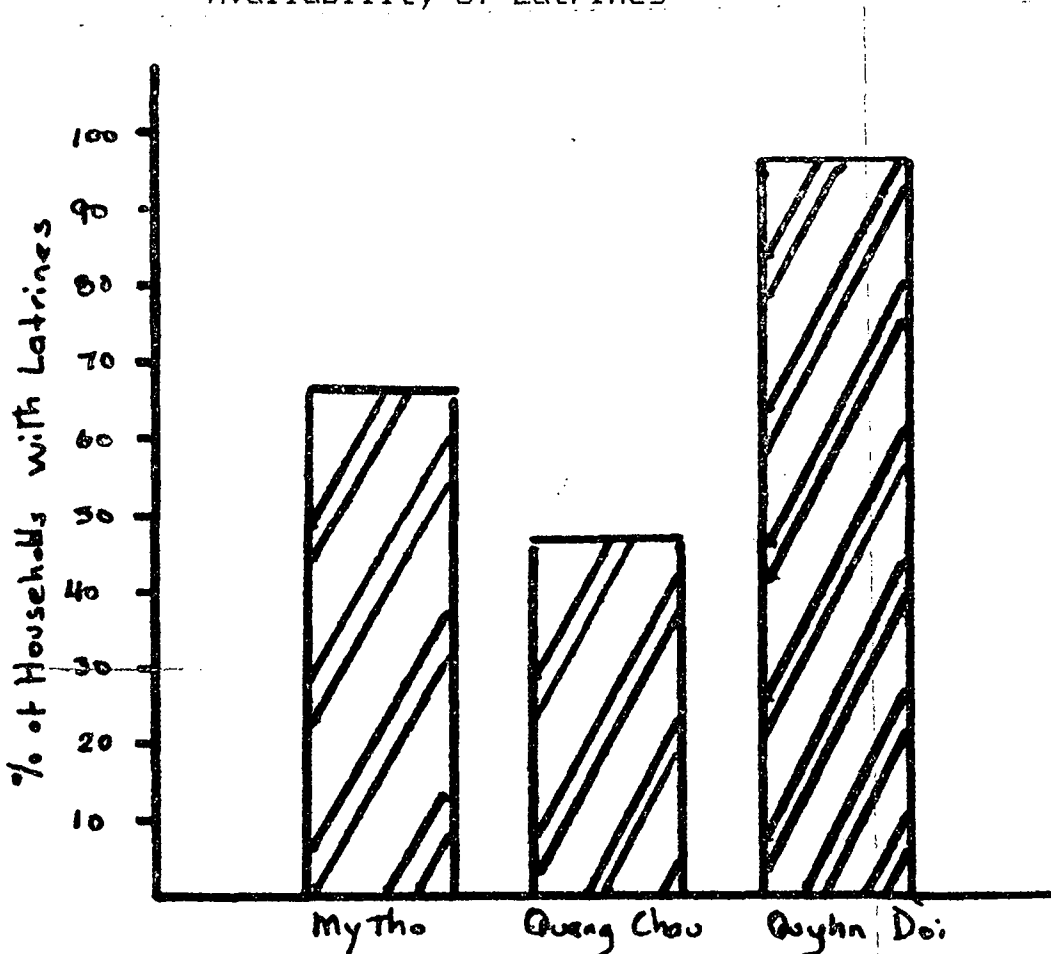
a. Kind of Latrines

At the time of the survey in the commune of My Tho, around 70% of the households have a private Double Vault Compost Latrine (D.V.C.L.) half of which are in good sanitary condition. (Table No.6.

As part of Sanitation Plan of Action, from mid 1985 to the end of 1986, 100 new latrines and 5 septic tanks were constructed and 42 D.V.C.L. latrines were repaired. The goal was to build 340 new sanitary facilities of which only one third was fulfilled.

TABLE No. 6

Availability of Latrines



In Quang Chau by 1985, a year before the survey was conducted, there was a total number of 340 one vault latrines, corresponding to 34% of the households. Most of these latrines were in very poor sanitary conditions basically due to the use of percieble materials in their construction. The goal pursued by the Sanitation Programme for 1986 was to build 962 new latrines. By the end of 1986 only one third of them had been built. By the time of the survey still less than half of the families had a latrine. As seen in table 6, of the three communes under analysis this is the one with the lowest rate of sanitary facilities per household.

Quynh Doi differs from the other two communes, becoming an example of sanitary improvement. Before the sanitation programme started, although 70% of the households had a sanitary facility, only one fifth of them were in good physical and hygienic conditions.

By November 1986 almost all the households in the commune had a private latrine in good conditions (table 6). During field visits to the commune, it was noticed how the good maintainance of the new facilities constituted a new social symbol of prestige.

b. Distance

When having a private latrine, the average distance from the house to the latrine is of 10 to 15 mts.. The facility is located at the back of the house. No cases were seen where the sanitary facility was found inside or next to the dwelling.

People are used to constructing the well, the latrine and the bathroom rather closed each other, which can increase the risk of contamination of the water source for domestic use.

c. Physical Conditions of the Latrines

As mentioned above Quynh Doi distinguishes for having improved its environmental conditions, by an appropriate use of the D.V.C.L.

Latrines built in bricks and cement are kept usually in better hygienic conditions; latrines that need to be repaired or are constructed in perecible materials are seen in poorer sanitary conditions. It seems that the use of light, perecible materials for building latrines leads to a vicious circle: the fast deterioration of the latrine makes people less interested in the maintainance of the latrine what incides in dirtiness, and as well uncleanliness affects the quicker deterioration of the latrine.

Contrasting with Quyhn Doi, in My Tho and Quang Chau only one third of the households have latrines in good, clean conditions while in the rest of the houses the latrine constitutes an area for mosquitoes breeding where faecal pollution is found in the floor and near the latrine. The slab is usually muddy, with bad smell, and the access doors open. In some cases, neither container with ashes nor a urine container was available.

2. Practices Relevant for Sanitation

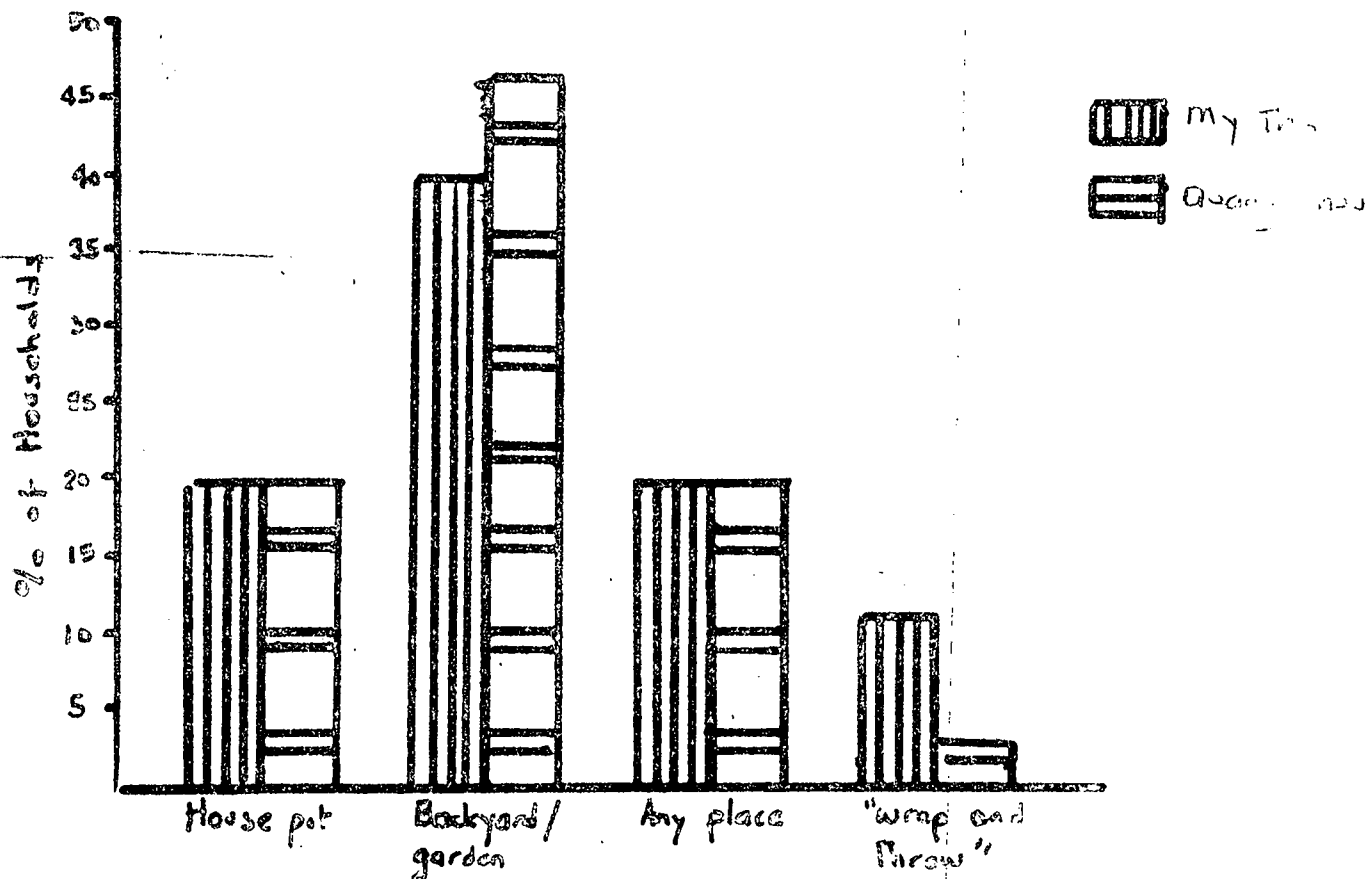
a. Defecation Practices

There is no difference in defecation practices between sexes. Among adults there is not the habit of open defecation. Whenever at home, they use the latrine, and it was noted that it is in the morning when both men and women go to the latrine, before leaving to the field. Since adults spend most of the day in the paddy fields, far from the house, urination will be done straight in the field.

Children follow a different pattern which varies according to their age. Smaller children tend to defecate freely in the backyard or in the garden (table No 7). At an early age, before two, the child will defecate with the help of the mother or grandmother. When not naked, boys and girls wear trousers with a hole that permits easy defecation and urination. During the field visits, it was seen mothers seating on their legs and providing accomodation for the child to squat. The child defecates straight to the ground. Paper or leaves are used for cleaning after defecation, but not water for hand washing is used afterwards. The "wrap and throw" method, where defecation is done on some leaves and then disposed, seems to be an uncommun practice.

TABLE No. 7

Defecation Place for Children, before using the Latrine



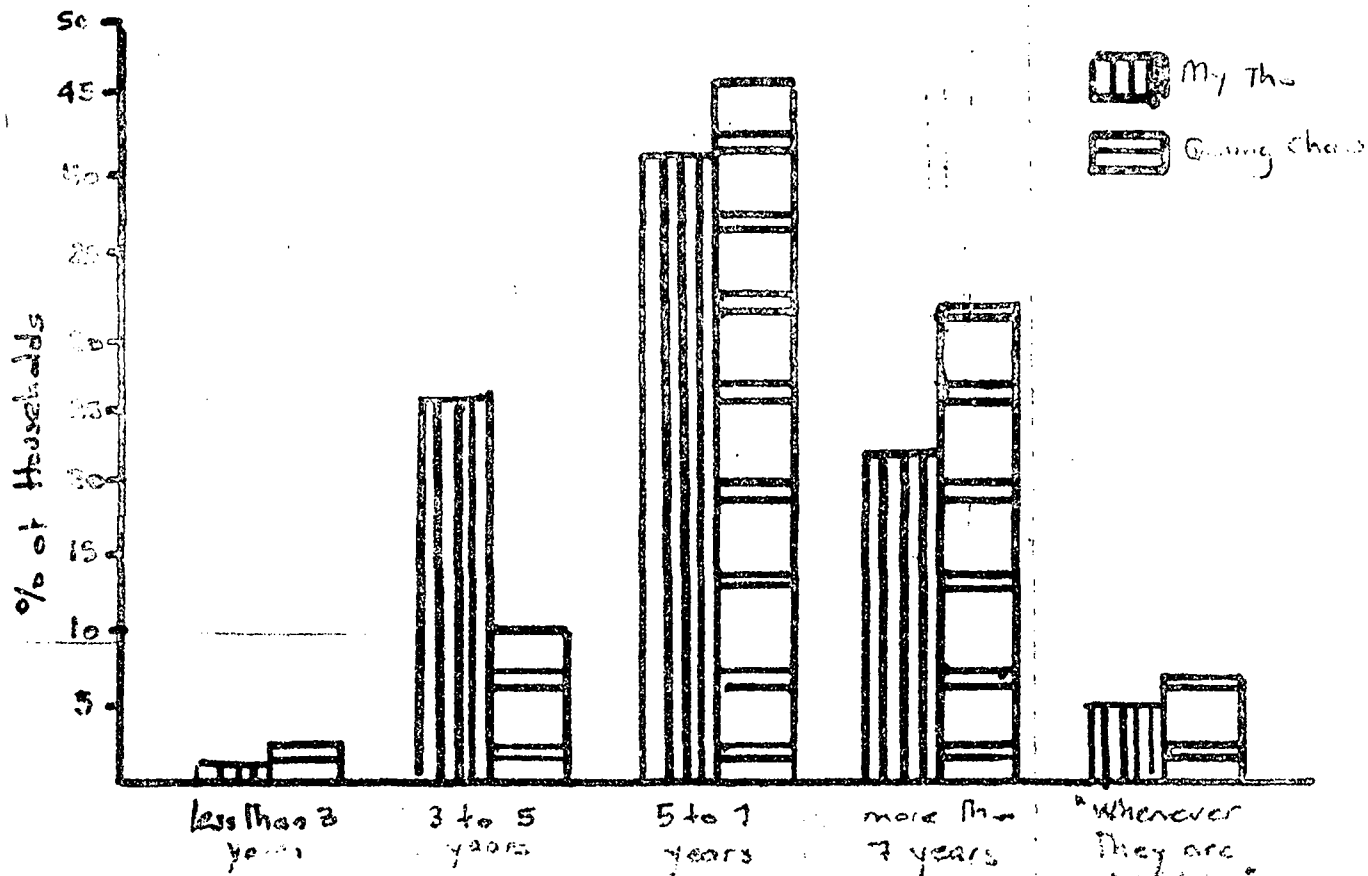
At early age children learn to defecate on the ground with the mother's assistance. This process continuous until the child can squat freely to defecate without anybody's support.

From age 2 to 7, children were seen defecating in the garden near the house, or in the field, without any proper disposal of the fecal pollution. Only when children reach the age of seven (Table No. 8) mothers or grandmothers consider that they are mature enough to start using the latrine. Before this age mothers justify the open defecation due to the darkness of the latrine, its bad smell or the long distance from the house.

Even though mothers know that children's stools are an important factor of environmental contamination, they continue supporting the same behavior during the socialization process when there is no restriction on open defecation habits.

TABLE No. 8

Starting Age to use the Latrine

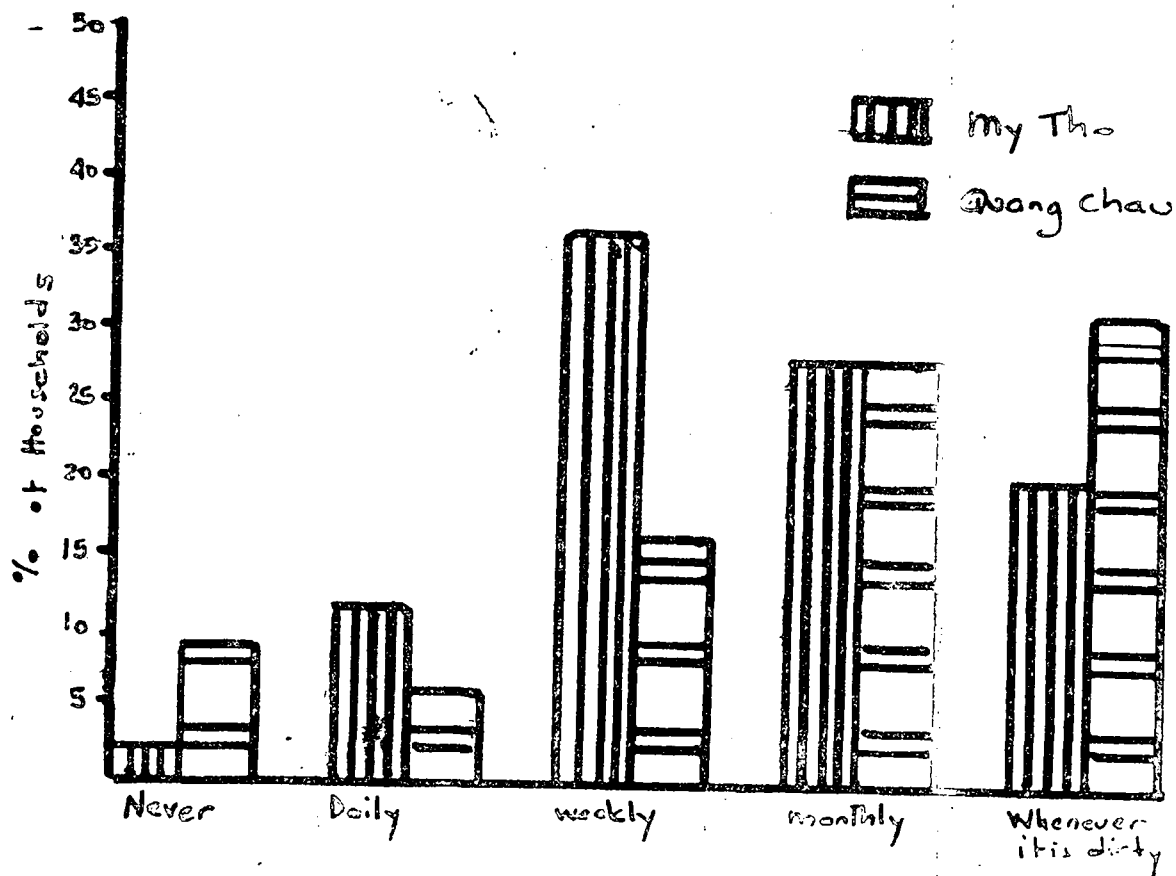


b. Personal Hygiene

When no private latrine facilities are available, and since there are no public latrines in rural areas, people will visit the neighbor's latrine. This fact affects the cleanliness of the latrine where visitors are totally irresponsible for its state and do not share cleaning activities with the owner.

According to table 9, in less than 10% of the cases the family is used to cleaning the latrine in a daily basis. One third of the women interviewed in My Tho said to clean their latrines weekly, while in Quang Chau in most of the cases cleaning is done monthly or "whenever is dirty".

TABLE No.9
Frequency in Cleaning the Latrine



There is not a habit of maintaining clean the latrine as it is the case with the house. The latrine is not considered an important part of the house. There is no embarrassment on its uncleanness since it is the "dirty place" where no-one wants to be responsible for.

In almost half of the cases the mother or the children are responsible for cleaning of the latrine. Nevertheless, the most common situation seems to be that this task does not correspond to any specific role in the family.

After defecation people use any kind of paper or leaves for cleaning. Although washing hands before meals and after work appears to be a routine, this habit is not extended to handwashing after defecation.

The custom is to have a vessel for water near the entrance of the house. Soap is not always available. Children are not taught handwashing after defecation since they do it openly in the garden or in the field.

c. Use of Human Excreta for Manure

North Vietnam characterizes for the use of human excreta for manure. In order to produce composted human excreta for fertilizing, which is safer than fresh excreta, the D.V.C.L. was invented and its use widely promoted.

The D.V.V.L. consists of two separated pits which are used alternately one for receiving fresh excreta and the other which is kept closed for composting. To assure good sanitary conditions, so as to prevent diseases, the D.V.C.L. must be airtight, dry, clean and over 3 months of composting is needed. The latrine requires of a coverslab and a separate container for urine. In the pit where excreta is composted the upper hole for defecation hole and the emptying door must be hermetically closed.

If used properly, the D.V.C.L. provides the community with excellent nutrients for the soil, richer than animal excreta */ with no risks for the people's health. If used without proper composting D.V.C.L. is a way of transmitting germs and virusis, dysentary, typhoid or earth helminthiasis.

*/	Nitrogen (%)	Phosphorus (%)	Kali (%)
Pig's Excreta	.45	.20	.60
Buffaloe's Excreta	.35-.45	.10-.25	.35-.50
Human's Excreta	1.99	1.12	1.27

Snell, Kubo and Sigiki, 1977. Study on Human Fertilizer

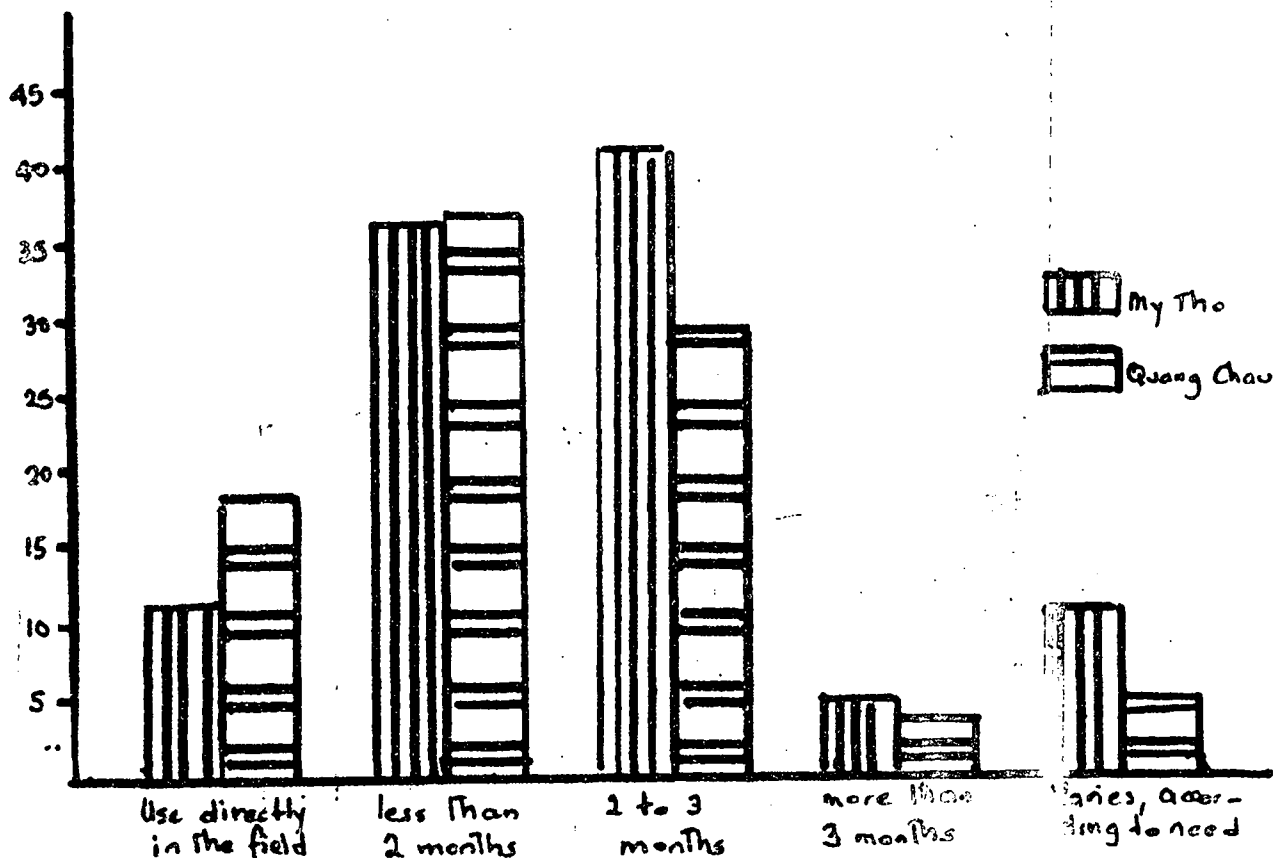
People in the three communes understand the danger of using fresh excreta for manure. Nevertheless, economic reasons lead them to use excreta as fertilizer before the composting process is completed. Since the family income depends mainly on the surplus production of rice over the quota and on vegetables produced in their gardens to increase or at least to maintain a high level of land productivity is essential for the rural workers, and in order to reach this goal they need a rather large amount of fertilizers almost all along the year. In fact, the working brigades receive only a small, insufficient amount of chemical fertilizers to be distributed among its members. Because of that, rural workers release mainly on human excreta for manure.

As seen in table No.10, only 5% of the cases, are composting excreta for more than three months, while the routine is to use it straight in the field or compost it for less than three months.

People compost excreta in the latrine or pills and combines it with animal's excreta and garbage. Men in the family are responsible to collect the excreta and transport it to the field; while the mother, with the help of the children, spreads it by hand.

TABLE No.10

Time used in Composting Excreta for Manure



3. Knowledge about excreta related diseases

Most of the people have a correct conception about the transmission of excreta related diseases and in diseases related to water contamination. As seen in table No. 11, around 95% of the women interviewed knew that bad environmental sanitation facilitate the transmission of dysentery, earth helminthiasis and diarrhoea.

TABLE No.11

Knowledge on Diseases Spread by Human Excreta

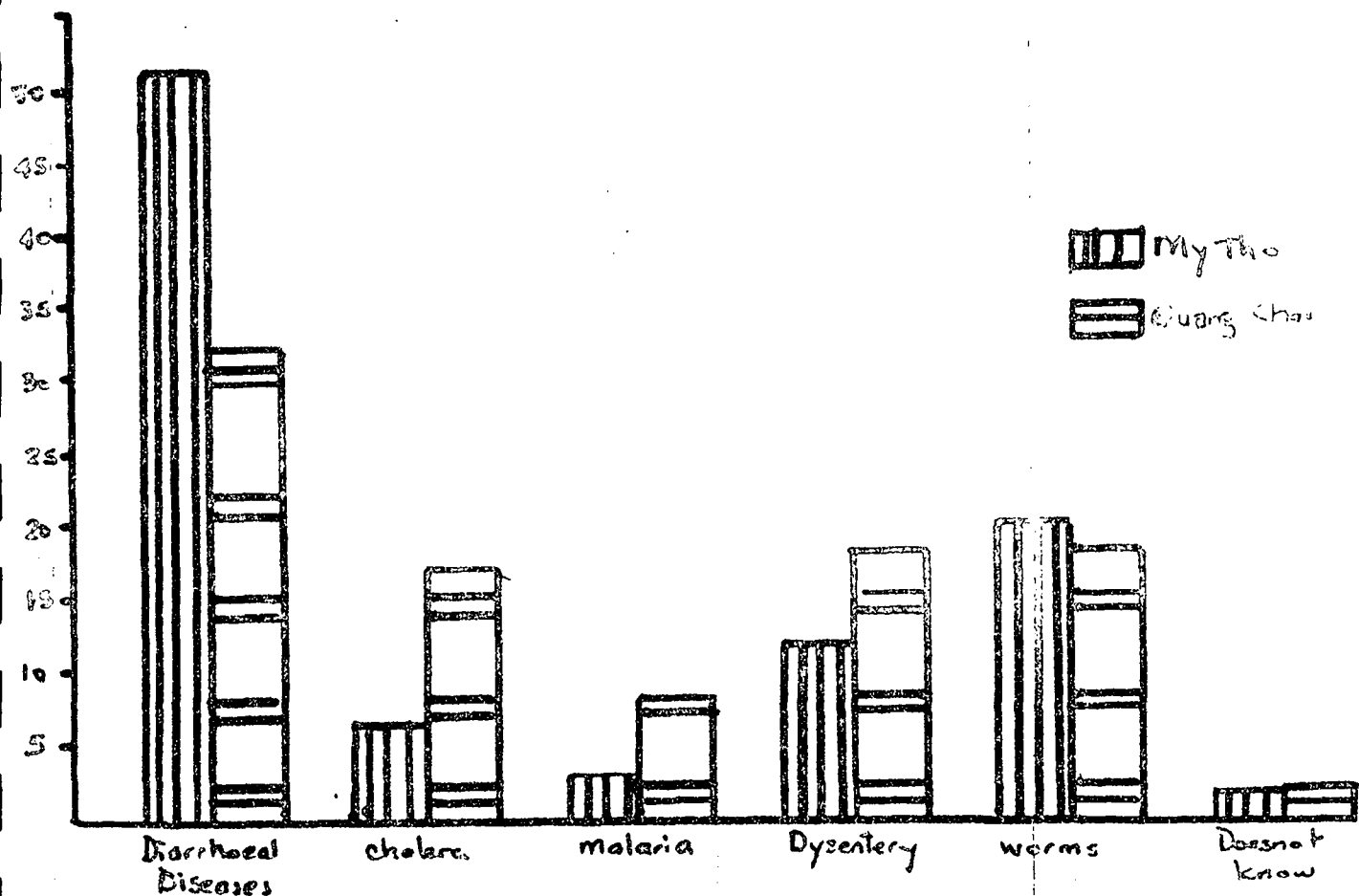
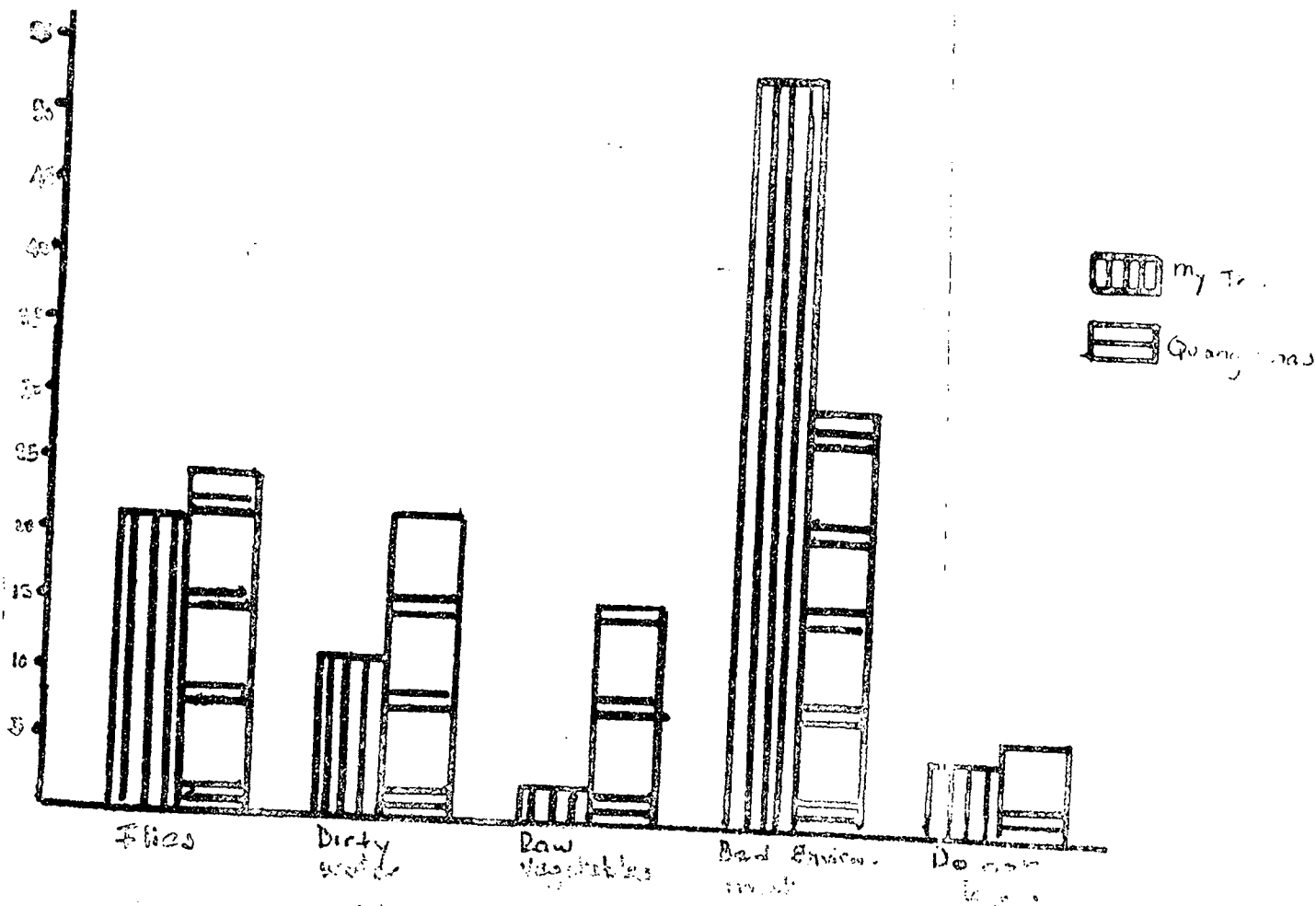


Table No.12 illustrates that people know the vectors of this diseases, and identify the bad environment as a main factor affecting the occurrence of excreta related diseases. For the adults it is clear that a proper use of the latrine is a preventive measure against bowel infections and helminthic infestations.

Table No. 12

Knowledge on Way of Diseases Transmission



VII. DOMESTIC USE OF WATER

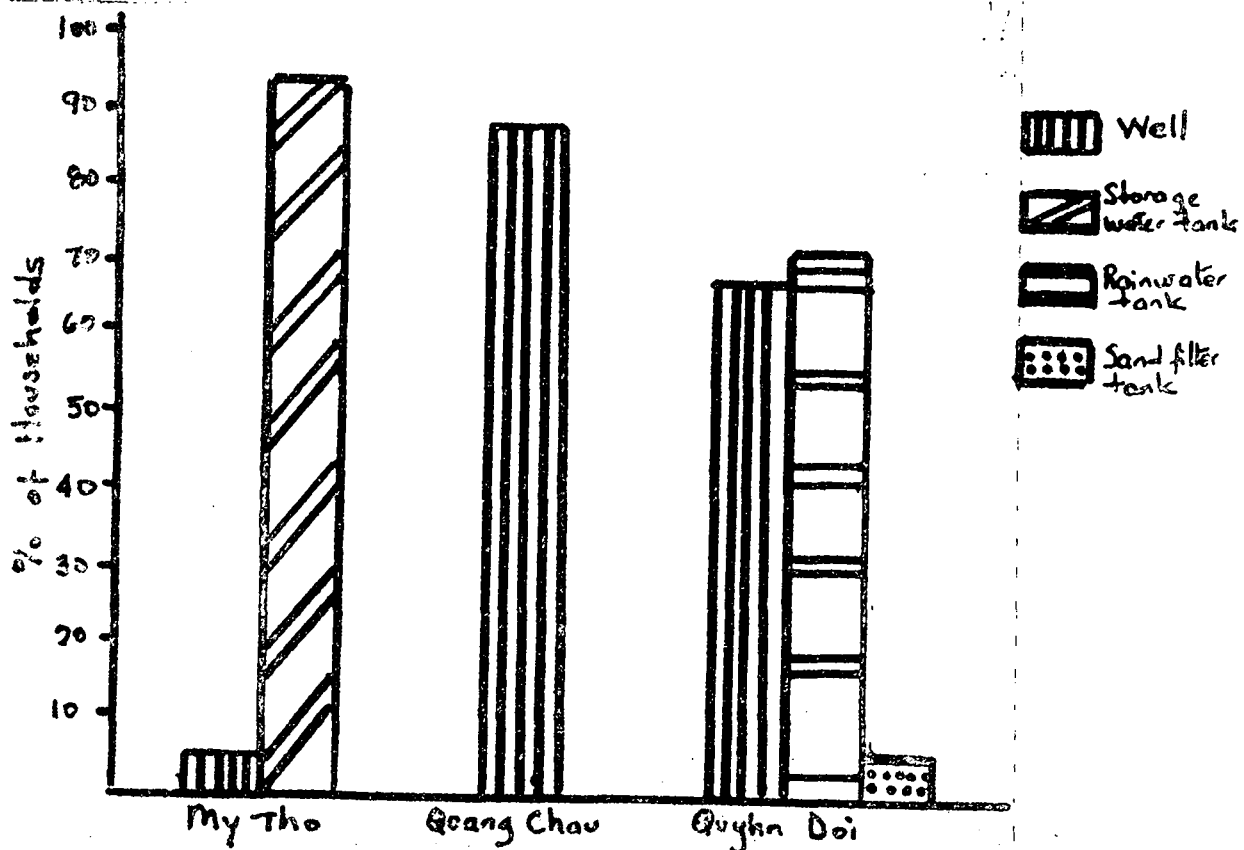
1. Source, Collection and Storage of Water

a. Kind of Water Supply

Twenty ponds and eleven public wells */ constitute the basic source of water for domestic use in My Tho. As illustrated in Table No. 13, less than 5% of the households have a private water supply, being a custom to draw the water and store it in tanks, made of earthenware.

TABLE No. 13

Kind of Water Sources For Domestic Use of Water



In 1984, UNICEF'S Water Programme drilled 14 protected wells for public use, 3 of them abandoned because of iron taste and chlorine contamination.

The ponds are located near the pathways. The ponds are surrounded by a circular wall made of bricks with a diameter of around 8 to 10 metres. The inner lining in most of the cases is damaged, with the protecting wall cracked in some places. Contamination problems are due to discharge of domestic sewage near the pond, proximity to the latrines and people and animals getting into the water.

The opposite situation was found in Quang Chau where 90% of the households have at their disposal a private water source. In 1986 there were 879 domestic shallow wells and 4 deep tube wells for public use.

This commune distinguishes for having a good water system, supplying enough quantity of water all along the year. The quality is adequate with no presence of iron or salt contamination. Because most of the wells lack of a cover, the risk of pollution exist due to natural materials, like leaves, dust or small animals or insects falling into the source.

The wells are builded with a permanent structure, inner lining to a depth of about 10 ft., a wall of about 3 ft. high, and an apron of 2.5 ft. wide. It was observed that in several cases inner lining was damaged and walls cracked.

Water source is located in front or aside the house. Buckets while not in use are kept near the well or in the upper side of the walls.

No regular cleaning or disinfection of wells was mentioned. Whenever cleaning is performed will take place once a year during dry season. For two days they will empty the well, swept the walls and add stone, marble or sand.

The hamlets of the commune of Quyhn Doi are surrounded by paddy fields, watered by a good irrigation system. Through a network of canals the people get water to serve the private vegetable gardens and the domestic needs. 631 households have private wells, and there are also 6 wells for public use.

For the use of domestic water almost 70% of the households of this commune rely on a private handdug well. As it is illustrated in Table No. 13 it is common the use of a rainwater catchment for drinking purposes. Around 70% of the households have at their disposal this facility. The rainwater tanks are made of cement with a capacity of 3 to 6 cubic metres enough in quantity for 3 to 4 months during dry season.

Around 5% of the households used a slow sand filter used for water from the canal that is poured into the tank and utilized for cooking and drinking purposes.

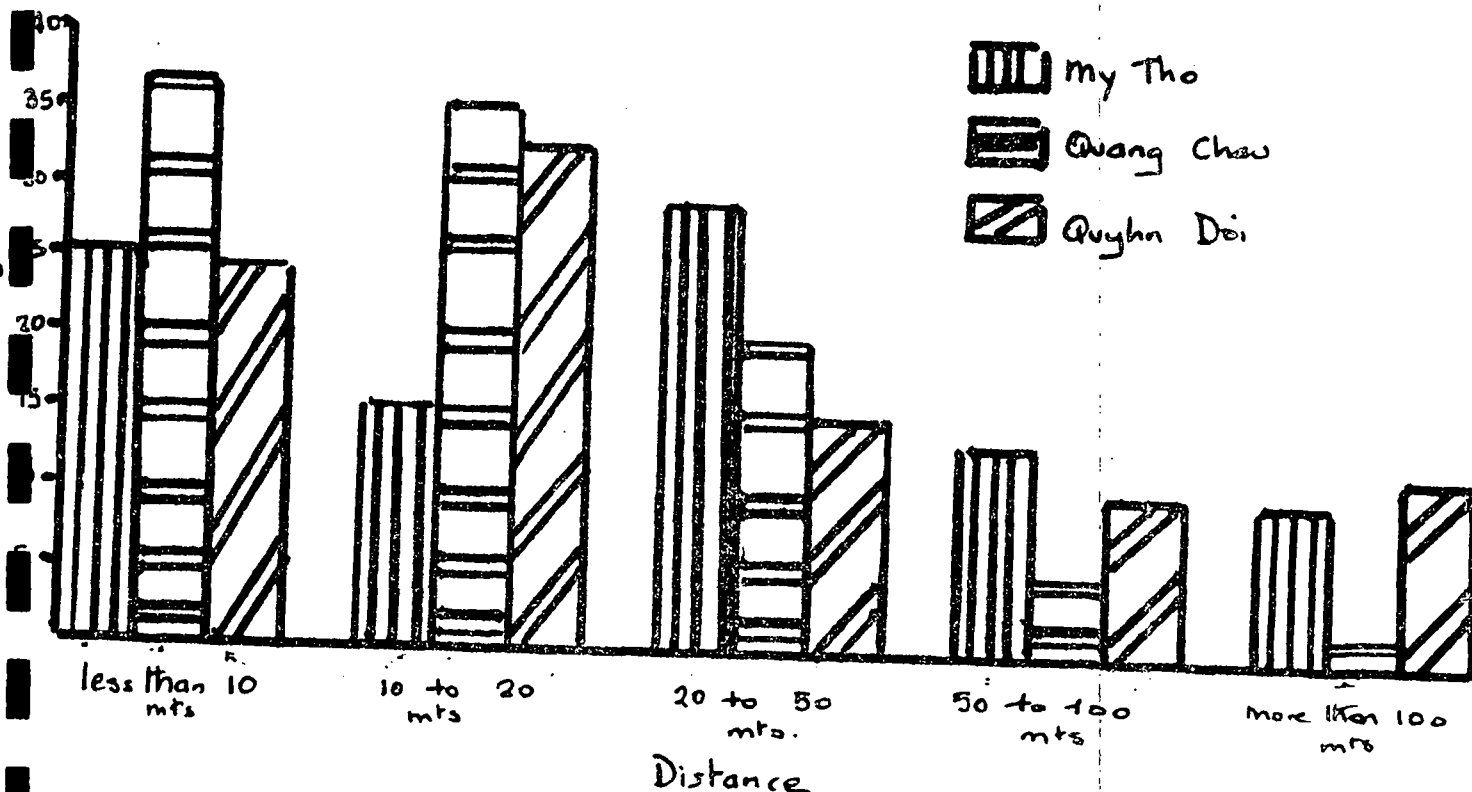
b. Distance

As seen in table No.14 in My Tho around half of the people need to walk less than 20 mts. to fetch water; while only for a fourth of them the water source is farther than 50 mts. from their houses.

In Quang Chau commune, since most of the households have a private water source for domestic use, distance to the well is only few metres. In fact, three fourths of the householders said to walk a distance shorter than 20 mts to fetch water, while 10%, a distance longer than 50 mts.

TABLE No. 14

Distance from Water Source to the House



Since two thirds of the families have a private water source in the commune of Quyhn Doi (66%), 57% have the device at a distance not longer than 20 mts. Long distances have to be walked only by people that do not own a well and have to draw water from the canal.

The time spend on drawing water depends on the distance to the source, the storage capacity at home, and the amount of water needed for the consumption of the family. Through the questionnaire women were asked how long they spend daily in drawing water. It was found that most of them were not able to give a precise answer.

The average consumption of water per family is of 8 buckets, (equivalent to 10 litres per bucket) basically used for cooking and drinking, since washing and body bathing are done in the pond or canal. When the family has a private source, and if people considere the water as of a good quality, as in Quang Chau, the well provides water for all purposes.

When a private source is near the house nobody at home has the role for drawing water and anyone can fetch water according to the needs.

In the north of Vietnam water is free of charge, even when a family uses its neighbor's private well as source.

c. Collection and Storage of Water

In My Tho and Quyhn Doi, women are responsible for water drawing, helped by children who become regular bearers. Two metallic buckets hanging from a bamboo stick is the common way of transporting water from the source to the house.

Buckets while not in use are kept directly on the ground, outside near the house. For this reason the bucket itself becomes a source of contamination.

Distance factor has an impact on storage and availability of water. The custom is to store water from the canal, ponds or public wells, in earthware pots and keep them outside, near the kitchen. Every 3 or 4 days they go to draw water into the tanks for home consumption.

They prefer to fetch water in the morning, when they believe the water is purer and cleaner, due to the first rays of sunlight.

In Quang Chau no storage of water is needed, since water is available all around the year from private sources located near the house.

2. Use of Water for Different Purposes

a. Drinking and Cooking

In My Tho most of the people depend for cooking and drinking on water coming from the ponds and public wells. The source remains the same all around the year.

In this commune there is not the custom of collecting rainwater for drinking purposes. In order to make the water more clear they add pieces of allum.

The taste of the water appeared to be determinant in choosing a source. Wells have been abandoned as a source of water for drinking and cooking because of the iron taste and they are only used for washing purposes.

In Quang Chau good quality water is available all around the year. The families use their own private source in dry and rainy season. The water level is lower in dry season but still enough for the needs of the family.

In Quyhn Doi, there is a different source of water according to the season. During rainy season rainwater is used for cooking and drinking. In dry season the rainwater stored in the catchment provides water for cooking and drinking 3 to 4 months. When this water is exhausted, they are forced to use water from the canal or pond.

The water from handdug wells is usually salty and for this reason washing and bathing is done with water from the well while water for cooking and drinking is fetched from the canal or provided by the rainwater tank.

In all the three communes there is the custom of drinking only boiled water, even when they are using rainwater.

b. Bathing and Personal Hygiene

In the communes under study, the people are not used to having a private bathroom. In My Tho people take a bath at the pond, in Quang Chau at home near the well, and in Quyhn Doi at the canal or near the well.

In hot season people take a daily bath, while in the cold season, when also the water is scarce, the custom is to do it weekly.

In My Tho, men usually go to the pond for a bath at noon and women at evening, after work, taking advantage to wash clothes and kitchen utencils. For women, the pond or the canal constitutes in a place for social contact.

Since soap is rather expensive */ and not always available, adults use hay or a piece of cloth to clean the body. Women enfold their trousers or even go dressed into the pond. Many children-mainly boys- take the bath naked. In only 27% of all cases studied, soap was available at home at the moment of the survey.

During the hot season any time of the day is good for the children to go into the pond. After a working journey buffaloes will be bathed by the children in the canal or in the lake.

c. Washing

Washing is done by the women in the pond or near the wells, after work. When soap is available it is used to wash only bright colored clothes, while dark ones are just rubbed and rinsed with water.**/

*/It was mentioned a price of 90 to 150 donges per bar of soap, equivalent to three kilos of good quality rice.

**/Further research must to be done to stablish the incidence of this custom in health problems like skin and gynecological diseases (Vaginitis and pelvic inflamation). Because of agricultural labour in the paddy fields these are the clothes that are continuously dirty and in direct contact with contaminated water. According to a study conducted by the National Institute of Obstetrics and Gynecology, 30% of the women in reproductive age suffer vaginitis.

When the household has a private well, washing is done near the well rubbing the clothes on a flat stone.

Because of the lack of a drainage system in the area used for washing, the waste water accumulates and gives origin to muddy spots which becomes a breeding place for mosquitoes. In fact, by three quarters of the domestic wells in the sample lack of a suitable drainage system.

3. Knowledge and practices regarding Water Transmitted diseases

In all the three communes under study, knowledge about water transmitted diseases seems to be widely spread.

Eventhough knowledge is spread, several physical conditions and social practices persist that facilitate the transmission of such a kind of diseases.

From a behavioral point of view, water transmitted diseases can be caught through three ways: (1) drinking contaminated water; (2) eating foods which have been prepared with or being in contact with contaminated water; and, (3) having the skin in contact with polluted water, what can be done directly-bathing or cleaning the body- or indirectly -using clothes which have been wet or washed with such a kind of water.

Awareness regarding the first of these ways is high and boiling the water that is going to be drank is a good widely spread custom. In fact, when thirsty, people are used to drinking tea, coffee or hot lemonade. In every house a vacuum flask is used for keeping hot water to prepare tea.

When going to the field the adults carry boiled water with green tea in a dried, hollow shell of a gourd or calabash used as a bowl.

Although drinking water is usually boiled, the custom is to remove the pot from the fire as soon as it starts seething. This practice raises the issue of for how long the water should be kept boiling in order to destroy any kind of germs and virusis. In this respect, WHO deems that the first ebullition is sufficient to provide safe water. Nevertheless, some experts recommend that in the case of Vietnam the water should be boiled at least for ten minutes. This is a matter that needs further analysis and discussion.

As far as water dealing with food is concerned, the situation is not as positive as the one described above for the drinking water. Usually contaminated water is used both for cleaning fresh vegetables that are eaten raw and for washing cups, pots, spoons, chopsticks, etc.

Finally, regarding the skin exposure to contaminated water, the custom of bathing and washing clothes in canals and ponds, common in the commune of My Tho, seems to facilitate the transmission of skin and eye infections through water.

VIII. SUMMARY

The basic purposes of the present study are to describe the prevailing conditions regarding domestic water supply and sanitation, as well as to explore the way in which the people think about and behave in connection with environmental sanitation and the domestic use of water.

This report is based on a survey applied to a random sample of 15% of the households of the communes of My Tho in Ha Nam Ninh province, Gaung Chau in Thanh Hoa, and Quynh Doi in Nghe Tinh province. All of them are pilot communes for the Sanitation Programme sponsored by UNICEF and implemented by the Ministry of Health.

The main instrument was a questionnaire containing 65 questions, most of them closed and precodified, applied to women head of the households. Complementary information was collected through a baseline survey at communal level and indepth interviews to the whole family.

The survey was conducted in the field by teams integrated by health workers, teachers and monitrices, members from the Women's Union, the Youth Union and the People's Committee at communal level.

As a strategy to implement the survey it was included as an activity of the training course in health education. The participants were trained as interviewers, people already involved in sanitation and water supply activities. All of them came from the communal level, similar in social and cultural background as the population under study.

Based mainly on data gathered through the survey, this report focus on the following subjects: (1) The characteristics of the pilot communes in terms of population size, economic activity, housing conditions and availability of education and health services. (2) Economic and social organization of the family. (3) Present conditions and social practices regarding environmental sanitation. In this respect particular attention is given to the conditions of latrines as well as practices with regard to defecation and use of human excreta for manure. (4) Present conditions and social practices regarding the domestic use of water. And, (5) knowledge and common practices in connection with excreta related diseases and water transmitted diseases.

The most outstanding findings in connection with sanitation are:

- Even though mothers know that children's stools are an important factor of environmental contamination they continue supporting open defecation during the socialization process. Practice that is sustained by the belief that children before seven years old are physically immature to use the latrine.

- There is not the custom of maintaining clean the latrine as it is the case with the house. The latrine is not considered an essential component of the house and there is social tolerance on its uncleanness, since it is the "dirty place" which no one wants to be responsible for.

- The Sanitation Programme has had a different impact in the three communes under study: The commune of Quyhn Doi is the most successful one: before the programme started, only 10% of the families owned a sanitary facility, of which hardly one third were in acceptable physical and hygienic conditions. By November 1986, after eighteen months under the programme almost all the households in the commune had a latrine in good conditions, and it was noticed how the maintenance of the new facility constituted a new social symbol of prestige.

- Regarding hygienic customs, although washing hands before meals and after work appears to be a routine, this habit is not extended to handwashing after defecation. Soap was found in only one third of the families, due to its high price and difficult availability.

- In the three communes human excreta is used for manure. In order to produce composted human excreta for fertilizing, which is safer than fresh excreta, the Double Vault Compost Latrine (D.V.C.L) has been widely adopted.

Nevertheless, although people understand the danger of using fresh excreta for manure, economic reasons lead them to use excreta as fertilizer before the composting process is completed (at least three months).

- Men in the family are responsible for collecting and carrying the excreta to the field, while the mother, with the help of the children, spread it by hand.

As for the domestic use of water is concerned, it was found that:

- Different kind of water sources prevail in the three communes: while twenty ponds and eleven public wells constitutes the basic source of water for domestic use in My Tho, in Quang Chau 90% of the families have at their disposal a private well, and in Quynh Doi, 70% of the families rely on a private well for washing and bathing, using rainwater catchments for drinking and cooking.

- Most of the wells were found to be unprotected with no cover, and no custom of periodical cleaning or disinfection is performed.

- Women are responsible for water drawing, helped by the children that become regular bearers. Two metallic buckets hanging from a bamboo stick is the common way of transporting water from the source to the house.

- Buckets while not in use are kept directly on the ground, outside near the house. For this reason the bucket itself can easily become a source of contamination.

- The custom is to store water from the canal, ponds or public wells in earthenware pots. The practice is to go to the source everytime their water storage has fallen below their required standard. Every 3 to 4 days they go to draw water into the tanks for home consumption.

- The taste of the water appeared to be the most important factor in deciding whether water can be used for drinking purposes or not. Even some water that is safe, is not used for drinking or cooking because of its iron taste

- Washing hands before meals was found to be a common practice, but no use of soap was observed.

- In the communes under study, the people are not used to having a private bathroom. In My Tho people are used to taking a bath at the pond; in Quang Chau at home near the well; and in Quynh Doi at the canal or near the well. Since soap is expensive and not always available, adults use hay or a piece of cloth to clean the body.

- Washing of clothes is done by the women in the pond/canal or near the wells, after work. When soap is available it is used to wash only bright colored clothes, while dark ones are just rubbed and rinsed with water.

- It is frequent to find that, because of a lack of a drainage system, the waste water accumulates and gives origin to muddy spots which becomes a breeding place for mosquitoes. In fact, by three fourths of the wells in the sample lack of a suitable drainage system.

Finally, the main findings regarding knowledge and practices in connection with excreta related diseases and water transmitted diseases are:

- Most of the people were able to identify excreta related diseases. Helminth infestation and diarrhoeal diseases was perceived to have been due to bad environmental sanitation.

- Knowledge about water transmitted diseases seems to be widely spread, nevertheless several physical conditions and social practices persist that facilitate the transmission of such diseases. It is common the good practice of boiling water, but a possible mean of diseases transmitted by water can be due to the water used to clean vegetables that are eaten raw and the water used to clean kitchen utensils.

- Regarding the skin exposure to contaminated water, the custom of bodybathing and washing clothes in canals and ponds, seems to facilitate the transmission of skin diseases and eye infections.

IX. RECOMMENDATIONS

The following recommendations, which are based on the results provided by the survey and by the experience gained in the field visits as well as by the implementation of the programme during the last two years, intend to contribute to the discussion about how to improve the Water Supply and Sanitation programme.

The most outstanding conclusion is the need for the integration of Water Supply and Sanitation programmes in such a way that planning, execution, monitoring and evaluation be implemented simultaneously and coordinately. Each programme can benefit from the experience of the other to improve the quality of their services and to significantly diminish costs in the future.

Eventhough UNICEF Sanitation Programme assigned equal amount of economic resources to the three pilot communes, the results of the programme were different. Searching for an explanation and since all three communes have similar economic and education levels, we found that the active role played by the local People's Committee, supported by the district and provincial authorities, seems to be the key factor for explaining the success of the programme in the commune of Quynh Doi in Nghe Tinh province.

Sanitation programme experience at pilot commune level has been positive and, at least in one case succesful; nevertheless, its high economic cost hampers its reproduction at a larger scale. Therefore, the present approach adopted by UNICEF using the district, instead of the commune, as programation unit seems to be the right one. Nevertheless, for this new approach to succeed, high priority should be given to the training and involvement of the communes People's Committee leaders in the implementation of the programme.

Following are some specific activities that can be developed by the two programmes :

1. The survey has proven to be useful tool to find out the profile of physical conditions, hygienic practices and customs of the people regarding environmental sanitation and domestic use of water.

Eventhough the survey in its present form provides with rich information, it seems advisable to shorten the questionnaire in order to diminish costs and facilitate its implementation. The questions regarding domestic use of water must be reviewed in order to provide us with better quality of information. UNICEF could elaborate a simplified version of the questionnaire including no more than 30 precodified questions, as well as collaborate in the training of health workers at district level who would be responsible in their turn for training the surveyors at communal level and for supervising the fieldwork. The surveyors should be recruited among healthworkers, teachers and monitrices.

The Water Supply and Sanitation Programme should also draft a manual for preparing, conducting, processing and analysing this kind of survey, including special sections with instructions for the interviewers and the supervisors.

2. A second important activity is education. For the last two years the sanitation programme has emphasized the importance of education and propaganda as key instruments to induce a radical change in some undesirable hygienic customs and defecation practices, as well as to motivate people to build their own latrines or to improve and maintain the existing ones. In fact, the Sanitation Programme during 1986 carried out Health Education training courses, but because of a lack of supervision, the personnel trained did not continue doing regularly their extension work at community level. A pamphlet was prepared for the Intestinal Parasite Control campaign that way only used in one of the six pilot communes.

To develop a complete education programme refering exclusively to the specific subjects of environmental sanitation and domestic use of water could be too expensive. Therefore, the idea of a wider education programme that includes nutrition, primary health care on the framework of Family Health seems to be the most suitable approach. A good example of this integrated approach is the programme that UNICEF jointly with UNFFA and the Ministry of Health have been developing in the framework of the Integrated Project. Nevertheless, while the integrated project is tested and implemented - what is going to take at least two or three years - specific educational materials dealing with environmental sanitation and domestic use of water should be developed and some specific education activities should be promoted.

The main objectives of these materials and activities must be (i) create awareness on the ways of transmission of the excreta and water related diseases; (ii) develop attitudes in the people against those customs and practices identified above in this report as undesirable; (iii) propose in a simple way alternative new patterns of behavior that are feasible and easy for the people to adopt, and, (iv) let them know which are the services of advice and assistance they can use at the brigade, commune and district level in this matters.

The main education agents at commune and district levels should be the health workers, teachers and monitrices. The approach is to involve actively the community using simple methods of communication. Home visits and informal talks supported by simple communication materials, like pamphlets and flipcharts, prepared by the Health Education Centre in the Ministry of Health are suggested.

The pamphlets should have a massive coverage in the community, while the flipcharts should be used as educational aid for the healthworkers and teachers. At the moment the Health Education Center at the Ministry of Health is preparing educational materials on Home Sanitation, School Sanitation and Personal Hygiene. It seems advisable to develop new pamphlets and flipcharts on the following subjects :

- Construction and maintainance of the Latrine
- Compostage Process
- Maintainance and cleaning of the well
- Excreta related diseases
- Water transmitted diseases

The education activities must be centered in mothers and children. The women are the primary users of water and sanitation; they are first decision makers in domestic matters and principal agents of socialization. The children are water drawers, in charge of siblings and main contaminators of the environment.

Schools can play an active constituing a nuclear point dissemination of information. With the help of the teachers, "Child to Child" activities can be conducted where children become responsible and perform specific tasks toward a better environmental sanitation and use of water. This new approach must be supported by changes in the curriculum that includes new elements on sanitation and personal hygiene.

Children can conduct their surveys, perform their own experiments and discover answers by themselves. They can map their school or commune and discover by themselves principal mosquito breeding spots and suggest ways on how to improve this places.

They can decide together with the teacher the activities to be developed at home (cleaning latrine, dispose garbage) at school (sweep classes, clean school latrine) with younger children or brothers (cut nails, control barefoot, train into the use of the latrine) with mothers (handwashing before meals, wash vegetables). To develop this activities children can organize campaigns and prepare their own posters, invent stories etc.

Mothers have to be included if we want to induce a change in defecation practices and in the domestic use of water. Health workers will start encouraging informal meetings to involve actively the women in the programme. Education must be centered in how to modify the behavior, and how to change values that are transmitted through the socialization process. That mothers become aware that open defecation in children is a mean of diseases transmission and that they as well can become sanitary controllers.

3. The premature use of excreta from the D.V.C.L. before the composting process is finished, is one of the main undesirable practices which should be eradicated. In order to start changing this behavior some kind of control system should be developed. This control system should include the use of a remainder blackboard put in a visible place in the latrine, where the date of closing the vault is registered, as well as the date after which composted will be ready to be used as safety fertilizer.

4. Soap is key for personal hygiene in general and for handwashing after defecation and before cooking or having meals in particular.

Since soap is expensive and not always available, it seems highly advisable to promote the local production of soap. A pilot experimental project to install a soap factory at district level should be promoted and supported. Since women play a crucial role in these matters, the factory could be runned by women and organized under the sponsorship of the Women's Union.

This soap factory project seems to be feasible, since soap making process is easy to learn and duplicate and require no longer than two days training. There is not a need for specialized or expensive equipment and all raw materials are available at local level.

Economic assistance can be given for six months, time enough to allow the women to improve the production in quantity and in quality. Traditional healers can help with information on scents or traditional medicines to be added to the soap.

Such a project may have several advantages : it would involve actively the community in an activity that deals indirectly with the health of the people; it would be a source of additional income for some women, and it would help the community to become self sufficient in the production of soap. In the future the same women in charge of the factory could become advisors and trainers to develop similar factories in other districts.

The integration of the Water Supply and Sanitation programme at UNICEF can be resumed as follows: (i) identification of common objectives; (ii) The implementation and analysis of a Knowledge, Attitudes, Practices and Needs in Water Supply and Sanitation; (iii) training of personnel at district level that will be in charge of implementing, monitoring and evaluating the Water Supply and Sanitation activities; (iv) Intestinal Parasite Control that includes stool examination and treatment for children between two and fifteen years old. (v) Physical improvements regarding Water Supply and Sanitation; (vi) Intestinal Parasite Programme that includes as well adults and, (vii) preparation of simple communication materials for continuous education at the commune level.

A N N E X No. 1

ENVIROMNMENTAL CLASSIFICATION OF EXCRETA RELATED
DISEASES

Table 4-1. Excreted Infections

<u>Biological Group and Organism</u>	<u>Disease a/</u>	<u>Reservoir b/</u>
VIRUSES		
Cocksackievirus	Various	Man
Echovirus	Various	Man
Hepatitis A virus	Infectious Hepatitis	Man
Poliovirus	Polioomyelitis	Man
Rotavirus	Gastroenteritis in children	?
BACTERIA		
<u>Campylobacter</u> spp.	Diarrhea in children	Animals and man
Pathogenic <u>Escherichia coli</u>	Gastroenteritis	Man
<u>Salmonella typhi</u>	Typhoid fever	Man
<u>S. paratyphi</u>	Paratyphoid fever	Man
Other salmonellae	Food poisoning	Man and animals
<u>Shigella</u> spp.	Bacillary dysentery	Man
<u>Vibrio cholerae</u>	Cholera	Man
Other vibrios	Diarrhea	Man
<u>Yersinia</u> spp.	Yersiniosis	Animals and man
PROTOZOA		
<u>Balantidium coli</u>	Mild diarrhea	Man and animals
<u>Entamoeba histolytica</u>	Amoebic dysentery and liver abscess	Man
<u>Giardia lamblia</u>	Diarrhea and malabsorption	Man
HELMINTHS		
<u>Ancylostoma duodenale</u>	Hookworm infection	Man-soil-man
<u>Ascaris lumbricoides</u>	Ascariasis	Man-soil-man
<u>Clonorchis sinensis</u>	Clonorchiasis	Animal or man-snail-fish-man
<u>Diphyllobothrium latum</u>	Diphyllobothriasis	Animal or man-copepod-fish-man
<u>Enterobius vermicularis</u>	Enterobiasis	Man-man
<u>Fasciola hepatica</u>	Fascioliasis	Sheep-snail-aquatic vegetation-man
<u>Fasciolopsis buski</u>	Fasciolopsiasis	Pig or man-snail-aquatic-vegetation-man
<u>Gastrodiscoides hominis</u>	Gastrodiscoidiasis	Pig-snail-aquatic-vegetation-man
<u>Heterophyes</u> spp.	Heterophyiasis	Dog or cat-snail-fish-man
<u>Hymenolepis</u> spp.	Hymenolepiasis	Man or rodent-man
<u>Metagonimus yokogawai</u>	Metagonimiasis	Dog or cat-snail-fish-man
<u>Necator americanus</u>	Hookworm infection	Man-soil-man
<u>Opisthorchis felineus</u>	Opisthorchiasis	Animal-snail-fish-man
<u>O. viverrini</u>	Opisthorchiasis	Animal-snail-fish-man
<u>Paragonimus westermani</u>	Paragonimiasis	Animal or man-snail-crayfish-man
<u>Schistosoma haematobium</u>	Schistosomiasis	Man-snail-man
<u>S. mansoni</u>	Schistosomiasis	Man-snail-man
<u>S. japonicum</u>	Schistosomiasis	Animal or man-snail-man
<u>Strongyloides stercoralis</u>	Strongyloidiasis	Man or dog (?) -man
<u>Taenia saginata</u>	Taeniasis	Man-cow-man
<u>T. solium</u>	Taeniasis	Man-pig-man or man-man
<u>Trichuris trichiura</u>	Trichuriasis	Man-soil-man

? Uncertain

a/ With all diseases listed, a symptomless human carrier state exists.

b/ For helminthis, the transmission process is given.

Source: Richard G. Feachem and others, Sanitation and Disease: Health Aspects of Excreta and Waste Water Management; World Bank Studies in Water Supply and Sanitation, No. 3 (Baltimore: Johns Hopkins University Press, forthcoming).

Table II-2: THEORETICAL POTENTIAL FOR CONTROL OF EXCRETA-RELATED INFECTION BY IMPROVEMENTS BY SANITATION AND PERSONAL HYGIENE

Disease category from Table II-1	Impact of sanitation alone	Impact of personal hygiene alone
I	negligible	great
II	slight to moderate	moderate
III	great	negligible
IV	great	negligible
V	moderate	negligible
VI	slight to moderate	negligible

Source: Feachem et al. Appropriate Technology for Water Supply and Sanitation, volume 3: Health Aspects of Excreta and Sullage Management--A State-of-the-Art Review. Washington, D.C., World Bank, 1980.

TABLE II: ENVIRONMENTAL CLASSIFICATION OF EXCRETA-RELATED INFECTIONS

CATEGORY	FEATURES*	INFECTIONS	DOMINANT TRANSMISSION FOCI	MAJOR CONTROL STRATEGIES
I	Non-latent, low infectious dose (< 100 organisms)	Enterobiasis Enteric virus infections Hymenolepiasis Amoebiasis Giardiasis Balantidiasis	Personal contamination domestic contamination	Domestic water supply Sanitary education Improved housing Provision of <i>toilets</i>
II	Non-latent medium or high infectious dose (> 10 000 organisms), moderately persistent and able to multiply	Typhoid Salmonellosis Shigellosis Cholera Path. <i>E. coli</i> entericis Yersiniosis <u>Campylobacter enteritis</u>	Personal contamination Domestic contamination Water contamination Crop contamination	Domestic water supply Sanitary education Improved housing Provision of <i>toilets</i> Treatment prior to discharge or reuse
III	Latent and persistent with no intermediate host; unable to multiply	Ascariasis Trichuriasis Hookworm infection Strongyloidiasis	Yard contamination Field contamination Crop contamination	Provision of <i>toilets</i> Treatment prior to land application
IV	Latent and persistent with cow or pig intermediate host; unable to multiply	Taeniasis	Yard contamination Field contamination Fodder contamination	Provision of <i>toilets</i> Treatment prior to land application Cooking of meat Meat inspection
V	Latent and persistent with aquatic intermediate host(s); able to multiply (except <u>Diphyllobothrium</u>)	Clonorchiasis Diphyllobothriasis Fascioliasis Fasciolopsiasis Gastroduoscoidiasis Heterophyiasis Metagonimiasis Paragonimiasis Schistosomiasis	Water contamination	Provision of <i>toilets</i> Treatment prior to discharge Control of animal reservoirs Control of intermediate hosts Cooking of fish and aquatic vegetables
VI	Excreta-related insect vectors	Bancroftian filariasis (transmitted by <i>Culex pipiens</i>), and all the infections listed in Categories I-III which may be transmitted by flies and cockroaches	Insects breed in various fecally contaminated sites	Identification and elimination of suitable breeding sites

Source: Feachem et al. (in press)

* Latency: a latent organism requires some time in the extra-intestinal environment before it becomes infective to man. Persistency refers to the ability of an organism to survive in the extra-intestinal environment.

A N N E X No.2

WATER SUPPLY AND SANITATION HOUSEHOLD SURVEY

SOCIALIST REPUBLIC OF VIETNAM
MINISTRY OF HEALTH

COMMUNE BASE-LINE DATA

(With particular reference to the Integrated
Environmental Sanitation Programme)

In cooperation with
UNICEF
INTEGRATED ENVIRONMENTAL SANITATION PROGRAMME
1986

COMMUNE SANITATION AND
HEALTH STATISTICS SURVEY

A. LOCATIONAL ASPECTS

1. Indicate location of the commune on a
 - District map (scale 1 :)Indicate location of the district on a
 - Provincial map. (scale 1 :)
2. Distance to the nearest district hospital :
 - by road : km
 - by boat : km
3. Distance to the provincial capital :
 - by road : km
 - by boat : km
4. Indicate on a map of the commune (scale 1 :)
 - residential houses (if possible with house numbers)
 - health station
 - primary school (s)
 - nursery (es)
 - Creche (s)
 - market (s)
 - people's committee office
 - agricultural areas (indicate type of crops and total hectares under cultivation)
 - indicate working brigades
 - industry (es)
 - cinema
 - sport field (s)
 - roads
5. Indicate on a separate map of the commune (scale 1 :)
 - areas subject to flooding
 - streams, rivers or canals (irrigation/drainage)
 - pumping stations.
 - water sources : - drilled wells handpump YES/NO
 - shallow wells covered : YES/NO
 - ponds
 - rainwater tanks
 - piped water supply system
6. Indicate on a separate map of the commune (scale 1 :)
 - soil conditions
 - ground water table : in dry season
in wet season

b. Climatological Aspects

1. Average rainfall per month : (mm/day)

Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct	Nov.	De.

2. Average daily temperature per month (°C/day)

Jan	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec

3. Please comment on the seasonal variations of the wind :

0 = no wind 1 = little wind 2 = hard winds 3 = typhoon(s)

Jan	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.

c. Population :

- number of households :
- Number of births registered during last 12 months :
- average annual birth rate :
- Composition of population by age and sex

	F	M
0 - 1 year		
1 - 5 years		
5 - 10		
10 - 15		
15 - 20		
20 - 25		
25 - 30		
30 - 35		
35 - 40		
40 - 45		
45 - 50		
50 - 55		
55 - 60		
60 and more		

D. Education :

1. Total number of creches :
- Total number of children in creches :

Name of creche :				
Number of monotrices :				
Number of children :				

2. Total number of nursery schools :
- Total number of children in nursery schools :

Name of nursery :				
Number of teachers :				
Number of children :				

3. Total number of primary schools :
- Total number of children in primary schools :

Name of primary school :				
Number of teachers :				
Number of children :				
Number of shifts per day :				

4. Total number of children attending secondary school :
- Location of secondary school :
- Distance of secondary school from commune :

5. Please list any other informal educational activities in the commune :

.....

6. Number of health cadre training centres :
- Total number of trainees :
- Total number of trainers :

7. Number of monitrice training centers :
- Total number of trainees :
- Total number of trainers :

E. Economic Activity

1. Agriculture

- Total hectares in rice :
- Average yield hectare/per year :
- Average need for fertilizer per kg./hectare/year :
- Please indicate planting and harvesting season and demand for fertilizer :

	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct	Nov.	De
Planting												
Harvesting												
Fertilizing												

* Please indicate availability of fertilizer in commune :

- Chemical fertilizer Yes/No kg per year :
- Animal manure Yes/No kg per year :
- Composted human excreta Yes/No kg per year :

- Total hectares in other crops (please specify) :

Name of crop :				
Total hectares :				
Average yield/yr :				
Average need fertilizer :				

- Home gardens

Total hectares used for home gardens :

Please indicate planting (seeding) and harvesting season and demand for fertilizing each crop :

(indicate : 0 = planting/seeding + = fertilizing x = harvesting)

Name of crop :	Jan.	Febr.	March	April	May	June	July
Jan.							
Febr.							
March							
April							
May							
June							
July							

Aug.					
Sept.					
Oct.					
Nov.					
Dec.					

- Fish

Total hectares of fish ponds :

Average production per hc/yr :

- fish :

- shimps :

Total No. of pigs in commune :

Total No. of buffalo*s in commune :

Working brigades

No. of working brigades :

Mortality

Total number of registered deaths by age groups and sex in last year (1985)

	F	M
28 weeks pregnancy - 7 months		
Born alive		
born dead		
Live birth to 7 days		
Live birth to 28 days		
under 1 year		
1 - 5 years		
5 - 10 years		
10 - 15 years		
15 - 30 years		
30 - 45 years		
45 and more years		

Total number of deaths caused by diarrhoeal diseases by age groups specified

by months in 1985.

	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	I
10 - 28 days												
28 days - 1 year												
1 - 2 years												
2 - 3 years												
3 - 4 years												
4 - 5 years												

G. Morbidity

- Total number of cases consulted for diarrhoeal diseases per sex and age group

Diarrhoeal Diseases and use of ORS

Age	F	M	Total packages of ORS
0 - 28 days			
28 days - 1 year			
1 - 2 years			
2 - 3 years			
3 - 4 years			
4 - 5 years			

Skin Infection

Age	F	M
0 - 28 days		
28 days - 1 year		
1 - 2		
2 - 3		
3 - 4		
4 - 5		

Eye Infection

0 - 28 days		
28 days - 1 year		
1 - 2 years		
2 - 3		
3 - 4		
4 - 5		

Number of cases of diarrhoeal diseases in population between 0 - 5 years, specified by month of the year :

	<u>Number of Consultations</u>					
	0 - 28 days	28 - 1 year	1 - 2	2 - 3	3- 4	4 - 5
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Number of parasite infections specified by age in last year :

	<u>less than 1 year</u>	<u>1 - 5</u>	<u>5 - 10</u>	<u>10 - 15</u>	<u>15 and more</u>
Ascaris					
Hookworm					
Trichuris					
Pinworm					
Others					

H. Health System :

- Total number of personnel in Health Station
- Kind of specialization and training
- Total number of sanitation workers
- Total number of midwives
- Total number of health workers in brigades
- Total number of beds

Laboratory Facilities :

Microscopes Number

Glasses

Incubator

Centrifuge

.....

.....

;.....

I. Sanitation and Water Supply

1. Total number of household latrines :

	Household latrines	Good condition	Bad condition
D.V.C.L			
Pit latrine			
Fish pond			
Septic tank			

2. Total number of public latrines :

	<u>Health Station</u>		<u>Schools</u>		<u>Cadres</u>		<u>Markets</u>		<u>Others</u>	
	Good	bad condition	Good	bad	good	bad	good	bad	good	bad
D.V.C.L										
Pit latrine										
Septic tank										
Fish pond										

3. Sources of Water Supply

BathroomsTotal number of bathrooms

<u>Household</u>	
<u>School</u>	
<u>Health station</u>	
<u>Creche</u>	
<u>Others</u>	

J. Community Organization

1. Kind of civil organization and activities :

Red cross

Women's union

Red Pioneers

2. Participation in CDD programme :

- Total number of packages of ORS distributed per year :

1982 :

1983 :

1984 :

1985 :

3. Participation in EPI programme :

- Total number of vaccines used per year

<u>Number</u>	<u>Sabine (OPV)</u>	<u>Measles</u>	<u>Diphtheria</u>	<u>Tetanus</u>	<u>Pertussis</u>	<u>BCG</u>
Participation in PAM programme :						

- Total population covered by the programme :

<u>Pregnant mothers</u>	
<u>Mothers breast feeding</u>	
<u>Children in creches</u>	
<u>Children undenovished</u>	

5. Participation in UNICEF's water supply programme :

	in use	maintained
Total wells drilled		

6. Participation in other programme :

SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF HEALTH

COMMUNE HOUSEHOLD SURVEY

(With particular reference to needs,
knowledge, attitude and practice of
domestic hygiene, Water Supply and
Sanitation)

PART I : QUESTIONNAIRE

(Preferably be executed by female interviewer)

in cooperation with

UNICEF

INTEGRATED ENVIRONMENTAL SANITATION PROGRAMME

1986.

SANITATION HOUSEHOLD SURVEY

01. Province : *

Survey No :

District :

Commune :

02. Household No :

Name of the owner :

Name of the interviewed :

Date :

Name of interviewer :

Name of supervisor :

Time :

*

Ha Nam Ninh	1
Nghe Tinh	2
Thanh Hoa	3
Long An	4
Minh Hai	5
Kien Giang	6

I. ATTITUDES AND BEHAVIOR

Family Data :

03. How many persons are living with you?

Please give all the names of persons who usually live in this household. Let u start with the head of the household. What is this persons name? (see page 2)

09. For each of children sick last two weeks collect information?

What was _____ problem?

(name of child)

1. Eye infection
2. Diarrhoea
3. Worms
4. Dysentery
5. Skin infection
- 9 Others specify _____

What was _____ problem?

1. Eye infection
2. Diarrhoea
3. Worms
4. Dysentery
5. Skin infection
6. Others Specify -----

What was _____ problem?

1. Eye infection
2. Diarrhoea
3. Worms
4. Dysentery
5. Skin infection
- 9 Others . Specify _____

10. Last time when your child had diarrhoea where did you go?

Name	What is the relationship of this person to the (*) head of household	How old is this person	05. How many school years has this person completed	07. what is this person main activity	08. INFORMATION ONLY FOR CHILDREN 0 - 5 YEARS When she/he sick last 2 weeks

* index :

- 1. Head
- 2. Spouse
- 3. Married child
- @. Spouse of married child
- 5 Unmarried child
- 6. Father/mother/father in law/mother in law
- 7. Brother/sister/brother in law/sister in law

1. Home treatment
2. Hospital of district or provincial level.
3. Commune health center
4. Health station
5. Hygiene station
9. Others . Specify _____

11. During what time of the year do they get diarrhoeas mostly?

1. Dry season
2. Rainy season
9. Others specify _____

12. How do you treat diarrhoeas?

1. Oresol (ORS)
2. Home solution
3. Drugs. Amlibiotics
4. Suspend food and liquids.
9. Others. specify _____

13. From whom did you learn to treat diarrhoeas?

1. Nurse or doctor at the health central.
2. Health worker of the brigades.
3. Midwives
4. Mother
5. Neighbor or fiend.
9. Others . specify _____

14. Why do children get diarrhoeas?

0. Don't know
1. Bad water
2. Bad wea ther
3. Bad food
4. Dirty environment
9. Others. specify _____

15. What do you do to prevent diarrhoeas in your children?

1. Boil water
2. Food well cooked
3. Better food hygiene
4. Hand washing before meals
5. Hand washing after use of latrine
6. Maintain more cleanliness in house
7. Keep latrine clean
8. Avoid use of fresh excreta as fertilizer
9. Others. Specify _____

DRINKING WATER

16. From where do you obtain water for :

TYPE OF SOURCE	DRY SEASON		WET SEASON	
	TYPE OF USE	REASON	TYPE OF USE	REASON
	Drinking Cooking Clothes washing Utensils Bathing Cattle Other	Distance Taste Private Few other users Abundant Health Other	Drinking Cooking Clothes washing Utensils Bathing Cattle Other	Distance Taste Private Few other users Abundant Health Other
Drilled well Unprotected well Shallow Protected well Shallow Pond Rain water tank Vendor etc.				

17. For how many months is there plenty of water?

Please specify :

	Enough	Scarce
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

18. When you have to buy drinking water, What is the cost of one litre of water? _____

19. From where do you buy your water?

- friend
- street vendor
- boat vendor
- others.

20. How much water do you use per day for :

Drinking _____
 Cooking _____
 Washing dishes _____
 Bathing _____

21. How much time do you spend daily to obtain water?

_____ hours

22. Do you have to wait at the well, pump?

1. YES _____
2. NO _____ (continue of 24)

23. How long do you wait?

_____ minutes

24. How far is the water source from your house?

1. 0 - 20 mts

6.

2. 20 - 50 mts
 3. 50 - 100 mts
 4. 100 - 150 mts
 5. 150 - 200 mts
 6. 200 and more
 9. Do not know
25. Do you boil drinking water?
0. No
 1. Yes (continue of 26)
26. If no, why don't you boil the water?
1. No time
 2. No need, it is safe
 3. No
 4. No custom
 9. Others. specify _____
27. Can unclean water cause sickness?
0. No (continue)
 1. Yes
28. If Yes, what sickness?
1. Eye infection
 2. Diarrhoeal diseases
 3. Worms
 4. Dysentery
 5. Skin infection
 9. Others specify _____

SANITARY FACILITIES AND PERSONAL HYGIENE

29. Do you have a private latrine?
0. No
 1. Yes
30. How many people use the latrine? _____
31. If no latrine, where does your family defecate?
1. neighborslatrine

7.

- 2. Field
- 3. Garden
- 4. Communal latrine
- 9. Others. Specify _____

32. What material do you use to clean your hands after using the latrine?

- 1. Water
- 2. Toilette paper
- 3. other paper
- 4. leaves
- 9. Others. Specify _____

33. From where do you get this paper?

- 1. Store
- 2. Newspaper
- 9. Others specify _____

PERSONAL HYGIENE

34. When do you wash your hands?

	You	Your husband	Your children
1. Before eating			
2. Before cooking			
3. After eating			
4. After using latrine			
5. After work			
9. Others .			

35. How do you wash your hands?
1. With water only
 2. With ashes and water
 3. With soap and water
 4. With plants
 9. Others. Specify _____

36. Today before having breakfast (lunch or dinner) did the children wash their hands?
0. No
 1. Yes
 9. Do not know
37. Do you think diseases can be spread by human excreta?
0. No (continue of 10)
 1. Yes
38. If yes, what diseases can be spread by human excreta?
1. Diarrhoeal diseases
 2. Cholera
 3. Malaria
 4. Dysentery
 5. Parasites or worms
 9. Others. Specify _____

39. How are these diseases spread?
1. Flies
 2. Dirty water
 3. Dirty hands/nails
 4. Raw vegetables
 9. Others. Specify _____

40. At what age do children start using latrine? years.
41. Do you think children stools are inofersive for health?
0. No
 1. Yes
42. Before children start using the latrine where do they defecate?

1. Pot
2. Garden (hole)
3. Any place
4. inside house and then throw away
9. Others. Specify _____

43. Are there any problems for the younger children to use the latrine?

1. Dislike smell
2. Fear hole
3. Fear darkness
4. Too far from house
9. Others. Specify _____

44. Who is in charge of training the children to go to the latrine?

0. Nobody
1. Mother/mother in law
3. Sister/brother
9. Others. Specify _____

45. How often do you clean the latrine?

0. Never
1. Daily
2. Weekly
3. When ever it is dirty
9. Others, Specify _____

46. Who is in charge of cleaning the latrine?

0. Nobody
1. Mother
2. Children
3. Mother/mother in law
9. Others. Specify _____

WASHING

47. Do you have a bathroom?
0. No
 1. Yes
48. Do you use soap for body washing?
0. No
 1. Yes
49. How much do you pay for one piece of soap? _____ dongs
50. Where do you buy it?

HUMAN EXCRETA DISPOSAL

51. Do you use human excreta for manure?
0. No
 1. Yes
52. Do you think fresh excreta is better fertilizer than compost excreta?
0. No
 1. Yes
53. For how long do you compost human excreta?
0. Do not compost use directly
 1. Less than 2 months
 2. More than 3 months
 3. 3 months
54. Where do you compost human excreta?
1. Piling
 2. D.V.C.L
 3. Dighole
 9. Others. Specify

FOR D.V.C.L

55. How long does it take to fill one vault with excreta and ashes?
1. Less than 2 months
 2. 2 - 4 months
 3. More than 4 months
56. Who brings the compost excreta to the field?

1. Women
2. Children
3. Man

57. Where do you use the collected urine?

1. rice field
2. vegetable garden

ANIMAL EXCRETA AND REFUSE DISPOSAL

58. Do you have animals at home? (note number of animals)

0. No animals (continue of 41)
1. Pigs
2. Chicken
3. Ducks
4. Cows
5. Buffalo
9. Others. Specify _____

59. How do you dispose animals excreta?

1. Tank
2. Piling
3. Hole in garden
4. Combine with human excreta
5. Use directly in crops
9. Others. Specify _____

FISH POND LATRINE

60. What kind of fish is raised in the pond?

61. What is the average yield of fish?

62. Do you use fish ponds to dispose human excreta when flooding?

- 0. No
 - 1. Yes
63. Do you sometimes eat raw fish?
- 0. No
 - 1. Yes
64. Are aquatic weeds or vegetables grown in the pond?
- 0. No
 - 1. Yes
65. How often is the pond drained?

PIT LATRINE

66. How often do you empty the latrine?
67. What method do you use to empty the latrine?
68. Is the present pit a replacement for another filled on plot?
- 0. No
 - 1. Yes
69. Does the level of pit rises during rains?
- 0. No
 - 1. Yes
70. If the latrine floods or collapses where do you and your family defecate?
- 1. in flooded latrine
 - 2. neighbors latrine
 - 3. communal latrine
 - 4. Garden/field
 - 9. Others/specify _____

71. When there is a flood do faeces come out?
- 0. No
 - 1. Yes

Part II OBSERVATIONS

Survey :-----

Date :

Time :

Observer :

City :

District :

Community :

Household number :

3.

6. Is there a private vessel for drinking water in the house?

YES

NO

- covered or
uncovered?

7. Can hands touch the water during drawing?

YES

NO

8. Are water and soap present for handwashing?

YES

NO

BATHROOM

9. Building materials : CONDITION

1. wood

2. bricks

3. mud

4. stones

5. cement

6. corrugated iron

9. others specify _____

10. Is there waste water drainage?

YES

NO

11. Where does the waste water go?

garden

field

drain

street

other (specify)

12. How far is the bathroom from house?.....mts.

13. How far is the bathroom from latrine?.....mts.

14. Where is the garbage and rubbish disposed?

1. hole in the garden
2. field
3. canal
4. latrine
9. others specify

15. If there is dirty water near the house, where does it come from?

0. no dirty water
1. neighbors house
2. latrine
3. bathroom
9. others specify

16. Do they have plants that are watered with drainage water?

YES

NO

WATER SUPPLY

WELL

17. Depth _____ mts

18. wall/ling

floor

drainage

cover

19. Contaminated

0. No

1. iron

2. salt

3. turbidity

20. How far is well from latrine _____ mts

21. How far is well from house _____ mts

22. Where are buckets located while not use ?

1. inside well

2. on the floor

9. others specify _____

RAIN WATER TANK

23. Estimate volume of tank :

1. is there a tap on the tank?

LATRINE INFORMATION

24. Kind of latrine :

1. D.V.C.L
2. Fish pond
3. Pit latrine
9. others specify _____

25. How far from house _____ mts

26. How far from water supply _____ mts

27. Are the washing facilities in or near the latrine?

- soap
- water
- ashes

LATRINE INFORMATION

- | | |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 28. Cleanliness
of slud | <ol style="list-style-type: none"> 1. clean 2. dirty 3. very dirty |
| 29. Dryness of contents | <ol style="list-style-type: none"> 1. dry 2. muddy 3. wet |
| 30. Smell | <ol style="list-style-type: none"> 0. none 1. slight 2. bad 3. terrible |
| 31. Flies | <ol style="list-style-type: none"> 0. none 1. few 3. many |
| 32. Walls | <ol style="list-style-type: none"> 1. soil/lime 2. mud 3. corrugated iron 4. burned bricks |

6.

- 5. wood
- 6. bamboo
- 7. cement
- 9. others specify _____

33. Roof

- 1. YES
- 0. NO

34. Door

- 1. YES
- 0. NO

35. Slab

- 1. concrete
- 2. mud
- 3. wood
- 4. metal
- 9. others specify _____

36. Observations of the presence of :

- Container filled with ashes
 - 0. NO
 - 1. YES
- Tin of cup to scoop ashes
 - 0. No
 - 1. Yes
- Urine container
 - 0. No
 - 1. Yes
- two access doors in place
 - 0. No
 - 1. Yes
- two access doors fly proof sealed
 - 0. No
 - 1. Yes
- one vault in use
 - 0. No
 - 1. Yes
- openings or craks in vaults walls
 - 0. No
 - 1. Yes
- defecation hole closely covered
 - 0. No
 - 1. Yes

FISH POND LATRINE (HCMC)

37. Smell
0. none
1. slight
2. bad
38. Flies
0. none
1. few
2. many
39. latrine structure made of
1. mud
2. corrugated iron
3. burned bricks
4. wood
5. bamboo
6. cement
9. others specify _____

40. Roof
0. No
1. Yes
41. Door
0. No
1. Yes
42. Is toilet paper or other materials present in the latrine?
0. No
1. Yes
43. Are there dikes around the pond to protect against floods?
0. No
1. Yes
44. Is the pond connected with a canal or river?
0. No
1. Yes

PIT LATRINE

45. lining/collapse
1. no lining/no collapse
2. no lining/collapse
3. lining/no collapse
4. lining/collapse