RESEARCH REPORT

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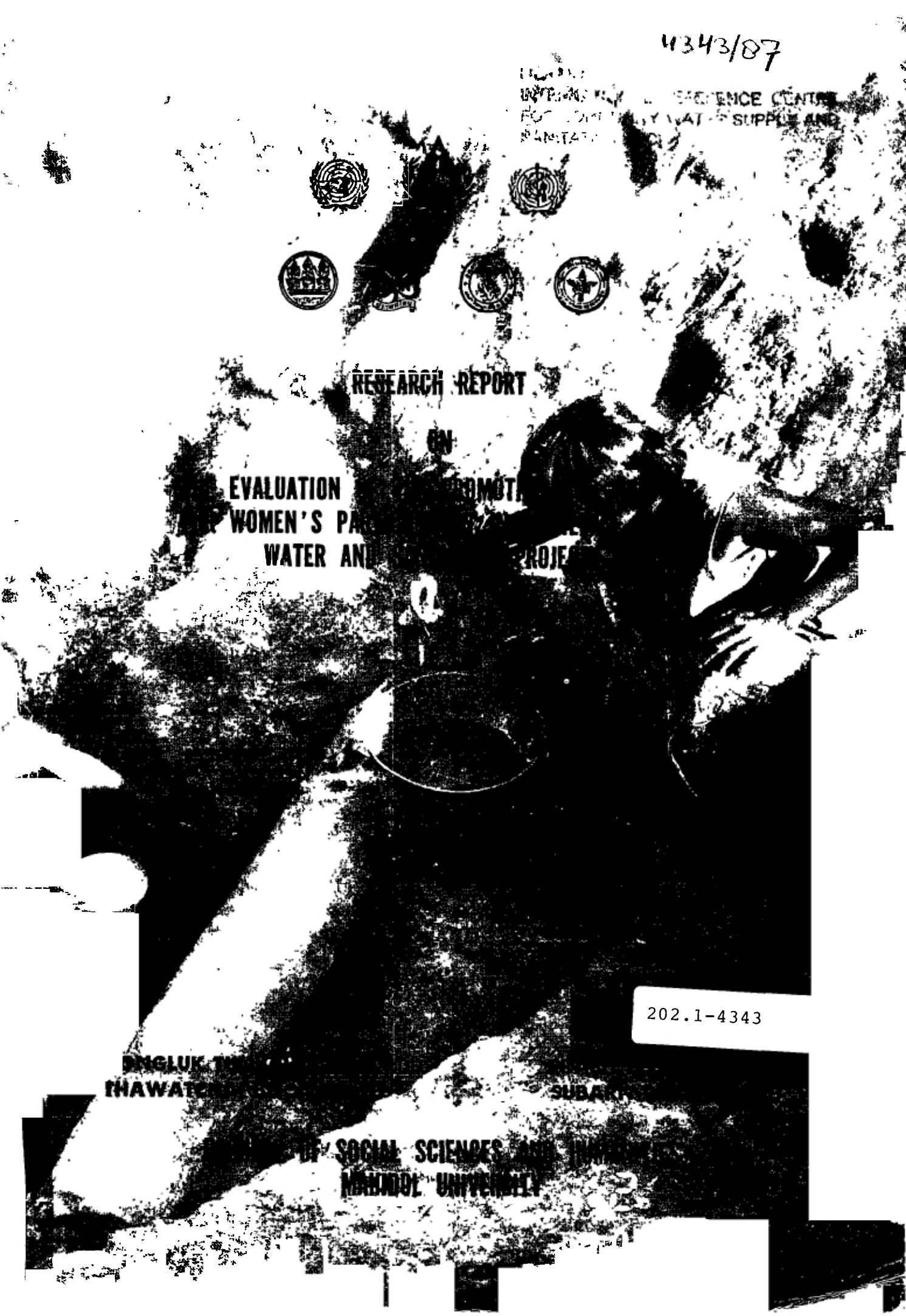

DINGLUK TW...
INAWAT... ...SUBAK...

...OF SOCIAL SCIENCES AND ...
MANIPUR UNIVERSITY

Research Report

on

The Evaluation of the Promotion and Support for Women's Participation in a Village Based Water and Sanitation Project

By

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Chapter 1

Introduction

Background

Sources of clean water and sanitation have always been problems in rural Thailand, especially in the Northeast. The Thai Government is aware of these problems and has been working to ease them for decades. One goal of the sixth National Economic and Social Development Plan, (1987-1991) which overlaps the International Drinking Water Supply and Sanitation Decade (1981-1990), is for 95 percent of the rural population to have clean drinking water supplies, for 75 percent to have domestic use water supply and latrines and for 60 percent to keep their houses and surrounding adequately clean. Various government agencies are working toward this goal.

A number of studies have found that a majority of the people are not using or maintaining the Government - provided public facilities as intended. The result of the study on drinking water behavior in the rural Northeast done by Santhat Sermsri, et al. in 1982, shows that 96.3 percent of the population do not drink piped water, 97.1 percent do not drink hand-pumped well water, and 98.1 percent still drank water from uncovered, dug wells.

A study on the provision of safe water supplies in rural poverty areas in the Northeast by Nongluk Tunyavanich, et al., in 1984 also shows that, on average for the whole year, 89 percent of the people are drinking open dug well water and 80 percent do not drink hand-pumped water. The studies on drinking water quality, quantity and behavior of rural people in Thailand by Subarn Panvisavas et al., in 1986 yielded similar results showing that majority of rural Northeast people drink rain water in the wet season and surface water in the dry season. A qualitative study under the same title by Orapin Pitakmahaket and Amara Suntorntada in 1986 also found that dug well water is the most common source of drinking water for rural northeast people.

For latrines, the study by Santhat Sermsri, et al. in 1982 found that 60.9 percent of the studied population in Khonkaen use latrines. Another study by Nongluk Tunyavanich in 1984 shows that only 49.7 percent of rural Yasothon Province households have latrines.

The Ministry of Public Health, as the main agency responsible for the health of the population, is well aware of the problem and has been working to ease it for decades. At the current time, primary health care strategies to promote community participation in the construction, improvement and maintenance of sanitary facilities are being emphasized. The village development

revoling fund has been set up in many areas. The villagers can borrow from the fund for the construction of sanitary facilities. A village sanitary craftsman has also been trained for each village. He assists villagers in constructing sanitary facilities for both individual households and the community. Dr. Anant Menaruchi, et al., have demonstrated in a study in the rural northeast that the above-mentioned strategies could effectively improve water supply and sanitation conditions if the villagers were actively involved and the work was done through the village leaders and the established local primary health care volunteers. Both men and women were involved in the process. Such a finding is yet another confirmation that shows that the community participation concept is correct and feasible. Other primary health care research has yielded similar results. However, implementation processes and strategies may be diverse and need further understanding in order to best work out suitable approaches for conditions prevailing of different areas.

Many development agencies are aware of the importance of women in terms of their potentials to be leaders in development as well as in term of their actual valuable participation in development activities. Women play an important household role in water and sanitation. They are the water providers in their families. In the dry season, when water shortage is a problem in the rural Northeast, women travel long distances to fetch water

or they wait a long time for water to seep up in wells. Furthermore, the acceptable sources of drinking water for villagers are limited. Most of the villagers depend on open dug wells which may not be clean for drinking and domestic use water. Therefore, many agencies are trying to promote women's participation in development activities. The Girl Guides Association of Thailand (GGAT) is non-governmental organization which has worked for over two decades in the area of development, especially that of women and youth development in both rural and urban areas. Health is also an area in which GGAT puts an emphasis on. So, in response to the above water problem, GGAT with the endorsement of the Thai Government, has requested and obtained assistance from the United Nations Development Program under project INT/83/003. This was used to fund a pilot, rural, community-based water supply project, a key element of which is the promotion of women's participation and initiation in improving their sanitary facilities. This grant was for a period of two years and used in six target villages. It is expected that at its conclusion this project period the six villages would have adequate water supplies for drinking and domestic use and that the villagers themselves would take care of their own water supplies so that these would be clean and last for the whole year round. Women would contribute their share of maintenance both at the family and community levels.

The Faculty of Social Sciences and Humanities, Mahidol University, with assistance from WHO, (Grant ICP/CWS 005) agreed

to carry out a case study to document and evaluate the GGAT project. It has done this in order that lessons learned may be of use for concerned organizations, including governmental, non-governmental and the community. The evaluation took into consideration all aspects of the project implementation using both quantitative and qualitative research methodologies. The applied research findings will be beneficial for future national development. Furthermore, results from the Thai case study may be compared with those done in other countries in the South East Asia region.

Overall objective of the case study

The overall objective of the case study is to document the process and assess the impact of the GGAT intervention in promoting women's participation and initiation in a village-based water supply and sanitation project in six target villages.

Specific objectives of case study

1. *To make a baseline survey which would serve as an input for the intervention team to guide them in the design of the intervention.*

2. *To record ; (1) the process of the intervention aimed at improving the water supply and sanitation facilities (2) the strategies directed at involving women.*

3. *To make a final assessment, after the intervention, to establish, to what extent the involvement of the women has resulted in an improved functioning and utilization of the water facilities. In addition, the study aimed to find out to what extent the situation had been improved for the women concerned and what were the spin-off effects.*

Chapter 2

Methodology

The overall purpose of the case study was to document and evaluate the effect of the intervention undertaken by GGAT to promote women's participation and initiation in a village-based water supply project. This project was centered on six villages in Surin and Srisaket provinces. Baseline data before the intervention activities started, monitoring the process of intervention and data based on the results of the intervention were all needed to arrive at an assessment of the effectiveness of this intervention.

Baseline information on socio-cultural attributes, community awareness and involvement, sources of water supplies, their condition, utilization, quality and quantity, sanitation, and constraints to women's participation were collected through the use of questionnaires and participant-observation.

During the project, ongoing activities were continuously recorded. Participant observation was also done to find out if there were any physical and behavioral changes in the communities.

For the post intervention data, both interviews and participant-observation were used to collect data concerning water supplies and sanitation. This was done to monitor change.

In addition, information on the training program, community participation and the impact of this training, changes in family incomes and opinions on community development, and participation in water and sanitation development, were also collected.

Study areas and sampling

Since this case study was to document and evaluate the intervention impact in six target villages, already surveyed for baseline data, it was not necessary for the research team to undertake a village selection exercise. The study areas were the same as the intervention areas which had already been identified by GGAT. The original criteria used for site selection by GGAT were as follows :

1. Villages must have identified water supply and sanitation as a problem.

2. Villages must have expressed willingness to collaborate with the project implementers.

3. The area selected must have government agencies present which could provide technical support if required.

4. The area selected must be located within a locale where the outreach of GGAT Northeast branch staff can supervise.

Such criteria were proposed to the National Economic and Social Development Board (NESDB) for review. NESDB asked the Ministry of Public Health to help review the proposal. Their valuable comments were then sent back to GGAT. It was suggested that there were two types of problems concerning water at the village level in the rural area that GGAT might be able to attack. The first one was the shortage problem and the second one was the under utilization and improper maintenance of existing facilities. These suggestions were incorporated with the above set of criteria in site selection.

The case study team, as well as the government officials, such as those in community development, public health, local administration department at the district and provincial levels in Surin and Srisaket, were also involved in the selection of the villages.

As it turned out, after dialogue with local concerned people and a survey of potential target villages, one criterion was added to the above list. This was that other government and non-government agencies not be actively undertaking similar projects in the target areas.

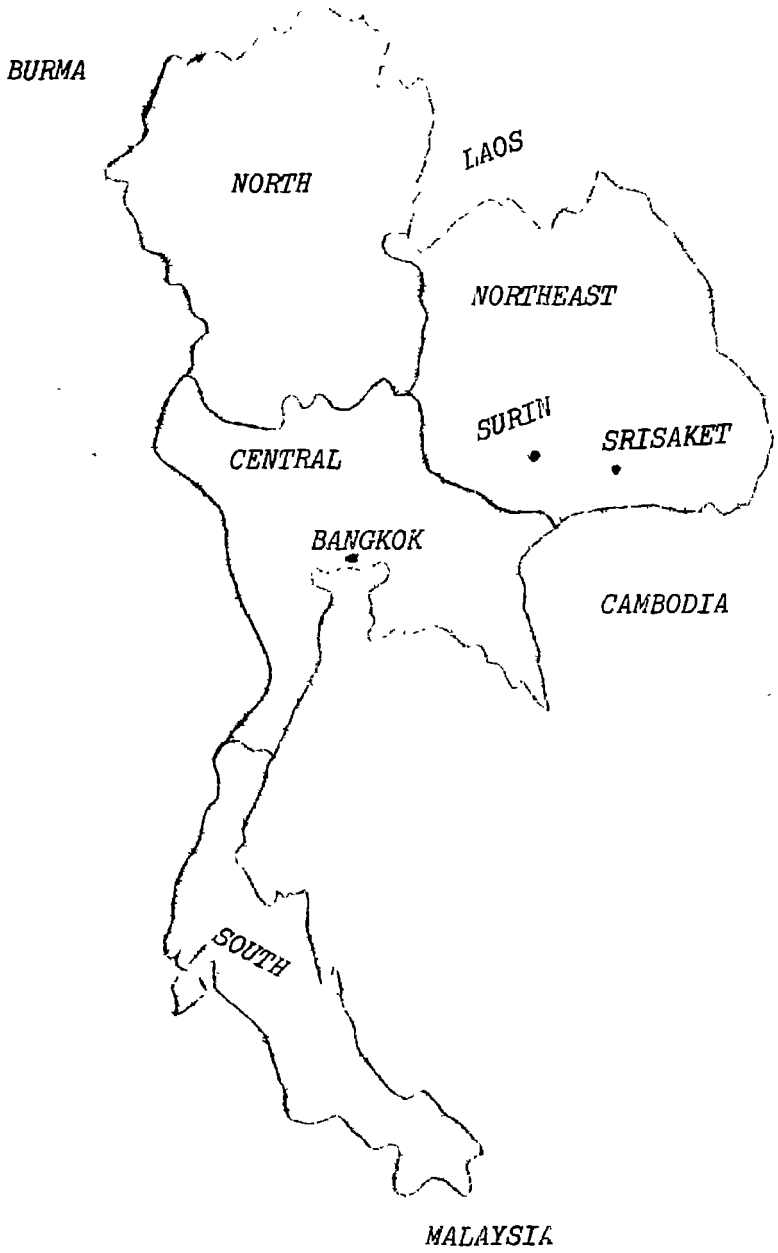
Surin and Srisaket Provinces in the Northeast were selected for the project. Surin is where GGAT's Northeast branch is located and Srisaket is the neighboring province (Figure 1).

Four villages from Surin Province and two villages from Srisaket Province were selected. Their households totaled 461 but only 442 households were pre project surveyed. The other 19 households had either no women or nobody was at home during the data collection period. For the post intervention project survey 414 households were interviewed. The remainder had no one at home or had migrated out (Table 2.1).

Table 2.1 : Number of households by village

Village			Total households	Households in Pre - intervention survey	Household in Post intervention survey
Surin	1.	Ban Bok	41	40	39
	2.	Ban Samrong	60	59	50
	3.	Ban Kwaonoi	58	53	51
	4.	Ban Nonkortong	110	108	100
Srisaket	5.	Ban Jiangwong	85	82	79
	6.	Ban Phapa	107	100	95
	Total		461	442	414

Figure 1. *Map of Thailand and project sites*



In order to collect necessary data for the pre intervention project and post intervention project, different sets of questionnaires were used for different groups of people. The village women were regarded as the main group for information and data from other groups serve as supplementary information. Different "sampling" procedures were employed for different groups of respondents as appropriate.

1. The village women. The wife of the head or a significant woman in every household in the study area was chosen to answer the main questionnnaire (FORM A) for both pre-and post interventions survey. But for the pre intervention survey for baseline data all the women 15 years or older in 50 percent of the households were also interviewed to get data on their daily work routines.

2. The village men. The head, or significant man of every other household, was interviewed in both surveys for his opinion on women's participation in community development work, and in water and sanitation work.

3. The key village informants. The village headman, his village committee, village health communicator, village health volunteer and village sanitary craftsman from each village, were interviewed (along with an inspection by the study team) in the first survey period for information on ; sources and conditions of water supplies in villages, existing local committees and the

roles of women, women's groups, past water supply projects in the community, role of government agencies in community development especially in water and sanitation, health problems in the village, etc. These key informants were interviewed again during the post intervention survey to find out about the process of intervention, problems encountered as well as the outcome of the activities. Furthermore, the women's groups were also added as respondents for the post intervention survey or the second assessment. The data sought included information on the substance and process of each GGAT intervention activity undertaken, an analysis of women's groups and their activities as well as the overall impact of the GGAT activities.

4. The concerned government officials of Surin and Srisaket provinces. This group was interviewed during the second survey period. The officials from the four main ministries, namely, Education, Interior, Agriculture, and Public Health, were asked about how their organizations and GGAT with the participation of the community, in particular the women, collaborated in the provision of water and sanitation. Further, problems and contraints on NGOS and GOS working togethers were also discussed.

5. The GGAT project staff. The GGAT project staff were interviewed as a group during the second data collection period. They were asked about details of the project implementation, their opinions, on how the work was carried out, their expectations

regarding the participation of the women's group as well as constraints on carringing their work.

Study instruments

1. The quantitative data. The quantitative data were collected by the use of questionnaires. These were administered two times, namely, during the pre intervention and post intervention periods. (i.e., before and after the water project implementation).

1.1 Pre-intervention survey

The design of the case study was undertaken by the case study team working in collaboration with GGAT. Both the possible indicators of women's involvement in water supply and sanitation from the inter country workshop on methodology for case studies of women's participation in community water supply and sanitation, Bangkok, May 26-31, 1985 and the terms of reference provided by the World Health Organization, were taken into consideration in the development of study design and survey materials. A preliminary questionnaire was developed and both the questionnaire and study design were reviewed during a consultative meeting attended by the GGAT Project Director, a representative from the Ministry of Public Health, an anthropology professor from Chulalongkorn University, a sociology professor from the National

Institute of Development Administration, the dean of Faculty of Sociology Anthropology, Thamasart University and the Mahidol University case study team. Following the meeting, the participants' comments and suggestions were incorporated in the first draft of the survey questionnaires

The case study work plan and draft questionnaires were submitted to WHO in December 1985. A letter of acknowledgement and request to use the protocol as a guide for other investigators was recieved in response.

The survey materials were pretested in one village in Surin province and further refinements were made based on the pretest experience.

One technique learned from the pretest, and very useful later in data collection, was the way to ask attitude questions. The five-point scale was a little too much for the villagers to handle so an unfolding technique was needed. Each question had to be asked twice. The first question would determine on which side of the scale the respondent stood in the five-point scale. The first response would state whether the respondent is at the upper side of the scale (4, 5) or lower side of the scale (2, 1). Then the question would be asked again to see if it is 5 or 4 for the upper end or it is 2 or 1 for the lower end.

The final version of the baseline survey materials include the following questionnaires :

FORM A : Baseline Data

This form is 18 pages long and consists of 39 questions, some of which have many subquestions dealing with family socio-economic and demographic data, decision making within the household, current women's activities in the village, opinions on women's activities in the village, opinions on various aspects of women's participation, and sources and utilization of water supply and sanitation in the villages. Most of the questions, except the opinion parts, provide the opportunity for the respondents to express their responses freely since they always have an "Others (specify)....." category.

FORM B : Men's Opinion on Women's Participation

This form is five pages long and consists of two main parts. The first is the opinion part in which all questions are identical with the opinion part of the FORM A. questionnaire ; the same opinion questions were asked for both men and women. The second part is on attitudes toward women's participation in community development and on women's participation in decision-making. The Osgood scale is used. There is therefore a set of eight adjective words in each part and the men are supposed to rate their attitudes on this scale.

FORM C : Women's Daily Time Allocation

This form is two pages long. Each page is provided for the off-farming season and for the farming season activities. The questions were all open-ended.

FORM D : Local Key Informants

There are eight pages in this form. The first seven pages are for the village headman and committee for village background information and the last page, on health, for the village health volunteer and communicators.

1.2 Post-intervention survey

The objective of the post intervention data collection was to find out about changes in water supplies and sanitation and about the impact of GGAT intervention in the target villages. Therefore, the data were collected from various sources in various forms, as follows :

FORM A : Main questionnaire

This form is 21 pages long with 77 questions. Some of the questions also have sub-questions. This form covered information concerning ; current water supply sources and adequacy from the villagers' point of view, quantity of water containers, quality

of water, GGAT training provisions, people participation, post-intervention water utilization behavior and opinions concerning new or improved water supplies as well as latrine construction and utilization during the past year. In addition, the respondents were asked to compare their annual income this year and the previous year. The same opinion questions as previously, on community development and women's participation were again asked.

The respondents to this questionnaire were the same women who had answered the baseline data questionnaire during the first round of data collection.

FORM B : Men's Opinion on Women's Participation Questionnaire

This form is four pages long. The respondents were the same men who had responded previously. The first part of the questionnaire dealt with the actual participation of the female members of the family in GGAT intervention activities and what their impact was from the men's point of view. The second part of the questionnaire included the opinion questions on community development and women's participation. The opinion questions were the same as those asked in the first round and same as those asked the women respondents.

2. The qualitative data. The qualitative data were collected during participant observation and in depth interview.

2.1 Participant observation. Participant observation was employed before the project started, during the implementation and during the post data collection period in four out of the six villages. A guideline was provided for the participant-observers. Three chosen villages were in Surin and one was in Srisaket. Choices were based on the availability of manpower and budget. The easiest access village in Surin had to be excluded from formal participant-observation but was covered by periodic visits and was observed by the research team. The two villages in Srisaket are connecting villages so the participant observer could stay in one but also observes certain things in the other since they share a number of facilities such as public water sources, a school, and a temple.

2.2 Depth interviews. The depth interview technique included the following quidelines for different groups of people.

a) Quideline for depth interviews with village leaders and womens groups. The main information elicited was implementation process and outcomes of GCAT interventions during the past year, the formation of women's groups, selection of representatives and their activities, the impact of GCAT intervention

activities on water supply and sanitation and the overall assessment of changes within the village during the past year.

b) Guideline for depth interviews with the GGAT staff. The objectives covered included GGAT intervention activities in working with women, a number of GGAT staff and their responsibilities and experiences, work processes in the project, problems and constraints encountered, solutions to such problems and expectations at the end of the project were covered under this guideline.

c) Guideline for depth interviews with local government officials. This guideline for local officials covered mainly the working relationships between governmental organizations (GO) and non-governmental organization (NGO), the communication and cooperation between GO's and NGO's, problems, constraints and solutions, and views of local officers on the contribution of the NGO's.

Data Collection and Quality Control

1. Recruiting and Training of Interviewers

For the interviewers (10) were recruited from the local area. They were all native of the Northeastern region and spoke the local dialects. For both pre and post intervention surveys

they were taught about a) the objectives and design of the research, b) interviewing techniques, c) sampling techniques and d) administrative procedures. Then, they were trained to use structured questionnaire, to record respondents' answers, to use non-directive probing techniques and to provide respondents with appropriate feedback to encourage precise answers. Interviewers were also trained how to contact potential respondents and how to encourage participation without being too pushy. After the training the interviewers were paired up to practice interviews using four common languages in the area, Thai, Laos, Cambodian and Suey. Comments on the weak and strong points of the performance were provided.

For participant-observers, four social science master candidates of Mahidol University were recruited. There were three rounds of observation made, i.e., a pre-project data collection, that during the project implementation and a post-project collection. The same students were used for all three rounds. These students were provided with intensive training in observation techniques from anthropologists associated with Chulalongkorn, Thammasart and Mahidol Universities.

2. Field work and Quality Control

2.1 The survey

The first round of surveys was done during the March 15-26 period of 1986 and the second was done during April 19-30, 1987. The data collection for both was done village by village. The whole team went to one village and completed its task before moving to the next one. The research team supervised the interviews very closely throughout the period. The completed questionnaires were checked by the research team daily for completeness and accuracy. It was very imporaant that all the questionnaires be checked and completed while the interviewers were in the villages. Problem ones could then be corrected right away. There were four supervisors for the ten interviewers.

2.2 Participant observation

For the first round of participant-observation the students, each lived in four of the selected villages for six weeks from March 15 to April 30, 1986 to observe and record the behaviors and attitudes of the people. An observation guideline developed by the research team and provided for the observers. The students were supervised by the researchers and the principal investigator who coordinated the overall case study work.

After four weeks of observation a meeting was held in Surin province where the participant observers presented the results of their observations to the research team. Besides reviewing the progress of the work and getting feedback from the research team, it was also a great opportunity for the observers to share their experiences and techniques among each other. At the end of the six weeks of observation, the observers presented the data obtained to their anthropologist trainers associated with Chulalongkorn, Thammasart and Mahidol Universities, to the GGAT intervention team, and to the Mahidol research team. Valuable comments were recieved from the anthropologists as to how to interprete the information gathered and what to look for future observations. It was also a good time for the intervention team to learn from the observers' point of view, and to seek in-depth data from the observers as well as share their thoughts.

The second round of participant observation was done during the September 27 to October 19, 1986. Reorientation training and an observation guideline were provided for the four students. They were to observe any changes taking place in the village and compare these to the situation first observed at beginning of the year. Special attention was also to be paid to water utilization behavior during the rainy season. The first observation was during the dry season and the second one was during the rainy season. After the observation, the findings were presented to the GGAT

project staff and other concerned people. The students were supervised by the research team throughout the period.

The third round participant observation was carried out during April 18 - May 3, 1987. Reorientation training and a review of the guidelines were done before the students were sent out to live in the villages. In addition to observing physical changes in sources of water supplies and in latrines, the behavioral and attitudinal changes of the people, special attention was paid to the feelings and reactions of the villagers towards the changes. This observation occurred one year after the first.

2.3 Depth interview

Depth interviews were done twice, before and after the project intervention. The informants were the village leaders, knowledgeable villagers, women, GGAT staff and concerned government officers. There were guidelines for the interview of each group. The data were recorded on paper and also on tape.

Data Processing and Analysis

Interviews were coded by 12 well trained coders. After their training they were all asked to code the same interview and their choices were compared and discussed to help clarify code boundaries for open-ended responses. The main questionnaire

was coded first followed by supplementary questionnaires according to the code book developed by the research team. The code values for most responses were already assigned in the codebook so coders only needed to transfer these values to codesheets. However, the supplementary questionnaires for the baseline data, for women 15 years and older, for their daily time allocation, created a slight problem since they were open-ended responses and the responses recieved had different degrees of detail and the activities varied from person to person. The research team grouped various detailed activities into manageable numbers of categories. Therefore, not all details mentioned by the respondents can be fully presented. The answers from depth interviews were not coded. They were analysed by the research team.

Throughout the coding operation, the research team were the coding supervisors. Ten percent of the interviews were selected at random to double check the accuracy of the coding and the results were satisfactory.

After coding, the code sheets were turned over to professional key punchers to transform the information therein into a computer analysable set of data for analysis. The SPSSx software program was used for data analysis for this case study. The quantitative data were presented in the forms of frequency, percentage, mean and cross-tabulation. A T-test and Chi-square

test were utilized to test the relationship between interest variables. Throughout the presentation of the findings, the qualitative data were incorporated to provide a clear and complete picture of the implementation process as well as the impact of the GGAT project. The don't know or missing categories were not included in the calculation of most tables.

After the report was completely written a draft was sent to all concerned agencies and a consultative meeting among those agencies concerned, namely, the Girl Guides Association of Thailand, related governmental organizations from both the central and local offices, academicians, and the research team, was held on November 9, 1987 to discuss the findings as well as the conclusions and recommendations. This meeting was held to make sure that the results are soundly concluded and the recommendations were appropriate for guidance purposes.

Chapter 3

Socio-economic Conditions and Village Development Before Project Implementation

Socio-economic condition of project area

All the villages in the project area were established about 60 to 100 years ago except Village 4 which is only 16 years old. There is only one cluster of households in each village except for Villages 5 and 6. There, the clustering is scattered in three areas. Sizes of the villages vary from the smallest, 41 households or 315 people in Village 1, to the biggest of 110 households or 673 people in Village 4. The average number of people in each household is 5.8. The roads to all the villages are made of laterite or a combination of laterite and dirt. All roads to the villges are usable all year round but not very convenient during the rainy season. The laterite roads range in length from three kilometers in Village 3 to 27 kilometers in Village 2. All of the villages except Village 3 have a mini-commuter bus running between the village and the district centre. There is about one trip per day. Village 3 people have to walk to the main road to catch the bus to town.

Three of the villages have access to electrical power. However, only 70 percent of the households are using electricity.

Those whose households do not have the power connected or those living in villages without access to the power, usually utilize karosine lamp as a source for lighting. There are only a few households who use batteries as a source of lighting.

For religious purposes, there are residences for monks in Villages 1 and 3, buddhist temples in Villages 4 and 5. Villages 2 and 6 have to depend on other villges' facilities for religious ceremonies. For school, only Village 6 has an elementary school in the village. The children of the rest of the villages have to go to elementary schools of nearby villages about 1 to 3 kilometers away. All the children who wish to continue to secondary school have to go to the district centre which is more than 10 kilometers from the village.

For the educational level of the villagers in the project area, it was found that a majority of the people had finished compulsory education (under old system) which is grade 4. However, men have more education than women. There are 19.7 percent of women but only 11.6 percent of men who have never gone to school. Villages 1, 2, 3 and 4 have no newspaper reading centers while Villages 5 and 6 have a center but without reading materials. Only 10 percent of the households in the project area own a television set but radios are available in most of the households.

The main occupation of all villagers is rice-farming. Second occupations include sugar cane, jute, and maize planting and being employees. For some women their second occupation is weaving.

About 68.3 percent of the households own farmland. The average size of a farm is 16.2 Rais (1 Aere = 2.5 Rais). All farming depends on rain fall only because there is no other source of water.

About 84.8 percent of the households have no other source of income except from their main and second occupations. The rest of the people, who have other sources of income, get it from relatives who work elswhere, pensions and other sources. The average annual income of a family is 17,712 baht or about 3,053 baht per person per year. This is lower than the average income for the rest of the province. (The average annual income per capita of Surin and Srisaket provinces from the National Economic and Social Development Board Statistic for 1985 is 6,995 and 6,483 baht). The average annual income per family of the four villages in Surin is 18,789 baht. This is higher than that of the two villages in Srisaket which is 16,171 baht.

Regarding the debt situation, 78.0 percent of the people are in debt to the extent of 4,617 baht per family. part of the debts are loans for farming purposes. It was also observed that,

in addition to the monetary loans, some people, such as those villages 3 and 5 also mortgage their land to buy seed and eating grain and fertilizer. Some people use rice to pay back their debts as well.

Approximately, 17.5 percent of the households have average savings of 4,136 baht. For those with savings, the savings for 53.0 percent of them is less than 500 baht. Therefore, it may be said that there are few families with savings and the amounts of savings for many of them are small. However, there are 9.7 percent of the families who give out loans. The average amount given out is 5,805 baht per family. (Table 3.1)

Table 3.1 Socio-economic and demographic characteristics of households in project area

Description	Village						Total
	1	2	3	4	5	6	
Number of people in the households							
Less than 5	66.7	45.8	62.3	50.0	47.6	54.0	52.9
6 - 9	33.3	49.3	35.8	46.3	50.1	43.0	44.1
10	-	4.9	1.9	3.7	2.3	3.0	3.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	59	53	108	80	100	438
$\bar{X}$	5.1	6.1	6.7	5.7	5.7	5.6	5.8
Education (female)							
No education	21.1	8.5	20.0	14.8	32.9	19.0	19.5
Lower than grade 4	10.5	15.3	25.5	7.4	8.5	13.0	12.4
Grade 4	68.4	74.6	49.1	74.1	56.1	66.0	65.4
Higher than grade 4	-	1.7	5.5	3.7	2.4	2.0	2.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	59	53	108	82	100	444

Table 3.1 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Education (male)							
No education	8.3	10.3	15.4	7.3	17.5	12.2	11.7
Grade 4	87.5	89.7	80.8	87.3	72.5	83.8	83.3
Higher than grade 4	4.2	-	3.8	5.4	10.1	4.0	5.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	24	29	26	55	40	49	223
Main occupation							
Rice farming	97.4	81.4	85.5	91.7	92.7	89.9	89.8
Employee	2.6	18.6	7.3	4.6	4.9	5.1	6.8
Trader	-	-	-	2.8	-	1.0	0.9
Government service	-	-	-	-	-	1.0	0.2
Housewife and no occupation	-	-	7.2	0.9	2.4	3.0	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	59	53	108	82	92	432

Table 3.1 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Second occupation							
No second occupation	42.9	49.1	38.2	55.6	53.7	73.5	55.2
Farmer	-	3.6	1.8	1.9	3.6	2.0	2.3
Employee	28.6	18.2	23.6	9.3	14.6	7.1	14.3
Trader	14.3	10.9	9.1	5.6	12.2	3.1	8.1
Silkworm raising and Weaving	8.6	9.1	16.4	19.4	12.2	3.1	11.8
Animal raising	5.7	7.3	7.3	2.8	3.7	4.1	4.6
Others	-	1.8	3.6	5.6	-	7.1	3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	35	55	53	108	82	98	431
Other source of income							
None	84.2	89.8	81.8	91.7	87.7	73.7	84.8
Pension	2.6	1.7	1.8	-	-	2.0	1.1
Given by children or relative	13.2	6.8	14.5	7.4	12.3	24.2	13.4
Rent, interest	-	1.7	1.8	0.9	-	-	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	59	53	108	81	99	438

Table 3.1 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Mean family income/year	6,986.84	24,068.97	21,616.36	18,666.67	11,997.56	19,628.28	17,712.20
N	38	58	53	108	82	99	438
Mean family income/year of Villages 1-4 (Surin)			18,789.19 baht				
Mean family income/year of Villages 5-6 (Srisaket)			16,171.26 baht				
Mean of debt/family	3,392.11	7,271.19	7,180.1	4,475.93	3,068.29	3,529.0	4,616.97
N	38	59	53	108	82	100	440
Mean of loans given out/family	11,600.00	11,900.00	960.0	3,175.0	3,433.33	3,577.78	5,804.6
N	8	6	5	12	3	9	43
Mean of savings	1,233.33	10,108.35	3,580.0	3,853.57	3,245.45	1,300.0	4,135.90
N	3	12	10	28	11	14	78

Table 3.1 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Farmland ownership							
None	10.5	22.0	21.8	8.3	4.9	8.0	11.3
Own some land	76.3	55.9	43.6	81.5	70.7	70.0	68.3
Rent from other	5.3	6.8	20.0	2.8	6.0	6.0	6.8
Own some land but rent out	-	5.1	5.4	3.8	2.0	2.0	3.4
Own some land and rent some	7.9	10.2	9.1	3.7	14.0	14.0	10.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	59	53	108	100	100	440
Mean land used for farming (Rai)	12.2	24.7	21.2	20.4	10.5	11.1	16.2
N	36	49	42	100	78	92	397

Health service system and common diseases in project area

According to the government health service system, there is a health center in every district. There are also village health volunteers (VHV) and a number of village health communicators (VHC) depending on the sizes of the villages. There is one VHC for every 10 households. None of the villages in the project is located near a district health center. In addition, there are only five villages with VHVs. The VHV for Village 3 died sometime ago and no one was trained to take his place. His wife is acting in his place but the villagers do not have much faith in her because she does not have any training.

The most common diseases for all 6 villages for the past year, as reported by the village leaders, VHVs and VHCs, are common cold, diarrhea and conjunctivitis.

Village development scheme before the project implementation

1. Government organizational structures and personnel responsible for village development are as follows :

1.1 Village organization. The village headman who is elected by the villagers is the leader in a village committee to carry on the task of administration and development of the village. The village committee usually has 7-10 members and

responsibility is functionally divided into seven areas, namely, administration, public health, education and culture, defence, social welfare, finance, and village development and vocational promotion. There may also be a sub committee in each of the areas to help carry out tasks. In villages in sensitive areas, there may be a voluntary self-defence committee instead of the above type of committee. The operations of this latter committee are the same as the former except that it receives more support and training for self-defence and development.

1.2 Governmental organization. The four main ministries responsible for the development of villages include, Agriculture, Public Health, Education and Interior. All of them work together in intersectoral collaboration and through these established village organizations. Each Ministry corresponding with an appropriate sector has an office at the district level. The Public Health Ministry also has a center at the subdistrict level.

Community participation is the concept used in all sectors for village development. Village groups may be set up to carry on development work. For example, a village health volunteer, a village health communicator and a village sanitary craftsman may work on for public health projects ; a youth group, a women's group and a savings group may work on an Interior Ministry

project are other similar projects ; agricultural leaders, a vocational group may work on an agricultural project ; and a volunteer teacher group may teach the illiterate for the Education Ministry or for an NGO.

1.3 Non-governmental organization. There are a number of non-governmental organizations working in village in the area of development. These organizations may have different concepts and different methodologies in working, however, the ultimate goal is also to improve the quality of life of the villagers. Examples of non-governmental organization working in the rural areas are, the Thai-Canada Village Development Fund, Education for Life and Social Foundation, Appropriate Technology Association, Girl Guides Association of Thailand, etc.

2. The village organizations working in the area of water supply and sanitation may be divided into three public sectors as follows :

2.1 Public health sector. The public health sector has direct responsibility for the development of village water supplies and latrines (provision of water supply sources, water storage containers and construction of latrines) as well as for the quality of the development of those facilities (safe water supply and sanitary latrines). The output from such work can be

seen in the forms of well construction and improvement, rain water jar and tank construction, and the promotion of latrine construction in the villages. The implementation is through established primary health care volunteers, such as village health volunteers, village health communicators, and village sanitary craftsmen all of whom use the sanitary revolving fund in the village.

2.2 Interior sector. The community development workers of the Ministry of Interior represent this sector for those who work in the local areas. The community development workers motivate and promote the development activities in the villages including water supplies and sanitation, the main problems in the rural northeast of this country. Implementation is carried out through the village headman and village committee or sometimes through the sub-district council which utilize the budget from the Rural Job Creation Project.

2.3 Other sectors. As mentioned earlier, water supply shortage is a severe problem of the northeastern region, therefore many governmental and non-governmental organizations are working on this problem in the region, e.g., Mineral Resource Department and Regional Military Office, etc. In 1987, the Ministry of Interior set up a policy to promote the provision of rain water jars all of the rural population to celebrate the 60th birthday of His Majesty the King. Many organizations participate to help achieve this goal.

3. *The water supply and latrine facilities before project implementation are presented in Table 3.2*

Table 3.2 Water supply sources, water storage containers and latrine facilities before the project implementation by village

Description		Village					
		1	2	3	4	5	6
1. Water supply sources (number)							
Drinking	Dug well (public)	1*	1	1	1	6.2*	2.3*
	Pond	-	-	1	-	-	-
Domestic use	Dug well (public)	1*	-	-	4	11.2*	4.3*
	Hand pump deep well	-	-	-	1	-	1
	Dug well (private)	4	1	1	18	5	6
	Hand pump shallow well	-	-	-	6	2	14
	Pond	1	1	2	-	1	2
2. Water shortage problem (%)							
Drinking		79.5	94.9	96.8	73.1	78.0	88.0
Domestic use		71.8	83.1	86.8	65.4	31.7	56.0

Table 3.2 (Continued)

Description	Village					
	1	2	3	4	5	6
3. Water storage containers (number)						
Big cement jar	34	1	12	-	11	23
Cement tank	-	1	-	-	1	1
4. Latrine (number)	3	-	5	16	9	16

*Dug well with cement casing

Note : 1. The one public dug well for drinking and domestic use in Village 1 is the same for both uses.

2. There is only one pond for drinking and domestic use in Village 3.

3. The hand pump deep well in Village 6 is not utilized because of the high iron content.

The water supply sources and latrine facilities from Table 3.2 indicated that the water supply sources of Villages 1, 2 and 3 are very few in comparison to Villages 4, 5 and 6. However, a majority of the people in every village still feel that they have a drinking water shortage problem (the range is from 73.1 to 96.2 percent). For domestic use water, the feelings about the water shortage problem differ among different villages. Those villages with more sources feel that they have less domestic use water shortage problem than these with a lesser number of sources (the range is from 31.7 to 86.8 percent).

About the large water storage containers, there are not many in any of the villages. Village 2 only has one big cement jar (capacity 1,000 - 2,000 liters) and one cement tank (capacity 3,000 - 5,000 liters) while Village 4 has none of these two types of containers. Village 1 however, has 34 big cement jars but only 33.3 percent of the big cement jars in Village 1 are used for storing drinking water, 11.4 percent are used for storing domestic use water and 55.3 percent are not used for any purpose.

For latrines, there are very few in all villages especially Village 2 which has none. The highest number of latrines in a village is 16 and they are located in Villages 4 and 6.

In considering how the villagers go about getting the water supply sources and latrines, it was found that all the dug wells were all made by the villages, most of the hand pump deep wells and ponds were provided by government agencies such as the Accelerated Rural Development Office, Ministry of Public Health, Community Development Office, and the Rural Job Creation Project. In the same way, the big cement jars and tanks were also supported by government projects such as the by the Rural Job Creation Project. For latrines, the villagers constructed and paid the cost for their own except in Villages 5 and 6 some of the materials for these were supported by the Ministry of Public Health (Table 3.3)

Table 3.3 How water supply sources, containers and latrines were obtained by village

Description	Source of support to construct facilities					
	Village					
	1	2	3	4	5	6
Dugwell	SH	SH	SH	SH	SH	SH
Handpump deep well	-	-	-	ARD	MOPH	MOPH
Pond	RJCP	RJCP	SH, RJCP	-	RJCP	RJCP, CD
Big cement jar	RJCP	MOPH	RJCP, MOPH	RJCP	RJCP, MOPH	RJCP, MOPH
Cement tank	-	MOPH	-	-	SH	SH
Ceramic jar	SH	SH	SH	SH	SH	SH
Latrine	SH	-	SH	SH	SH, MOPH	SH, MOPH

SH = Self-help

ARD = Accelerated Rural Development Office

MOPH = Ministry of Public Health

RJCP = Rural Job Creation Project

CD = Community Development Office

4. Pre-project water utilization behavior of people

4.1 Drinking and domestic use water supply sources.

Table 3.2 and 3.3 show that villagers from all six villages use dug well water as a main source for drinking (dug well are generally located outside but close to the village). Rain water stored in ceramic jars is used during the rainy season. Rain water does not last very long because of the limited capacity of the ceramic jars. On average, there is 1.5 ceramic jars in each household of about 180-300 liters in capacity. Hence, each year the villagers face drinking water shortage problems when the dug wells dry up or yield small amounts of water. Village 5 however has a large amount of water available from ground water supplies.

The main reasons for the villagers' choice of dug wells as sources of drinking water include taste, clearness and cleanliness of the water. These reasons are traditional and may not be scientifically correct. Water from handpump, deep wells is not used for drinking but for domestic use. However, hand pump deep well in Village 6 is not used at all for any purpose because of the high iron content.

For domestic use water, a variety of water sources are used according to the conditions in each village. The villagers usually utilize the most convenient source for them

(It is very different from choosing drinking water sources ; people specifically choose only the best sources for drinking). Often ponds, which were intended to be the source of domestic use water in the dry season when constructed, after a period of use, are used by buffaloes or become defunct because of the drought. In Village 3 however, the pond water for drinking and domestic uses are used during the drought.

4.2 The provision of water and its daily consumption. Patterns was monitored through anthropological methods of data collection. It was found that, on average, each person used 3.2 liters of water for drinking and 33.6 liters for domestic use daily. This amount of drinking water is higher than the standard figure supplied by the Ministry of Public Health. This behavior difference is because before drinking from a common cup or dipper, villagers usually rinse them. More water is also usually taken out than needed at drinking times and the leftover amounts are thrown away.

Table 3.4 Provision of water and amount of consumption daily by village

Description	Village						Total
	1	2	3	4	5	6	
1. Amount of water consumption/person/day							
Drinking	2.0	1.9	-	3.24	5.68	-	3.2
Domestic use	39.2	33.2	-	27.1	35.1	-	33.6
2. Water fetcher							
Children (< 15 years)	12.5	5.2	7.5	3.7	1.2	3.0	4.5
Women	67.5	74.1	52.8	63.9	75.0	65.0	66.7
Men	20.0	15.5	32.1	19.4	11.3	24.0	20.1
Combination of above	-	5.2	7.5	13.0	12.5	8.0	8.7
3. Water fetching							
Number of trips/day	4.1	1.8	1.7	2.9	4.4	2.6	2.9
Time used (min)/trip (No wait)	20.0	41.0	28.3	20.5	10.9	29.4	24.1
Time used (min)/trip (longest wait)	80.5	168.6	113.5	69.2	32.1	94.1	99.6

The lesser amounts of domestic use water consumed daily (less than the standard 45 liters per person per day) are also due to the people's behavior. People do many activities, such as bathing and washing, at the water sources and these amounts of water cannot be measured. The above-mentioned figure of 33.6 liters per person per day is the amount used at home (Table 3.4)

A majority of the water fetchers (66.7 percent) are women. On the average, each family fetches water 2.9 times per day and each trip takes 24.1 minutes if there is no wating time. An average of 99.6 minutes is taken for periods of longest waiting time (i.e. in the driest time of the drought). In the dry season in Village 2 people have to wait over-night to get drinking water because of the slow seepage and the great number of people waiting. The method of drawing water from the wells is for each individual to use a bucket and string or stick. Water is then carried home by hand, on the shoulder, or by a push cart. Water is usually spilled during transport because there is no effective protection (Table 3.4).

5. Defecation and waste disposal behaviors. Only 13 percent of the people in the project area own latrines. Those without latrines use the fields for defecation. However, a majority of the villagers said that they would like to have latrines because

of convenience and safety. Among those who already have latrines a majority said they use latrines because of the privacy and the convenience. They did not mention the health benefits of the latrine except a majority of people in villages 5 and 6 who gave health benefits as their reasons for using their latrine.

For waste disposal in the household, a mojority of the people have the correct practice for handliny the garbage. They burn, bury or dump it in the fields far from houses. But for waste water, most of them still leave as is (Table 3.5).

Table 3.5 Defecation and waste disposal of villagers by village

Description	Village						Total
	1	2	3	4	5	6	
1. Daily defecation practice							
Use latrine	15.0	-	7.5	18.5	13.7	25.0	15.0
Use the field	85.0	100.0	92.5	81.5	86.3	75.0	85.0
2. Reasons for using latrine							
Disease prevention	20.0	-	-	38.1	72.7	52.2	42.9
Cleaner than using the field	20.0	-	75.0	14.3	9.1	13.0	17.1
Privacy	10.0	-	-	14.3	9.1	17.4	12.9
Convenience	50.0	-	25.0	33.3	9.1	17.4	27.1
3. Need for latrine							
Already have latrine	15.0	-	9.6	16.2	12.7	18.4	13.0
Not have and not want	10.0	11.9	5.8	4.5	6.3	6.1	6.8
Not have but want to have	75.0	88.1	84.5	79.3	81.0	75.5	80.2

Table 3.5 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
4. Reason for those who want latrine							
No reason given	-	-	-	-	2.6	1.0	0.7
Safety	5.3	21.1	17.3	20.8	20.5	28.6	20.7
Convenience	44.7	57.9	46.2	40.6	35.9	27.6	40.1
Safety and convenience	50.0	21.0	36.5	38.7	41.0	42.9	38.5
5. Waste disposal							
Garbage : Burn	79.5	72.9	60.4	75.0	62.0	67.0	69.2
Bury	7.8	3.4	32.1	9.4	12.7	11.0	12.1
Leave as is	12.8	23.7	7.5	15.7	25.3	22.0	18.7
Waste water :							
Drainage system	16.7	7.0	23.1	15.7	18.5	18.2	16.6
Leave as is	83.3	93.0	76.9	84.3	81.5	81.8	83.4
Animal waste :							
Bury	65.6	31.9	49.0	48.5	51.3	51.1	46.9
Throw away	28.1	52.2	28.6	40.4	43.8	41.5	43.1
Leave as is	6.3	14.9	22.4	11.1	5.0	7.4	10.5

Chapter 4

Women's Participation in Community Development Activities Prior to the GGAT Project

Women's potential before the GGAT project

The background and experiences of village women give some indication of their developmental potential as well as the potential they have to participate in the village-based water supply and sanitation project. Three areas of interest for consideration are as follows :

1) The duties and responsibilities of women in daily life,

2) Decision makers and participation of women at household and community levels, and

3) The training and experiences of women.

1. The duties and responsibilities of women in daily life. To provide a clear picture for the analysis, information on the daily time allocation of women 15 years and older during the farming and off-farming seasons, is presented in Table 4.1. The time allocations presented are divided into four spans, namely, before breakfast, after breakfast, after lunch and after dinner.

From Table 4.1, it is shown that, outside the farming season, the main responsibilities of women are housework, such as preparing food, cleaning, fetching water and looking after children. In addition, women also do some work to earn money, this includes raising animals and weaving. These duties are usually heavier in the morning and get gradually lighter as the day goes on. After dinner, duties usually cease and it is time for rest.

During the farming season, the duties and responsibilities of women are heavier than in the off-farming season. Rice farming is another duty that is then added to women's daily schedules. About three fourths of the women have to work on the farm throughout the day starting as early as day break. Housework including preparing food also remains the responsibility of women. The time to rest for most women is after dinner and after a hard day's work.

Information in table 4.1 also demonstrates that some of the women have to fetch water. Even though the figure mentioned is only 30 percent, from observation it was found that the water fetching responsibility is mainly that of the women and girls who are less than 15 years of age.

Table 4.1 *Daily time allocation for women 15 years and older (Each person can do more than one activity during each period)*

Off-farming season (%)		*During farming season (%)*	
1. *Before breakfast*		1. *Before breakfast*	
Preparing food	68.9	*Working in the field*	69.3
Fetching water	32.5	*Preparing food*	62.1
Others, ie., housework, tending animals	45.6	*Others, ie.,housework, tending animals*	16.0
Doing nothing	13.6	*Doing nothing*	11.7
2. *After breakfast*		2. *After breakfast*	
Looking after children, housework, fetching water	26.8	*Working in the field*	77.5
Tending animals	15.7	*Looking after children*	9.3
Weaving	10.3	*Doing nothing*	13.2
Hunting for fuel(wood)	16.4		
Doing nothing	30.8		

Table 4.1 (Continued)

Off-farming season (%)		*During farming season (%)*	
3. *After lunch*		3. *After lunch*	
Doing housework and Looking after children	*78.4*	*Working in the field*	*76.7*
Fetching water	*13.9*	*Preparing food*	*43.8*
Tending animals	*14.2*	*Others*	*16.2*
Weaving	*13.9*	*Doing nothing*	*14.4*
Doing nothing	*39.9*		
4. *After dinner*		4. *After dinner*	
Doing housework	*13.7*	*Doing housework*	*10.6*
Other, ie., watching television	*19.9*	*Others, ie., watching television*	*4.8*
Doing nothing	*76.8*	*Doing nothing*	*84.8*

Note : During each period of time, each woman has a variety of activities. The percentages presented above indicate percent of people doing each activity during each period. For example, before breakfast in the off-farming season, 68.9 women out of 100 prepare food, 32.5 women out of a 100 fetch water, etc.

2. *Decision makers and participation by women at the household and community levels.*

Table 4.1 indicates that women are playing a substantial role both in the household and the farm. Decision-making and participation in development activities are another aspect to reflect the status and potential of women. In tables 4.2 and 4.3 it is shown clearly that the decision-making on the careers and economics of those in households is the joint responsibility of both husband and wife. However, if the matter relates to the community, such as community development, the husband takes a leading role in making decisions. But if it is solely a family matter like being the pocket holder of the household, then a majority (86.7 %) of women are responsible.

In participation in community development activities, there are fewer women than men participating in all activities. The participation of women is especially low when it comes to decision-making. The participation by women, through providing labor, is quite high but still lower than that of men. It is also to be noted that in water supply improvement activities, the participation of women is less than their participation in other activities.

Table 4.2 The responsibilities and decision-making of women by village

Description	Village						Total
	1	2	3	4	5	6	
1. Pocket holder of family							
Wife	76.3	89.8	81.8	80.6	89.0	96.0	36.7
Husband	15.8	10.2	7.3	9.3	2.4	3.0	7.0
Separate pocket	7.9	-	9.1	2.8	4.9	1.0	2.5
Other	-	-	1.8	7.3	3.7	-	3.8
2. Sale of farm products							
Wife	21.2	25.9	25.0	14.4	12.4	14.7	17.5
Husband	21.2	14.8	28.9	30.8	32.1	24.2	26.4
Wife and Husband	55.3	59.3	44.2	53.8	50.6	60.0	54.2
Others	2.6	-	1.9	1.0	4.9	1.1	1.9
3. Loans for farming purposes							
Wife	18.9	18.2	31.7	17.1	11.0	10.3	16.6
Husband	16.2	25.4	19.2	27.6	34.1	33.0	27.8
Wife and husband	64.9	56.4	48.2	54.3	48.8	54.6	53.7
Others	-	-	-	1.0	6.1	2.1	1.9

Table 4.3 Participation in community development activities of women and men

Description	Village clean-up	Activity water supply improvement	Temple development	Road construction or improvement
1. Participation in the activity				
Women	47.0	24.4	49.7	64.9
Men	71.7	57.6	75.3	95.5
2. Decision-making				
Women	9.6	2.3	10.1	9.5
Men	26.3	15.7	24.3	22.3
3. Provision of labor				
Women	26.3	13.0	13.1	41.2
Men	25.9	27.3	20.5	66.7

3. *The training and experiences of women*

A number of organizations are carrying on community development activities in many villages to improve quality of life. Many of those activities have training components of various types. However, men usually have more opportunities to attend them than women. The direct and indirect opportunities to strengthen women's potential to participate in activities are presented in Table 4.4

Table 4.4 The readiness of women to participate in community development activities by village

Description	Village						Total
	1	2	3	4	5	6	
1. Reading newspaper							
Never	71.8	79.7	52.9	66.7	69.2	67.1	67.7
Sometimes	28.2	20.3	47.1	33.3	30.8	32.9	32.3
2. Listening to radio							
Never	33.3	22.0	5.6	16.7	26.8	19.2	20.0
Sometimes	66.7	78.0	94.4	83.3	73.2	80.8	80.0
3. Watching television							
Never	94.9	88.1	75.0	53.7	37.8	27.0	55.5
Sometimes	5.1	11.9	25.0	46.3	62.2	73.0	44.5
4. Being a group member							
Never	74.4	72.2	74.5	93.8	88.9	90.9	85.1
Sometimes	25.6	27.8	25.5	6.2	11.1	9.1	14.9
5. Attending training on water and sanitation							
Never	60.5	81.4	88.5	90.7	86.4	90.7	85.8
Sometime(wife)	26.3	15.3	-	-	3.7	2.1	5.5
Sometime(family member)	13.2	3.4	11.5	9.3	9.9	7.2	8.7

Table 4.4 indicates that a majority of women have never been exposed to mass communication through newspapers and television. For the most common mass medium, the radio, a majority of women have had some experience in listening. However, those who have never listened to radio range from 5.6 - 37.3 percent. For the experience of joining village groups, about three fourths of them have never been members of any group at all. When the women were asked about participation in the training on water and sanitation, most of them said they have never attened such training. The exception is the women in Villages 1 and 2 which have 26.3 and 15.3 percent respectively of such women.

Opinion of men and women on women's participation in village development

When the women and men were asked about their opinions on the promotion of women's participation in development activities in the village, the results were quite positives. Both men and women seem to accept such women's roles and the importance of women's participation in development activities. Table 4.5 shows that only 32.9 and 35.2 percent of women and men agreed with the negative statement that "If a woman participates in community development activities, it will affect her housework", but only 40.8 of women and 45.4 of men agreed that women are capable of being community leaders. It is to be noted that more than half of both

men and women disagreed with the statement that "Fetching water should be the men's job". This opinion coincides with the fact that fetching water has now become an acceptable women's responsibility in the village. In general men expressed their acceptance of women's participation in various aspects of community development. This is shown in their responses in Table 4.6 and 4.7.

Table 4.5 Opinions of men and women on women's participation in community development and household activities

Statement	Agreement with statement	
	women (N=442)	men (N=227)
1. Women and men can participate equally in community development activities	85.6	83.7
2. If a woman participates in community development activities it will affect her housework	32.9	35.2
3. Decisions for choosing water sources and facilities should be those of men's only	60.8	71.8
4. Women are capable of being community leaders	40.8	45.4
5. If a family is to decide on spending a large amount of money, the women should also have a say	83.9	88.5
6. Women's opinions are acceptable	80.7	82.4
7. Housework is not heavy work	56.0	70.0

Table 4.5 (Continued)

Statement	Agreement with statement	
	women (N=442)	*men (N=227)*
8. *Fetching water is not heavy work*	50.3	54.2
9. *Men and women are equally good in making decisions*	81.4	79.7
10. *Women are better pocket holders for the family than men*	93.2	92.1
11. *Women do not need to participate in community development*	37.0	36.1
12. *Women are more suitable for housework than community development work*	72.8	73.1
13. *Fetching water should be the men's job*	41.5	34.8
14. *Men support women's participation in community development work*	73.0	80.2
15. *We would like to see women's participation in water and sanitation activities*	92.1	97.4

Table 4.6 *Men's attitude towards women's participation in community development (C.D.) work*

The meaning of women's participation in C.D.	scale					
	5	4	3	2	1	
Success	45.3	38.7	12.0	2.2	1.8	Failure
Active	37.4	32.2	17.2	9.3	4.0	Passive
Smooth	34.8	36.6	14.5	9.7	4.4	Rough
Reasonable	34.2	35.1	21.3	7.6	1.8	Unreasonable
Fast	41.9	29.5	16.3	9.7	2.6	Slow
Appropriate	38.3	31.3	16.7	11.0	2.6	Inappropriate
Good	49.8	30.0	11.9	6.6	1.8	Bad
Accurate	37.4	37.0	18.9	5.7	0.9	Inaccurate

Table 4.7 Men's attitude towards women's decision-making in community development (C.D.) work

The meaning of women's participation in C.D.	scale 5	4	3	2	1	
Accurate	36.6	36.6	18.1	6.6	2.2	Inaccurate
Success	36.6	39.6	13.2	8.4	2.2	Failure
Reasonable	39.2	33.9	20.3	5.3	1.3	Unreasonable
Appropriate	35.4	35.4	21.2	7.1	0.9	Inappropriate
Fast	35.1	23.1	16.4	18.7	6.7	Slow
Smooth	34.4	29.1	22.5	10.1	4.0	Rough
Good	42.7	31.7	17.2	7.5	0.9	Bad
Active	33.2	24.3	20.8	16.8	4.9	Passive

Chapter 5

Water Supply and Latrine Development in Project Area in Collaboration with GGAT

The concept and development experiences of GGAT

The Girl Guides Association of Thailand (GGAT) under the Royal Patronage of Her Majesty the Queen is a non-governmental organization established in 1957 and adheres to the principle of the World Association for Girl Guides and Girl Scouts. The objectives of GGAT are as follows : 1) to develop good citizenship among girls so that they may enjoy happy lives and are helpful to others, 2) to promote friendship among girls within the country and abroad and, 3) to promote good relationships and understanding with associations having the same or similar objectives within this country and abroad.

In order to achieve these stated objectives, GGAT sets up training courses in accordance with the needs of various age groups. These courses have four fundamental bases, namely, training for character, health, handicrafts and for service to others. Its activities may be divided into two main categories :

1. In-school activities. The training curriculum in school for these is arranged for girls according to their ages, blue birds (7-11 years), girl guides (11-15 years) and older girl guides (16-21 years). At present there are more than 20,000 members

in 150 schools all over the country. These members are well prepared to be girl guides and to propagate the movement in communities in order that people can help themselves, their families and their communities.

2. Out-of-school activities. GGAT has been arranging various projects for out-of-school females aged 15 to 24 years in the rural and urban congested areas. However, some of their development projects have also included males and females in the communities. The main projects are as follows :

2.1 Home economics training. This program is for 14-18 years unemployed girls living in urban areas. These is a hope to help them to learn to lead a more appropriate way of life and to be able to work and support themselves. GGAT may also help them find employment.

2.2 Rural female youth development project. This program is to train rural females aged between 15 and 24 years in order that they will have the knowledge to lead a good life and be able to work to support themselves. There are three stages in their training. The first stage is to train them as a group (32 people) for 45 days right in their villages. For the second stage, the girls with good potential and interest will be selected for further training for another six months to one year. This training is in their area of interest, e.g., in handicraft training at the GGAT northern center in Chiengmai, agricultural training at the GGAT northeastern center in Surin, etc.

For the third stage, some of the girls who passed the second stage will be provided further training to be trainers and some will return to their villages to start vocational groups with their friends in the villages. Such groups will learn dressmaking, weaving, agriculture, etc.. The vocational groups in the villages will be supervised by the GGAT trainers for a period of time. At the current time there are more than 2,000 girls in 60 villages in 15 provinces who have gone through this program.

2.3 Pre-school child development project.

GGAT has been supporting the establishment of pre-school child care centers in various rural villages. The female youth who have gone through the rural youth development project will be selected and provided with further training in home-health care and child care as well as in duties and responsibilities such as child care-takers. They then will be in charge of these centers.

2.4 Long-term agricultural training project.

There are two main projects, namely, 1) agricultural development training at Ban Tasawang in Surin Province which experiments in soil improvement methods for all season agriculture. Their activities include construction of water supply systems, trying new methods for planting, growing different plants in different seasons, making manure, etc.. After three years of successful work, the place became the study site for nearby village leaders, farmers and government officials. Some male and female youths who show an

interest in agriculture will be selected for the training and living at the center. After they gain enough experience they will go back to develop their own land in the villages. 2) The fresh water fish raising project in Prasart district in Surin Province is both a training center and a distributing center for young fish to the villagers.

The above-mentioned activities and achievements show that the GGAT has a long record of experiences in rural village development even though only the training of female youths were emplasized at the beginning. Later, it was obvious that it would be too difficult and too much to expect the trained female youth alone to help their families economically. The scope of activities of GGAT was then expanded to assist all villagers especially in the area of agriculture.

At the present time, GGAT has centers in every region of the country, namely, the northern center in Chiengmai, the northeastern center in Surin, the eastern center in Prachinburi, the southern center in Pattani and the headquarter in Bangkok.

Development plan and GGAT's program in the project area

GGAT does not have a clear written plan and program for the project area so information presented in this section is obtained through interviews with GGAT staff, the analysis of their activities and meeting reports on various occasions. This information may be summarized as follows :

1. The concepts for project implementation by GGAT in the project area follow the long term experiences of the association in carrying out other development activities. The two main aspects are as follows :

1.1 The training of females in various age groups to help them develop skills and attributes in four areas, i.e., character, health, handicrafts and service to others. The water supply component and sanitation are added into the training for this project.

1.2 The promotion and support for village development for better living of the villagers through community participation. This can also include water supply and sanitation.

2. Implementation strategies include the following steps :

2.1 Before the project starts. Inform various concerned agencies in the provinces as well as ask for permission and cooperation to implement the project in designated areas. Close collaboration and coordination among concerned agencies and GGAT were obtained throughout the project implementation.

2.2 GGAT staff working on the project may be divided into two categories :

2.2.1 Permanent field workers. There are six field workers and one coordinator (during the first year there were two coordinators but one resigned to get married so there was only one left during the second year) working as a team in the villages. These workers were specially trained to work on this project. Three out of the six field workers were females (two were newly recruited for the project with bachelor degrees in economics and education and the other one was an experienced girl guide member with compulsory education) and all are natives of Surin and Srisaket provinces and had a good knowledge of local dialects. The other three field workers were males. Two graduated from the agricultural training project of GGAT and were further trained in Agriculture in Japan for 15 months. The other was a Japanese volunteer with a degree in agriculture.

The coordinater was the GGAT member who has been working for GGAT for a longtime and was very keen on advancing rural development according to the GGAT concept. She acted as the team leader and is a liaison person between the field workers and the project director.

The two female field workers for this project were newly recruited from a pool of 17 applicants who participated in a one-week workshop covering the GGAT concept and implementation strategies, primary health care, water supply and sanitation, problem identification, planning and teamwork at the GGAT headquarter.

2.2.2 Supporting staff. A number of experienced members of GGAT assisted the field workers on various activities as needed and appropriate. For example they assisted during meetings and training sessions arranged for villagers and in community preparation. In addition, other GGAT staff at the northeastern center also assisted in training occasionally, i.e., training on fish raising.

2.3 Implementation of work by GGAT

2.3.1 Two of the staff (one GGAT female field worker and one male agricultural worker) were sent to live and work in each of the three villages (Villages 1, 2 and 3) for a period of time. After the work in the first three villages had progressed to a point where periodic visits only would be

sufficient to run the work, the field workers moved to start working in the other three target villages.

2.3.2 Implementation methods of GGAT may be summarized as follows :

2.3.2.1 When the field workers first went into the villages, they spent their time getting acquainted with the people. Then, after that, training for the promotion of women as health care providers of family and community, was arranged for all females in the village. After the training, there was a two-day seminar for the villagers to discuss together the problems of their community and the solutions. GGAT offered material assistance as appropriate if what was needed was more than what the villagers could handle themselves. The villagers could contribute labor for construction and some money where possible. Water supplies and latrines came up as problems for all villages.

2.3.2.2 During the implementation period in the villages, other GGAT village-based training activities such as the rural female youth program, were offered to the villagers. Initiation and participation of women in water supplies and sanitation development were again emphasized.

2.3.2.3 Other development activities were also promoted according to need and the problems of the villages

especially in the areas of agriculture and fisheries. These are of interest to many villagers and are a GGAT specialty.

2.3.2.4 If support and assistance were needed from governmental organizations, GGAT staff would do the contacting as well as the encouraging of the villagers to learn how to do it themselves so that they would be able to do it themselves after GGAT had left.

2.4 A part of the plan in the project area of GGAT after six months of implementation is presented in Table 5.1 GGAT draw up this plan from the results of a seminar which included representatives from governmental organizations, village leaders, and village women.

Table 5.1 Example of GGAT implementation plan in the project area

Goal	Strategy	Activity
1. Villagers of six villages have adequate water supply for drinking and domestic use.	- improve the existing water supply sources - construct new water supply sources for villages with problem - improve water storage containers	- improve 18 water supply sources - construct three new water supply sources - at least 100 households participate in making jar covers and gutters.
2. Fifty percent of households have sanitary latrine	- loans are provided as necessary for villagers to buy materials for latrine construction	- 236 households construct latrines for their families

Table 5.1 (Continued)

Goal	Strategy	Activity
3. *Villagers are more aware and have better understanding of their roles as health care providers*	- *more knowledge on development, health care, and cleanliness practices, is provided*	- *at least 200 households make manure and grow vegetables around their houses or by the water supply source* - *promotion of agricultural activities such as fish raising, vegetable gardening, planting trees, setting up village funds (e.g., fertilizer fund)*

Development activities and implementation process

1. The development activities in the project area for a period of over a year and some results are presented in Table 5.2.

Table 5.2 Development activities of GGAT in project area by village

Activities	*Village*					
	1	*2*	*3*	*4*	*5*	*6*
Training						
1. Promotion of women as health care providers for family and community	✓	✓	✓	✓	✓	✓
2. Vocational training for young women	✓	✓	✓	✓	✓	✓
3. Girl guide training	✓	✓	✓	✓	✓	✓
4. Youth camping	✓	✓	✓	✓	✓	✓

Table 5.2 (Continued)

Activities	village					
	1	2	3	4	5	6
Water and latrines						
5. Dug well construction (N)	2	1	-	-	-	2
6. Dug well improvement* (N)	1	-	-	-	3	5
7. Handpump deep well construction (N)	-	1	-	-	-	1
8. Pond improvement (N)	-	-	2	-	-	-
9. Making jar covers	✓	-	✓	-	-	-
10. Latrine construction (N)	39	28	33	38	45	44
11. Boiling water	/	✓	✓	✓	✓	✓
Campaign after training						
12. Road development	-	-	✓	-	✓	-
13. Cleanliness of household and road	✓	✓	✓	✓	✓	✓
14. Soy bean milk	-	✓	-	-	-	-

Table 5.2 (Continued)

Activities	Village					
	1	2	3	4	5	6
Others						
15. Buying government fertilizer for villagers	✓	-	-	-	-	-
16. Training on fish raising	✓	✓	✓	✓	✓	✓
17. Vegetable gardening around pond	-	-	✓	-	-	-
18. Making manure	✓	✓	✓	-	-	-
19. Mushroom growing	✓	-	-	-	-	-
20. Raising fish in ponds	-	-	✓	-	-	✓
21. Distribution of bean seeds	-	-	-	-	-	✓
22. Health education movies	✓	✓	✓	✓	✓	✓

*include construction of platform, provision of common bucket and pulley.

Table 5.2 indicates that GGAT has arranged various training activities as well as the promotion of various vocations for women and villagers in every village. In addition, there are also campaigns such as for cleanliness of households and village roads after the training. There are also contests arranged and rewards provided for winners. However, vocational activities, like making manure, mushroom growing and distributing of bean seeds were only arranged in some of the interested villages because GGAT has limited manpower. Fish raising, however, was offered to all villages because GGAT now has all the necessary facilities and manpower at their training center and there is a high level of interest from the villagers.

The construction and improvement of water supply sources differ from village to village depending on the problems and needs of the people. It is to be noted here that at the time of the post-project survey, there had not been any water source improvement or construction done in Village 4 because the villagers from this village expressed more interest in getting a weir for agricultural purposes than getting anything else. However, weir construction costs are beyond the management abilities of GGAT.

2. The process of implemention concerning water supplies and sanitation differs in each of the villages. The details of the process in each village are presented below.

2.1 Water supply

Village 1 After the training, the village leaders together with the villagers dug a new well. This action took place before material assistance from GGAT came. The villagers all together offered labor for the digging and contributed approximately 500 baht in cash. However, the material costs to do the casing and the platform for the well was estimated to be 17,000 baht. This amount was provided by the GGAT. Technical assistance came from the Sanitary Division, Surin Provincial Health Office. With this very impressive participation of the villagers, a second new well was later constructed to further assist with the water shortage problem of the village. Material assistance for this also came from the GGAT.

For the old well, the villagers worked together to improve by making a new platform, heightening the old casing, installing a pulley, providing a common bucket for water drawing and enlarging the path to the well. The material cost also came from the GGAT. After a period of use, the villagers discovered that pulling the rope of the pulley to draw water was not easy on their hands. Many people did not like this arrangement so they took the pulley down and replaced it with a bamboo lever The bamboo lever with a common bucket tied at its end to draw water, is still in use. The improvement and construction of dug wells seems to have eased the water supply shortage problem of this village considerably.

Village 2 This village has a very severe water supply shortage problem for both drinking and domestic use water. The people are willing to cooperate to work to ease the problem. More dug wells were dug but in vain since there was too little ground water to use. No further improvements to the newly dug well were therefore made. The villagers also tried to dig more dug wells elsewhere but the results were the same. Drinking water shortage problems were not solved. During the data collection period in the dry season. Villagers have to wait for very long times during the day and all night at nights to get drinking water.

For domestic use water, villagers would like to have a handpump deep well so GGAT contacted the Mineral Resources Department for assistance. One hand pump deep well was drilled and the people are happy with the water yield even though there may be a queue to get the water. It is the only source in the village for domestic use water. (Domestic use water was obtained from a nearby village in the past). During construction, each household contributed five baht towards the food for workers during the construction.

Village 3 All villagers in this village are interested in improving the two existing ponds as sources of drinking, domestic and agricultural water. GGAT contacted the Mobile Development Unit of the Military for assistance with a machine and equipment

to do the job. The first pond was enlarged and improved. The villagers provided food and drink for the workers as well as whatever labor the job required. After the improvement, the water was found to be too turbid to be used for any purpose except agriculture. Therefore, this pond is providing water for vegetable gardening around the pond. For the second pond, the Rural Accelerated Development Office was contacted to provide assistance to improve the quality of water. This pond is also a source of drinking water especially in the dry season. A small filtration well was constructed next to the large pond. The filtration media is placed between the pond and the filtration well. At the time of data collection, the filtration was not usable due to the drying up of the pond. People still have to get water from neighboring village for use.

Village 4 This is the only one village in the project area which has had no water development activity untill the time of the data collection. The level of water shortage problem here had not so severe. At the beginning, people expressed interest in improving water quality but later changed their mind to requesting a weir for agricultural purposes. GGAT contacted the Irrigaiton Department for assistance but they were told to wait because this village is not a top priority according to their plan. Village 4 is also the only village that GGAT workers were not stationed in.

Village 5 There are three famous dug wells here that people have commonly used and which have adequate amounts of water all the year round. The villagers therefore proposed to have these wells in place and improve them by making platforms and installing pulleys with common bucket for drawing water. The design was made by the craftsman of the village and the villagers cooperated to construct them. The material costs were met by GGAT. However, after a period of use, the common bucket was worn out and no replacement was made. The people then went back to their old ways of drawing water which utilized individual buckets.

Village 6 The houses in Village 6 are located in three clusters, therefore, there was an attempt to have the development activities cover each of these groups. The water development activities in this village include the improvement of five dug wells, the construction of two dug wells, and the drilling of a hand-pump deep well. The five dug wells improved were improved in the same way as in other villages. The common buckets were also worn out quickly after a period of use and were not replaceed. The villagers went back to their own way of using individual buckets to draw water. The digging of two new dug wells (7.5 and 12.5 meters in depth) was assisted by the Internal Security Unit of the Military. The new handpump deep well was drilled by the Mineral Resources Department as it was done in Village 2.

(The newly constructed handpump deep well is being used by a majority of the people in the village unlike the old handpump deep well that was not utilized at all because of the high iron content in the water.) People participation in the construction of the new wells was minimal since the work was done by a machine. The villagers only provide food and drinks for the workers.

In short, it may be said that all the water supply improvement in all villages was done according to the expressed need of the people. With the support of materials from GGAT and the assistance from related government agencies. The result was that four villagers, namely, villages 1, 2, 3, and 6 have been helped to a certain extent concerning water supply. Village 5 had no shortage problem so work was focused on water quality improvement. This attempt was not very successful since people's proper water drawing behavior only lasted for a short period of time. Village 4 had not implemented any activities at the time of the second survey since their request was for agricultural water supply which is more than what the GGAT can handle. An outcome cannot be assessed at the current time.

2.2 Latrines

The campaign for latrine construction was the same in every village. After training GGAT workers remind the villagers constantly of what was needed The necessary materials to construct

latrine (latrine slab, casing and floor) were supplied by GGAT. People however, have to pay back the costs of these materials in stallments. The superstructures of the latrines are the responsibilities of each household. The money paid back by the villagers will be added to the village development fund to support other families in the future.

Chapter 6

Impact of the Project

In this chapter, the impact of the project on promotion of women's participation in water supply and sanitation by the GGAT will be presented under three headlines as follows :

1. *Impact on water supply*
2. *Impact on latrines*
3. *Communitys' and women's participation in development activities*

1. Impact on water supply

1.1 Quantity

The changes on quantity of water supply sources as well as the convenience and shortage problem will be presented.

1.1.1 Change in number of water supply sources. *In the six villages under study, there are five more dug wells constructed, nine dug wells improved, two ponds improved and two handpump deep wells drilled (Table 6.1). The type of water supply differs among villages according to the needs and problems of each village. All the sources provided coincided with the expressed needs of the villagers.*

Table 6.1 Number of water supply sources constructed or improved by village

Water supply source (N)	Village					
	1	2	3	4	5	6
Dug well constructed	2	1	-	-	-	2
Dug well improvement	1	-	-	-	3	5
Pond improvement	-	-	2	-	-	-
Hand pump deep well constructed	-	1	-	-	-	1

In addition to the public water supply sources that have been improved or constructed as mentioned above, there have also been increases in numbers of water storage containers available. About 13.0 percent or 54 households brought more medium sized jars (ceramic or clay jars, capacity 240 liters or less) to store drinking water and 14.7 percent or 64 households acquired more big cement jars (capacity 1,000-2,000 liters) through the Rural Job Creation Project (RJCP). On the average, the increase in drinking water containers is one jar per family. There are a few households with an increase of two jars or more during the past year. (six households have three more jars and two households have four more jars). For domestic use water containers, the increases are less than those for drinking water containers. There are only 33 households with more domestic

use water containers (25 households brought more ceramic jars and eight households acquired more big cement jars through (RJCP) (Table 6.2). The reason for the increase water containers, is that the existing ones had not enough capacity for use.

Table 6.2 The increase in water containers during the past year by village

Type of container increased	Village						Total
	1	2	3	4	5	6	
Drinking water containes							
No increase	56.4	52.0	35.3	79.0	92.4	85.3	72.2
Increase in ceramic jar	43.6	4.0	7.8	18.0	5.1	9.5	13.1
Increase in big cement jar	-	44.0	56.9	3.0	2.5	5.3	14.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	79	95	414
Domestic use water containers							
No increase	84.6	90.0	90.2	91.0	91.1	98.9	92.0
Increase in ceramic jars	15.4	6.0	3.9	6.0	8.9	1.1	6.0
Increase in big cement jars	-	4.0	5.9	3.0	-	-	1.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	79	95	414

1.1.2 The adequacy and convenience of water supplies

From the interviews with all the households in the project area on the water shortage problem after more than a year of project implementation, we found that 71.5 percent still think that their households have a drinking water shortage problem. More people from Villages 2, 3, 6 think that the problem is worse than the previous year. The reasons for such an answer could have been because the drinking water well in Village 2 yielded a very small amount of water. Also there were no extra drinking water sources added to Villages 3 and 6. Additionally, this year (1986) had an unusual drought problem. (Statistics on rainfall from the Weather Bureau during the period November 1985 - April 1986 for Surin province show that 27.9 ml. fell whereas for the period November 1986 - April 1987 rainfall was 12.2 ml. There was no record for Srisaket province since there is no weather station there).

For the domestic use water shortage problem, the situation this year is much better than last year. The percentage of people that said that they have a shortage problem was reduced from 62.5 percent to 38.9 percent, especially in Villages 2 and 6. Village 6 has received one handpump deep well and two deep dug wells (7.5 and 12.5 meters in depth) and Village 2 has added one handpump deep well to their supply sources. Village 3 said they had a worse problem this year than last year. This may be because an improved pond became unusable for domestic use water because

of its turbidity. (The turbidity was too much to filter through filtration paper even though the water was diluted three times).

The best way to solve drinking water shortage problems according to a majority of those with the problem, is to fetch water from elsewhere or wait for water (61.7 percent). There are only 18.1 percent of the people who think about finding a source or 15.2 percent who think about storing water for the dry season. All of these responses reflect the potential difficulty is changing the sources of drinking water for the people, they are really sticking to their traditional sources (dug well water) even though there is a shortage problem. Such a finding can be expected given the responses about the type of water used for drinking again this year ; the same as the previous year even though there have been new water sources developed. One observation to be made here is that more big cement jars are in existence in the villages. These were not used as extensively during the previous year. The rain water in these jars was used for multi-purpose use (not only for drinking) so that after the rainy season was gone the water in the jar was also gone. The new cement jars acquired during the past year have not been put into use yet because the people said they are too new to be used.

The best ways to solve domestic use water shortage problems, according to the respondents, are similar to those solutions for drinking water supplies. A majority of the

people think that waiting for water or fetching water elsewhere is the best solution. Only a small percentage of people think of constructing new sources as solution.

Regarding the current convenience of fetching drinking water a majority of the respondents said it is the same as it was last year. Only 13.7 percent said it is more convenient this year (most of the answers came from the people in Village 1 and some from Villages 5 and 6) because of the improvements of the paths to the wells and the installment of pulleys and bamboo levers. For the convenience of fetching domestic use water, a majority said it is the same as last year. About one-fourth of the people said it is more convenient this year. These persons are mainly from Villages 2, 1 and 6. People in Village 2 no longer need to travel to the nearby village to get domestic use water since they have their own handpump deep well now. However, as a whole, three fifths of the households still have the problem of waiting for both drinking and domestic use water (Table 6.4).

Table 6.3 Feelings about the water shortage problem by village during pre and post project surveys

Water Shortage Problem	Village 1		2		3		4		5		6		Total	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Drinking water														
No problem	20.5	28.2	5.1	-	3.3	2.0	26.9	32.7	72.0	83.5	12.0	7.4	25.6	28.5
Have shortage problem	79.5	71.8	94.9	100.0	96.2	98.0	73.1	67.3	78.0	16.5	88.0	92.6	74.4	71.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	39	59	50	53	51	108	98	82	79	100	94	441	411
Domestic use water														
No problem	28.2	33.9	16.9	58.0	13.2	2.0	34.6	55.6	68.3	81.8	44.0	93.7	37.5	61.1
Have shortage problem	71.8	66.1	83.1	42.0	86.8	98.0	65.4	44.4	31.7	18.2	56.0	6.3	62.5	38.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	39	59	50	53	51	108	98	82	79	100	94	441	411

Table 6.4 Best-solutions for water shortage problems, the waiting problem for water and the convenience in fetching water by village

Description	Village						Total
	1	2	3	4	5	6	
Best solution for drinking water shortage problem (for those with problems)							
Increase water supply sources	33.3	36.2	16.0	22.7	15.4	1.2	18.1
Waiting for water	29.2	38.3	36.0	45.5	30.8	17.1	30.5
Fetch water from elsewhere	8.3	-	40.0	7.6	30.8	69.5	31.2
Storing water for dry season	25.0	14.9	14.0	15.2	23.1	12.2	15.2
Other	4.2	10.6	4.0	9.1	-	-	5.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	24	47	50	66	13	82	282
Best solution for domestic use water shortage problem (for those with problems)							
Increase water supply sources	8.3	11.8	21.7	22.5	13.3	-	16.9
Waiting for water	25.0	35.5	15.2	50.0	26.6	-	21.1
Fetch water from elsewhere	41.7	29.4	30.4	12.5	33.3	66.7	29.1
Storing water for dry season	25.0	11.8	19.6	7.5	20.0	33.3	16.9

Table 6.4 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Other	-	11.8	13.0	7.5	6.7	-	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	24	17	46	40	15	6	148
Convenience in fetching drinking water							
Same as last year	23.1	68.0	27.5	75.0	77.2	60.0	60.4
More convenient than last year	46.1	2.0	4.0	10.0	18.9	13.7	13.7
Less convenient than last year	30.8	30.0	72.6	15.0	3.8	26.4	25.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	79	95	414
Convenience in fetching domestic use water							
Same as last year	30.8	10.0	56.0	78.0	79.5	68.4	60.7
More convenient than last year	43.6	90.0	2.0	10.0	19.3	13.6	28.7
Less convenient than last year	25.6	-	42.0	12.0	1.3	-	10.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	50	100	78	95	412

Table 6.4 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Waiting problem for drinking water							
No problem	23.7	-	19.6	38.0	89.9	55.8	43.8
Same problem as last year	2.6	32.0	17.6	10.0	1.3	15.8	12.6
More problem than last year	44.7	66.0	62.7	31.0	5.1	14.7	31.7
Less problem than last year	28.9	2.0	-	21.0	3.8	13.7	11.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	50	51	100	79	95	413
Waiting problem for domestic use water							
No problem	30.8	51.0	52.9	63.0	89.7	96.8	40.1
Same problem as last year	2.6	2.0	13.7	7.0	1.3	-	4.1
More problem than last year	38.5	4.1	23.5	19.0	3.8	1.1	12.6
Less problem than last year	28.2	42.9	9.8	11.0	5.1	2.1	13.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	49	51	100	78	95	412

1.2 Quality

Before the project started, 56 samples of water from various drinking and domestic use water sources of six villages were collected for laboratory testing. After over a year of project implementation, samples from the same sources were collected and tested again (only 44 samples from old sources were available because sources for the rest were dry). Fourteen samples were from new sources. The results of the tests show that a majority of the water supply sources have higher coliform bacteria than is standard for normal drinking water. The quality of water for all village except for Village 1 has not been changed by the project implementation (Table 6.5).

Table 6.5 Bacteriological test of water quality before and after the implementation by village

Water quality	Village												Total	
	1		2		3		4		5		6			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Port
Meet standard*	5	8	8	2	5	1	4	3	6	0	5	4	33	18
Do not meet standard	5	4	3	6	3	6	5	7	5	11	2	6	23	40

*The standard used is the WHO guidelines for drinking water quality Vol.1 - Vol.2 1984. The maximum allowance for coliform bacteria is 4 colonies/100 ml. using the membrane filter technique.

Factors related to quality of water have also been investigated. Almost all the households in the project area are still using dug well water as drinking water. There have been only four households that have used rain water for drinking during the past year. Even though the dug wells in Villages 1, 5 and 6 were improved by putting in casings, platforms and by arranging for common buckets to draw water to keep the wells clean, the study results show that only Village 1 still has a common bucket in use. In addition almost half of the households (46 percent) in these three villages admitted that they do not always use common buckets to draw water because they are worn out, their own buckets are cleaner or it is not convenient to use the common buckets. Furthermore, about one third of the household said that they sometimes spilled water carelessly and that it flowed back into the wells.

When the respondents were asked about their opinions on the cleanliness of the water sources, 88.6 percent of those from Villages 1, 5 and 6 thought their improved dug wells were cleaner than before. They said there were rules to follow and they were provided information on how to keep the well clean. For Village 3, with their improved pond, the opinion was not clear. People there cannot use the water because of its high turbidity. But for the handpump deep wells in Villages 2 and 6 a majority of people are satisfied with the quality (Table 6.6).

Another factor related to water quality is the treatment of water before drinking. There are now 13.0 percent of the people in the project area especially those living in Village 1 who boil water before drinking. The reason given for boiling water is that they were taught to do so. However, from observation it was found that water drinking and storing behaviors have not changed at all. The boiled water is transferred from a boiling pot into a small jar or container. Whoever wants a drink will then use a common cup or dipper of the family to get the water from that jar and then place the cup or dipper on the lid. The boiled water can easily be contaminated. A sample of boiled water from boiling pot was tested and is clean but boiled water from a typical drinking jar shows bacterial contamination.

Table 6.6 Factors and behaviors related to water quality by village

Description	Village						Total
	1	2	3	4	5	6	
Type of drinking water normally used							
Rain water	-	-	2.0	-	-	3.2	1.0
Dug well water (old source)	73.7	71.4	82.4	70.0	79.7	69.5	73.8
Dug well water (new source)	26.3	28.6	15.4	30.0	20.3	27.4	25.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	49	51	100	79	95	412
Drawing water without the use of common bucket							
Never	69.2	-	-	-	44.6	54.2	54.0
Sometimes	30.8	-	-	-	55.4	45.8	46.0
Total	100.0	-	-	-	100.0	100.0	100.0
N	39	-	-	-	65	59	163
Spilling water carelessly							
Don't know	-	-	-	-	5.2	17.0	9.3
Sometimes	41.0	-	-	-	33.8	34.1	35.1
Never	59.0	-	-	-	61.0	48.9	55.6
Total	100.0	-	-	-	100.0	100.0	100.0
N	59	-	-	-	77	88	204

Table 6.6 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
New improved dug well is cleaner than old one							
Cleaner than old one	84.7	-	-	-	92.3	86.7	88.6
Same as old one	12.8	-	-	-	6.4	12.0	9.8
Dirtier than old one	2.6	-	-	-	1.3	1.3	1.6
Total	100.0	-	-	-	100.0	100.0	100.0
N	39	-	-	-	78	75	192
Improved pond is cleaner than before							
Cleaner than before	-	-	38.0	-	-	-	-
Same as before	-	-	26.0	-	-	-	-
Dirtier than before	-	-	36.0	-	-	-	-
Total	-	-	100.0	-	-	-	-
N	-	-	50	-	-	-	-
Quality of handpump deep well water							
No good, not usable	-	2.0	-	-	-	-	0.8
Okay	-	52.0	-	-	-	25.4	28.1
Good/very good	-	66.0	-	-	-	74.6	71.1
Total	-	100.0	-	-	-	100.0	100.0
N	-	50	-	-	-	71	121

Table 6.6 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Water treatment before drinking							
Nothing	21.1	81.6	86.0	99.0	93.7	97.8	86.8
Boiling	78.9	16.3	14.0	1.0	6.3	3.8	13.0
Filtering with thin cloth	-	2.0	-	-	-	-	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	41	50	100	79	92	408

For knowledge on the benefits of having adequate clean water and the effects of using unclean water, the same question as used in the pre-survey was repeated again in the post project survey. There are considerable differences in answers obtained from the two surveys. Health benefits were not mentioned before when people were asked in general about the benefits of clean water. In the post-project survey health benefits were mentioned much more (Table 6.7).

In Villages 1, 5 and 6 where common buckets were introduced, four fifths of the respondents knew that the common bucket was to be used to keep the well clean where as the other one fifth did not. More people from Village 1 knew about that purpose than people from the other two villages.

Almost 100 percent of the people in Village 3 knew about the rule to follow to keep the pond clean. They knew to keep animals away from it.

For handpump deep wells, which were constructed in Villages 2 and 6, the agreement reached was not to bathe or wash things on the platform of the well. This rule was to keep the area around the well clean. Only two thirds of the people knew about this effect while one fifth said there would be no effects from carrying on past activities around the well. The other one fifth did not know whether there would be consequences or not.

In summary, the water quality in the project villages is lower than standard. Improvement needs to be made especially to people's behaviors related to water quality. A majority of people have more knowledge on how to keep the water supply sources clean, the benefits of clean water and effects of unclean water, but their behavior is conflicts with their knowledge. A minority of people do not have knowledge on how to keep the sources clean. As these sources are public, their unsanitary practices can have an effect on the larger population in the villages.

Table 6.7 *Percieved benefits of having adequate clean water and the effects of using unclean water before and after the project by village*

Description	Village 1		2		3		4		5		6		Total	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
General benefit of clean water														
None	2.5	-	3.4	-	-	-	-	-	1.3	-	1.0	-	1.1	-
Help for cleaning, cooking, washing	32.5	15.4	13.8	20.4	13.0	21.6	11.4	18.0	12.7	25.6	15.2	23.4	15.0	21.2
Help in planting and raising animals	10.0	5.1	24.1	4.1	13.2	2.0	22.9	2.0	53.3	9.0	20.2	2.1	20.5	3.9
No GI tract disease	-	41.0	-	26.5	-	25.5	-	18.0	-	21.8	-	33.0	-	26.3
Combination of above	55.0	38.5	58.6	49.0	73.6	51.0	65.7	62.0	60.7	43.6	63.6	41.5	63.4	48.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	40	39	58	49	53	51	105	100	79	78	99	94	434	411

Table 6.7 (Continued)

Description	Village												Total	
	1		2		3		4		5		6			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Health benefit of clean water														
None	-	-	-	-	-	-	-	-	-	-	-	1.1	-	0.2
No GI tract disease	71.7	73.7	66.0	63.3	59.6	78.4	45.8	74.0	45.0	67.9	46.9	77.4	52.3	72.9
Refresh body	15.8	7.9	13.2	2.0	13.5	2.0	14.0	2.0	15.0	3.8	14.3	8.6	14.3	4.4
Combination of above	13.3	18.4	20.8	34.7	26.9	19.6	40.2	24.0	40.0	28.2	38.8	12.9	33.4	22.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	38	38	53	49	52	51	107	100	80	78	98	93	428	409

Table 6.7 (Continued)

Description	Village												Total	
	1		2		3		4		5		6			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Effect of unclean water														
None	5.0	-	1.7	4.0	-	2.0	1.9	1.0	-	-	-	1.1	1.1	1.2
Lead to GI tract disease	85.0	92.1	91.4	80.0	53.1	76.5	66.0	78.0	66.7	81.6	65.3	93.5	69.7	83.6
Lead to skin disease	-	-	-	-	-	-	-	-	-	-	-	2.2	-	0.5
Combination of above	10.0	7.9	6.9	16.0	46.9	21.6	32.0	21.0	33.3	18.4	34.7	3.2	29.1	14.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	40	38	58	50	49	51	103	100	78	76	98	93	426	408

2. Impact on latrine

2.1 Quantity

The percentage of latrine in the project area has increased from 13.0 percent to 61.1 percent. Out of this figure, 33.3 percent are those which construction is completed and the other 27.8 percent is under construction. Village 1 has a 100 percent latrine coverage now if counting those under construction. Village 2 with no latrine at all before, now about half of the households have latrine (Table 6.8).

If there is a question if this amount of latrine adequate, the answer will be no since every household should have a latrine. Majority of those household without latrine at the current time expressed interest to have latrine in the future. The reasons for those few who do not want to have latrine include no money, no need, no room to build and nobody to build. However, majority of the respondents who have no latrine now said it is necessary for every household to have latrine with the reason of convenience. There are only 2 households who gave health reason to have latrine.

Table 6.8 Latrine ownership before and after the project by village

Latrine ownership	Village												Total	
	1		2		3		4		5		6			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Yes (completed)	15.0	69.2	-	20.0	9.6	37.2	16.2	41.0	12.7	15.2	18.4	30.5	13.0	33.3
Yes (under construction)	-	30.8	-	28.0	-	27.5	-	14.0	-	45.6	-	26.3	-	27.8
No	85.0	-	100.0	52.0	90.4	35.3	87.3	45.0	87.3	39.2	81.6	43.2	87.0	38.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	40	39	59	50	52	51	111	100	79	79	98	95	439	414

2.2 Quality

All the latrine constructed are sanitary water sealed latrines constructed under the guidance and supervision of the officers from the Provincial Health Office. The wall of the super structure is made of cement block, wood, dry grass and dry rice straw and the roof is made of corrugated zinc sheet, dry grass and dry rice straw. In some household, the latrine is built in with the bathing room. All completed latrine are in use and kept clean.

More than half of the respondents know the health benefit of having latrine along with the convenience factor. It is to be noted that there was no one mentioned about not spreading disease as benefit of latrine in the pre-survey. They only thought about the convenience and safety from rain, snake and danger at night. (All households were interviewed in the pre-survey but only those who have latrine were interviewed on benefit of latrine in the post-survey).

Table 6.9 Perceived benefits of latrine before and after the project

Description	Pre	Post
No benefit	0.7	-
Prevent the spreading of disease	-	6.0
Safe from snakes and rain	20.7	2.4
Convenience	40.1	33.7
Safety and convenience	38.5	-
Safety convenience and prevent the spread of disease	-	57.8
Total	100.0	100.0
N	429	83

3. Community's and women's participation in development activities

There will be 2 main categories presented under this topic, namely, 3.1) participation in the training and 3.2) participation in the development activities.

3.1 Participation in the training

There were number of training sessions both for the women and for the community as a whole that GGAT arranged in the 6 villages. About 72.7 percent of the households had somebody, including the female respondents themselves or some other member of the household, attending the training meetings. A majority of the respondents (68.2 percent) said they remember all the topics of the training, 16.6 percent only remember some of the topics, and 15.2 percent cannot remember any topic at all. However, almost all (99.5 percent) of the respondents were aware of the activities happening in their villages after the training sessions even though they may not have known about every one of the activities. About 4.9 percent of the respondents knew about every single activity taking place in their villages, 48.7 percent only knew about the water supply, latrines and cleanliness development and 45.7 percent knew only about one of the water supply, latrine or cleanliness development activities (Table 6.10)

Table 6.10 Participation and remembrance of topics in training by village

Description	Village						Total
	1	2	3	4	5	6	
Participation in training							
Respondent	53.8	26.0	41.2	15.0	25.3	25.3	27.5
Other member of family	38.5	64.0	51.0	51.0	32.9	38.9	45.2
None	7.7	10.0	7.8	34.0	41.8	35.8	27.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	79	95	414
Remembrance of training topic							
Remember some topics	33.3	11.0	8.7	24.2	15.4	8.6	16.6
Remember all the topics	58.3	64.4	71.7	60.6	71.1	81.0	68.2
Remember nothing	8.3	24.4	19.6	15.2	13.3	10.3	15.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	36	45	46	66	45	58	296

Table 6.10 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Knowledge of activities taking place after training							
Know all activities	2.6	18.0	7.8	-	2.5	4.2	4.9
Know about water, latrine, clearliness activities	76.9	44.0	47.1	8.2	72.2	62.8	48.7
Know only water or latrine or cleanliness activities	28.5	38.0	41.2	90.8	25.3	32.9	45.7
Know others but not water, latrine or cleanliness activities	-	-	2.0	-	-	-	0.2
Know nothing	-	-	1.9	1.0	-	-	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	98	79	94	411

During the training, the women participants had the opportunity to propose a problem, identify problem, and be selected to be a representative of a group. However, the study shows that 82.7 percent of the women never made any comments throughout the training. The comments made during the meeting, therefore, were from a few participants. The women who responded to the interview said that the most important people in identifying village problems are villagers (26.3 percent), a combination of people (24.0 percent), GGAT staff (22.9 percent), village leaders (21.7 percent) and womens group (2.3 percent).

Twenty three women from all six villages said that they were selected to be women's group representatives after the training but only four of them said they would like to be representatives, five women said they did not want to be, and the rest said they had never thought about being a representative of the group before.

It is to be noted that GGAT had originally planned to set up a women's group to be the core group in implementation activities. They hoped to select women with leadership potentials but after a thorough study of the villages and their backgrounds, it was found that there had already been a food sanitation for housewives group set up in Village 1 and a women's weaving group in Villages 5 and 6.

None of these groups was active. They only had group names but not any activities. GGAT thought that would not be appropriate to try to set up a womens group yet. Therefore, only representatives of women from the training group were selected to be liaison persons between GGAT and villagers in all implementation activities. If there could be proof of potential, then a women's group could be set up at a later date.

Table 6.11 Participation during training by village

Description	Village						Total
	1	2	3	4	5	6	
Making comments during training							
Yes	21.2	26.2	14.6	14.3	21.4	10.5	17.3
No	78.8	73.8	85.4	85.7	78.6	89.5	82.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	33	42	41	63	42	57	278
Who identifies village problems							
Village leader	28.6	21.4	22.6	25.0	23.8	7.4	21.7
GGAT staff	28.6	28.6	19.4	25.0	4.8	25.9	22.9
Government worker	-	-	-	0.5	-	14.8	2.9
Women	-	-	3.2	5.0	4.8	-	2.3
General villagers	21.4	10.7	25.8	30.0	33.3	37.0	26.3
Conbination of above	21.4	39.3	29.0	12.5	33.3	14.8	24.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	28	28	31	40	21	27	175

When the effects of participation in the training on the water and sanitation related behaviors are tested by using the chi-square test, it was found that there is a statistically significant relationship at < 0.01 level between training participation and a knowledge of the sanitary way to draw water, boil water, cleanliness of the house and latrine ownership.

In short it may be concluded that a mojority of the women in the six villagers were only listeners in the training. A variety of topics were discussed during the training so the listeners could not remember what have been proposed as village problems. The ones who selected the village problems are those few people who dared to speak up. However, participation in the training does have a positive effect on water utilization behavior, latrine ownership and household cleanliness of the participants.

Table 6.12 Relationship between participation in training and water and sanitation related behaviors

Description	Participation in training					
	Respondents		Other household members		Nobody	
	N	%	N	%	N	%
Knowledge of sanitary way to fetch water						
Use common bucket	50	76.9	53	69.7	29	42.0
Keep well surroundings clean	10	15.4	6	7.9	16	23.2
Don't know	5	7.7	17	22.4	24	34.8
Total	65	100.0	76	100.0	69	100.0
$X^2 = 24.2$ $df = 4$ $P < 0.001$						
Boiling water						
Yes (regularly and occasionally)	48	42.1	53	28.3	24	21.9
No	66	57.9	134	71.7	86	78.1
Total	114	100.0	187	100.0	110	100.0
$X^2 = 20.8$ $df = 2$ $P < 0.01$						

Table 6.12 (Continued)

Description	Participation in training					
	Respondents		Other household members		Nobody	
	N	%	N	%	N	%
Keeping the house clean						
Cleanliness of house is the same as before	35	30.7	87	47.3	71	70.3
House is cleaner than before	79	69.3	97	52.7	30	29.7
Total	114	100.0	184	100.0	101	100.0
$X^2 = 33.8$	$df = 2$		$P < 0.001$			
Latrine ownership						
Have latrine (completed)	39	34.2	80	42.8	19	16.8
Have latrine (under construction)	33	28.9	43	23.0	39	34.5
No latrine	42	36.8	64	34.2	55	48.7
Total	114	100.0	187	100.0	113	100.0
$X^2 = 21.7$	$df = 4$		$P < 0.002$			

3.2 Participation in activities

There are many activities in addition to water supply and latrine development being implemented by GGAT in the project area. Examples of these activities are cleanliness of households and village surroundings campaigns, vegetable gardening, fish raising training, making manure, and the training of young women and students. The number of participants varies from activity to activity. The activities that a majority of people took action on after the training were the cleaning of households and villages. The activities that only a small number of people took action on after the training were fish raising, and the training of young women and students (Table 6.13).

3.2.1 Water supply

3.2.1.1 Participation in the construction/improvement of water resources

in the project area centered on the construction and improvement of dug wells in Villages 1, 2, 5 and 6, improvement of the pond in Village 3, construction of hand pump deep well in Villages 2 and 6, water boiling and the provision of jar covers in all six villages.

How people participated in the water related activities depends largely on what has been done. For the construction and improvement of dug wells, the participation of

a majority of the people is in the form of providing labor for digging the wells, making the casings and platforms as well as constructing the pulleys or bamboo levers for common buckets for drawing water. For the improvement of the pond, which is mainly done by machine, people helped only by touching up the edges of the pond or providing food and drink for the outside workers. The participation of people in drilling the handpump deep well was even less since it was all done by machine. The things that people could do were the construction of platforms and the feeding of drilling workers.

When the respondents were asked who play the most important roles in construction and improvement of water supply sources, 61.7 percent said it is was GGAT while only 1.7 percent said that the villagers play the most important role. When the question was specifically asked for the respondents to name the most important villager, 85.9 percent said it was the village leader, 2.3 said it was the villagers and 11.8 percent said they did not know.

The respondents were then asked about the role of women in the construction and improvement of water supply sources. About 68.5 percent said women provide labor, prepare food and drink for workers and 2.4 percent said women gave comment on how to do the work. The other 11.8 percent said women had no

role at all. However, one third of the respondents felt that women already play a great role, another one third think women's role is moderate, 17.1 percent think women's role is too little and 11.8 percent do not know what to think (Table 6.14).

From the information mentioned above, it shows that a great number of the respondents, who are women, do not realize the importance of women's role in water development. Women provide only labor in activities. However, it is fortunate that about one fifth of the respondents still think the current women's role is too little. Such responses correlate with the answers of how many women there are in the village that people accept. About half of the respondents said there is about one woman in each village that people accept while 34.6 percent said there is no women at all that people accept. Such a number is too small to form a strong leading role in anything. The most number of women, mentioned by respondents that people accept is 4.

Table 8.13 Percentage of households which participated in various GOAT development activities in project area

Activities	Know about activities but not participate							Participate in training or facilitate activities but not taking action							Participate by taking action							Total	
	Village							Village							Village								
	1	2	3	4	5	6	Total	1	2	3	4	5	6	Total	1	2	3	4	5	6	Total	Percent	N
Dug well construction	2.7	0.0	-	-	-	21.2	7.8	0.0	0.0	-	-	-	2.9	2.9	97.3	100.0	-	-	-	69.7	84.5	100.0	102
Dug well improvement	0.0	-	-	-	24.6	21.1	15.1	5.9	-	-	-	0.0	22.3	4.6	94.1	-	-	-	75.4	68.7	79.3	100.0	179
Pond improvement	-	-	16.3	-	-	-	15.6	-	-	34.9	-	-	-	35.5	-	-	46.5	-	-	-	48.8	100.0	65
Handpump deep well construction	-	31.8	-	-	-	80.0	59.0	-	29.6	-	-	-	6.7	16.8	-	38.6	-	-	-	13.3	24.8	100.0	106
Boiling water	3.1	24.5	24.1	50.0	43.6	41.7	33.6	3.1	18.9	17.2	22.0	17.9	14.6	16.2	93.8	56.8	58.6	28.0	38.5	43.8	50.2	100.0	235
Making jar covers	6.3	11.1	8.7	66.7	80.0	100.0	32.9	12.5	11.1	4.3	20.0	0.0	0.0	9.6	81.3	77.8	87.0	6.7	20.0	0.0	57.5	100.0	73
Latrine construction	0.0	13.9	17.2	36.1	29.5	31.4	25.7	0.0	27.8	6.9	15.3	16.4	8.6	13.2	100.0	58.3	75.9	48.6	54.1	60.0	61.1	100.0	296
Cleaning individual houses	2.8	0.0	0.0	11.0	8.1	12.7	6.9	2.8	0.0	0.0	3.7	8.1	7.9	4.2	94.4	100.0	100.0	85.4	83.9	79.4	88.8	100.0	331
Cleaning village surroundings	0.0	4.5	2.3	6.8	6.6	5.8	5.1	2.9	0.0	0.0	1.1	1.1	1.2	1.2	97.2	95.5	97.7	92.0	92.1	93.0	93.6	100.0	373
Vegetable gardening	6.7	33.3	36.0	20.0	34.8	56.7	33.8	40.0	16.7	4.0	12.0	8.7	6.7	12.5	46.7	50.0	60.0	68.0	56.5	36.7	52.9	100.0	136
Raising fish	11.8	30.4	22.7	58.0	58.0	78.7	53.8	70.8	48.8	38.4	28.0	36.0	148.8	32.4	17.6	21.7	40.9	14.0	6.0	6.6	13.9	100.0	233
Making manure	13.3	24.3	2.5	55.0	64.3	72.2	43.9	53.3	5.4	2.5	22.5	9.5	5.6	11.8	33.3	70.3	95.0	22.5	26.2	22.2	44.3	100.0	228
Training of young women	20.0	6.7	7.7	43.8	57.7	61.5	40.6	70.0	80.0	76.9	41.7	34.6	26.9	47.1	10.0	13.3	15.4	14.6	7.7	11.5	12.3	100.0	130
Training of students	33.3	18.2	40.0	46.7	56.3	45.7	43.3	50.0	54.5	40.0	44.4	31.3	40.0	42.5	16.7	27.3	20.0	8.9	12.5	14.3	14.2	100.0	134

Table 6.14 Person who play most important roles in the construction/ improvement of water supply sources and women's role by village (No data from Villge 4 because no activity has been implemented yet)

Description	Village					Total
	1	2	3	5	6	
Persons who play most important role in construction/improvement of water supply						
Village leader	10.8	14.3	12.5	21.5	9.8	14.1
GGAT	64.9	69.4	66.7	54.1	59.8	61.7
Villagers	5.4	4.1	-	-	1.2	1.7
Government officers	2.7	-	-	5.4	11.0	4.8
Combination of above	15.2	12.2	20.8	18.0	18.3	17.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	37	49	48	74	82	290
Persons who play most important role among village people						
Village leader	92.3	82.0	95.9	93.4	73.9	85.9
Villagers	2.6	-	2.0	1.3	4.3	2.3
Do not know	5.1	18.0	2.0	5.3	21.7	11.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	49	76	92	360

Table 6.14 (Continued)

Description	Village					Total
	1	2	3	5	6	
Role of women in the construction/ improvement of water supplies						
Providing labor	74.4	22.4	22.4	49.3	22.0	35.3
Preparing food	-	28.6	26.5	4.5	13.2	14.2
Providing labor and preparing food	23.1	20.4	34.7	13.4	12.1	19.0
Providing opinions/ comments	2.6	12.2	-	-	-	2.4
Nothing	-	8.1	10.2	11.9	19.8	11.8
Do not know	-	8.2	6.1	20.9	33.0	17.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	39	49	49	67	91	295
Women's opinions on women's role in water development activities						
High	60.5	47.6	53.5	14.3	17.9	36.4
Moderate	39.5	36.2	30.2	44.9	32.1	34.6
Low	-	14.3	7.0	34.7	23.2	17.1
Do not know	-	11.9	9.3	6.1	26.8	11.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	38	42	43	49	56	228

When the respondents were asked to state in general terms how much the water development activities have helped to ease the water shortage problems during the past year, 59.0 percent said a lot, 28.5 percent said some but not enough while the other 12.5 percent said none. Respondents from Villages 1, 2 and 5 thought that the project has helped a lot more than respondents from other villages (Table 6.15)

Table 6.15 How much did the water development activities help to ease the water shortage problem (No data from Village 4 because no activity has been implemented yet)

Description	Village					Total
	1	2	3	5	6	
Helped a great deal	74.4	82.0	26.5	76.5	41.6	59.0
Helped some but not enough	25.6	18.0	53.1	-	47.2	28.5
No help at all	-	-	20.4	23.1	11.2	12.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	49	78	89	305

3.2.1.2 Participation in the maintenance

The newly constructed or improved water supply sources in the project area are a dug well, a pond and a handpump deep well. Each of these types of supply requires a different way of maintenance by the users.

For dug well, the common bucket system was installed but about half of the respondents do not use the system regularly. A common bucket is in working in Village 1 but is worn out in Villages 5 and 6 and no replacements have been made. Therefor, a question was asked about who is responsible for the replacement of common buckets. A majority of people said the village leader for Villages 5 and 6. However, no action to replace the worn out buckets has been taken so far. In any case, every body from Villages 1 and 5 and 91.0 percent of Village 6 siad they agree with the idea of using common buckets to draw water.

Furthermore, one third of the respondents said they used to spill water all over the place near the well and it flow down into the well. Two thirds of them said they would help keep the water source clean by following village rules in using the well (Table 6.16).

From the above responses, plus observation, it may be concluded that a majority of the villagers are now aware of the how to keep water supply sources clean, know that they should use common buckets to draw water from the dug well, agree with the idea of ~~using~~ the common bucket but for some reason the behaviors for some of them are not in accord with their knowledge.

Table 6.16 Behavior related to maintenance of dug well by village

Description	Village			Total
	1	5	6	
Availability of common bucket				
No	-	6.3	18.7	10.5
Yes (in working condition)	94.9	17.7	23.1	34.4
Yes (worn out)	5.1	74.7	44.0	48.3
Do not know	-	1.3	14.3	6.7
Total	100.0	100.0	100.0	100.0
N	39	79	91	209
Utilization of common bucket				
Use common bucket regularly	69.2	44.6	54.2	54.0
Never use common bucket	30.8	65.4	45.8	46.0
Total	100.0	100.0	100.0	100.0
N	39	65	59	163
Agreement with the idea of common bucket				
Agree	100.0	100.0	91.0	96.6
Disagree	-	-	9.0	3.4
Total	100.0	100.0	100.0	100.0
N	39	73	67	179

Table 6.16 (Continued)

Description	Village			Total
	1	5	6	
Responsible person for common bucket replacement				
Do not know	5.1	14.3	29.4	18.0
Villagers	82.1	38.6	61.8	57.1
Village leader	12.8	41.4	7.4	22.0
GGAT	-	5.7	1.4	2.8
Total	100.0	100.0	100.0	100.0
N	39	70	68	177
Spilling water carelessly				
Do not know	-	5.2	17.6	9.3
Sometimes	41.0	33.8	34.1	35.1
Never	59.0	61.0	48.9	55.6
Total	100.0	100.0	100.0	100.0
N	39	77	88	204

Table 6.16 (Continued)

Description	Village			Total
	1	5	6	
Your role in keeping the dug well clean				
None	5.1	17.7	32.6	21.6
Follow the rules	79.5	72.2	51.7	64.9
Tell others to follow the rules	7.7	7.6	7.9	7.7
Follow the rules and ask others to do so	7.7	2.5	7.9	5.8
Total	100.0	100.0	100.0	100.0
N	39	79	89	207

For the improved pond in Village 3, the water there is too turbid to use for drinking or domestic use. It is used only for agricultural purposes, i.e., vegetable gardening. However, there is a rule in place to keep the pond clean. Animals are not allowed to go into the water or to go near the water. All the households said they are aware of this rule and are following such a rule. The villagers plan to draw all water in the pond out and fill it with rain water when the rainy season comes. This will solve the turbidity problem. In the meantime various indigenous methods to make the water less turbid are being tried, e.g., the growing of water hyacinth.

For the handpump deep wells in Villages 2 and 6, which are widely used by villagers (all villagers in Village 2 and half of the villagers in Village 6 are using this source), there has not been anybody appointed to look after such wells. But so far there has not been any problem during the first year of utilization. However, when the respondents were asked who is in charge of maintaining or repairing the hand pump well, three fourths of people in Village 2 said the village leader and the villagers while half of the people in Village 6 said they do not know.

3.2.1.3 Water utilization behavior

After over a year of project implementation, with new water supply sources added to villages, the villagers were asked again about their drinking and domestic use water supply sources. It was found that a majority of the people are still using their old source, which is the dug well, for drinking. Only 13.6 percent said that they changed to a new source because the old source dries up. The new sources are also dug wells at new locations. For domestic use water, three fourths of them are still using the old source. But about 92.0 percent of people in Village 2 use a new source. There is now a hand pump, deep well installed in their village (they had to use a hand pump deep well in the neighboring village before the project) (Table 6.17)

The above-mentioned information indicated that a majority of the villagers will change their drinking water source only when the old source does not have enough water. For domestic use water the change can take place much more easily depending on the convenience of fetching water. The women remain the major persons responsible for fetching water.

Another behavioral change relating to drinking water is the practice of boiling water. The women are the ones who boil water for the family. The percentage of people

boiling water increased from 1.1 percent to 13.0 percent for all villages. Village 1 has the most number of people who boil water for drinking. The change in Village 1 is from 2.5 percent to 78.9 percent. The data from the anthropological approach also confirm this change. Villagers in Village 1 even take boiling water in bottles to drink while working in the rice fields. The change in other villages is minimal (Table 6.18).

Table 6.17 Drinking and domestic use water supply source after project implementation by village

Description	Village						Total
	1	2	3	4	5	6	
Source of drinking water this year							
Same as last year	74.4	98.0	62.7	99.0	98.7	74.7	86.4
Different than last year	25.6	2.0	37.3	1.0	1.3	25.3	13.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	78	95	413
Reason for change of drinking water source							
Old source is dry	40.0	-	100.0	100.0	50.0	95.8	84.2
New source is more convenient	60.0	100.0	-	-	50.0	4.2	15.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	10	1	19	1	2	24	57
Source of domestic use water this year							
Same as last year	76.9	8.0	86.3	90.9	98.7	71.7	76.0
Different than last year	13.1	92.0	13.7	9.1	11.3	28.3	24.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	99	79	95	413

Table 6.17 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Reason for change of domestic use water source							
New source is better	12.5	6.7	-	9.1	-	23.1	11.2
New source is more convenient	87.5	93.3	100.0	90.9	100.0	76.9	88.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	8	45	7	11	1	26	98

Table 6.18 Water treatment before drinking before and after project implementation

Treatment method	Village												Total	
	1		2		3		4		5		6			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Nothing	94.5	21.1	91.4	81.6	96.2	86.0	100.0	99.0	98.7	93.7	98.0	96.8	97.3	86.8
Boiling	2.5	78.9	1.7	16.3	3.8	14.0	-	1.0	-	6.3	1.0	3.8	1.1	13.0
Filtering through thin cloth	2.5	-	6.9	2.0	-	-	-	-	1.3	-	1.0	0	1.6	.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	38	58	49	53	50	108	100	79	79	100	92	437	408

Regarding the boiling water behavior of the villagers, we found that a majority of people are not boiling water for drinking. There are 7.3 percent or 31 household who regularly boil water for drinking (nine boiled it before the project started and the other 22 started boiling it during the project implementation), 23.1 percent boil occasionally and 13.9 percent used to try to do it but no longer do. It is to be noted here that a majority of those who regularly boil water for drinking are those from Village 1.

For those who boil water for drinking regularly, 81.8 percent said they have no problem in doing so. Another 18.2 percent said they lack the fuel to boil water. For those who boil water for drinking occasionally, their reasons are ; boil only when they are sick, no time to boil it, lack of fuel to boil it,not easy to boil it, and too much trouble to boil. For those who used to boil water and said they had stopped, the following reasons were given ; because they had notime, no utensil, no fuel to boil it, too lazy to boil it, and do not see the benefit of boiling water for drinking. (Table 6.19).

Table 6.19 Water boiling behavior by village

Description	Village						Total
	1	2	3	4	5	6	
Does your family boil water for drinking now							
Boil regularly	51.3	6.0	3.9	1.0	1.3	3.2	7.3
Boil occasionally	33.3	30.0	25.5	8.0	30.8	23.7	23.1
Use to boil but not now	12.8	22.0	31.4	14.0	7.7	5.4	13.9
Never	2.6	42.0	39.2	77.0	60.3	67.7	55.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	78	93	411
Problem in boiling water regularly							
None	80.0	100.0	100.0	100.0	-	100.0	81.8
Lack of fuel	20.0	-	-	-	100.0	-	18.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	15	3	1	1	1	1	22

Table 6.19 (Continued)

Description	Village						Total
	1	2	3	4	5	6	
Reason for boiling water only occasionally							
Lack of fuel	30.8	20.0	21.4	-	20.8	4.5	16.7
Lack of time	53.8	33.3	21.4	37.5	12.5	4.5	22.9
Too lazy to boil	15.4	13.3	21.4	25.0	8.3	18.2	15.6
Boil only when sick	-	20.0	21.4	12.5	58.3	72.7	38.5
Too much trouble to boil	-	13.3	14.3	25.0	-	-	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	13	15	14	8	24	22	96
Reason for stopping the boiling after a trial							
Do not see the benefit	-	20.0	13.3	21.4	16.7	-	14.9
No time/utensil/fuel	100.0	40.0	60.0	21.4	16.7	50.0	44.4
Laziness	-	40.0	26.7	57.1	66.7	50.0	40.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	5	10	15	14	6	4	54

3.2.2 Latrines

About half of the households in the project area participated in the project by constructing latrines for their families. All the construction has been done by family members except for one household in which construction was done for them by their neighbor. The necessary materials, excluding the super-structure, came from GGAT. The role of women in latrine construction is not obvious but women are the main persons to keep latrines clean.

There are 138 completed latrines, 83 of them were newly constructed during the past year with support from GGAT. The rest are existing latrines. The families who own the 83 newly constructed latrines used to go to the field for defecation. After their latrine constructions were complete, 73.5 percent of them said they use latrine all the time for defecation, 16.7 percent said they only use latrine part of the time because they deplored, and are disgusted by the new facility and would rather defecate wherever it is convenient, and the other 9.8 percent do not defecate in the new latrines at all because they are not used to using such a facility, are afraid to fill it up and it is more convenient to go to the fields. Those who do not use latrines are usually the elderly and the children.

For urination, only 13.3 percent of the people use latrines (Table 6.20) for the reason that it is more convenient to urinate elsewhere. From observation it was found that all village women wear sarongs so it is very convenient for them to squat down inside the sarong and urinate. They can urinate very close to the house (10 meters or less away) and they beleive that urine is not dirty and it can dry up quickly.

Table 6.20 Utilization of newly constructed latrine by village

Description	Village						Total
	1	2	3	4	5	6	
For defecation							
Use every time	77.3	77.8	81.3	57.1	33.3	91.7	73.5
Use sometimes	18.3	11.1	18.7	23.9	33.3	-	16.7
Not use at all	4.5	11.1	-	19.0	33.3	8.3	9.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	22	9	16	21	3	12	83
For urination							
Use every time	13.6	22.2	6.3	14.3	33.3	8.3	13.3
Use sometimes	59.1	44.1	68.8	28.6	33.3	75.0	53.0
Not use at all	27.3	3.3	25.0	57.1	33.3	16.7	33.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	22	9	16	21	3	12	83

3.2.3 Opinions on women's participation before and after the project

Because the rural women are responsible for family matters as well as farming, their participation in community work may be viewed as something outside a women's scope. The opinion of men as well as that of the women themselves towards women's participation in community activities, may have an effect on women's participation. To reflect this picture and to study the impact of the GGAT on this opinion, the opinions of men and women before and after the project have been compared using the **t**-*test. The interesting results (Table 6.21) are as follows :*

1) The opinions of men towards women's participation in community development (C.D.) work is more positive after the project than before at a significant level of 0.000

2) There is no statistical difference between opinions of women towards women's participation in C.D. before and after the project.

3) There is no statistical difference between the opinions of men and women towards women's participation in C.D. before the project.

4) The men's opinion towards women's participation in C.D. is more positive than the women's opinion after the project. It is significant at a level of 0.007

The above-mentioned results indicate that men's opinions of women's participation in C.D. is more positive than the women's own opinions. The men's opinions is even more positive after the project's implementation. This may mean that men accept the abilities of women more since women played greater roles in C.D. with GGAT and yet still maintained their responsibilities in the households.

Table 6.21 The opinions of women and men towards women's participation in C.D.

Opinion	N	$\bar{X}$	SD	t	sig
Opinions of men before the project	177	33.94	3.70	-5.21	0.000
Opinions of men after the project		35.74	3.57		
Opinions of women before the project	390	34.46	3.61	-1.86	0.064
Opinions of women after the project		34.91	3.50		
Opinions of men before the project	201	33.97	3.68	-1.77	0.078
Opinions of women before the project		34.51	3.43		
Opinions of men after the project	183	35.71	3.59	2.73	0.007
Opinions of women after the project		34.86	3.59		

Furthermore, the opinions of men are statistically more positive, after the project than before the project (Table 6.22), i.e., they accept women's ability more, accept more, women's participation in choosing the type of water supply, accept women's opinion more, agree more that fetching water is heavy work, see more the importance of women's participation in C.D. and agree more that men support women's participation in C.D.

In short, it can be said that, the GGAT project to promote women's participation in C.D. has had an impact on men's opinions towards the acceptance of women's abilities. They also agree that women's job responsibilities are heavy.

Table 6.22 Opinions of men towards women's participation in C.D. and water supplies before and after the project

Opinion (N = 184)		$\bar{X}$	SD	t	sig
Women and men can equally participate in C.D. work	Post	2.81	0.55	2.05	0.042
	Pre	2.67	0.74		
Decisions on choosing water sources and facilities should be men's only*	Post	2.09	0.99	5.97	0.000
	Pre	1.55	0.88		
Women's opinions are acceptable	Post	2.89	0.41	3.01	0.003
	Pre	2.73	0.58		
Fetching water is not heavy work*	Post	2.16	0.98	2.79	0.006
	Pre	1.89	0.97		
Women do not need to participate in C.D. work *	Post	2.52	0.83	3.61	0.000
	Pre	2.19	0.95		
Men support women's participation in C.D. work	Post	2.78	0.59	2.19	0.030
	Pre	1.64	0.75		

*The scoring here goes in opposite direction to that for other statements. Here, agreement recieves a lower score than disagreement.

However, when the opinions of men and women on the statement "Men support women's participation in C.D. work" are compared, before and after the project, it is found that men's opinions are more positive than women's on both occasions with a significance level of ≤ 0.05 (Table 6.23)

Table 6.23 Opinions towards the statement "Men support women's participation in C.D. work" for men and women before and after the project

Opinions (N = 215)		$\bar{X}$	SD	t	sig
Before the project					
Men support women's participation in C.D. work	*men*	2.82	0.55	2.40	0.018
	women	2.67	0.72		
After the project					
Men support women's participation in C.D. work	*men*	2.78	0.60	1.97	0.050
	women	2.65	0.73		

For the women, they were asked to compare their roles before and after the project. About 78.3 of the women think that women's roles are more now important than before the project. About 75.8 percent of the women expect their roles in the future to increase in importance because they now recieve more training and they themselves are more interested, capable and united (Table 6.24).

Table 6.24 *Women's opinions on women's roles at the present time and their expectations for their future roles by village*

Description	Village						Total
	1	2	3	4	5	6	
Women's roles now compared with before the project							
Women's role is more important now	92.3	94.0	88.2	83.0	69.2	61.3	78.3
Women's role is less important now	-	-	2.0	-	-	2.2	.7
Same as before	7.7	6.0	9.8	17.0	30.8	36.6	20.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	100	78	93	411
Expectations for women's roles in the future							
Same as now	7.7	6.0	11.8	25.5	36.4	36.2	24.2
More important than now because of training	74.4	80.0	64.7	54.1	54.5	50.0	59.7
More important than now because of interest and capability	17.9	8.0	17.6	14.3	7.8	13.8	12.9
More important than now because of unity	-	6.0	5.9	6.1	1.3	-	3.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	39	50	51	98	77	94	409

The respondents also expressed their satisfaction with the GGAT project implementation in the villages for the following reasons ; the houses are cleaner now, the water supply sources are improved and there are more latrines in the villages. During the depth interviews with the women they also expressed satisfaction with the seriousness of the work of GGAT staff as well as the way GGAT got acquainted with the people (living in the village with villagers). This made people more enthusiastic to participate, i.e., there were not too many villagers attending village meetings before the project but now almost every household attends.
In addition people from Villages 2, 4 and 6 said that GGAT project activities participation created unity through youth within the villages.

Chapter 7

Conclusions and Recommendations

The conclusions from an evaluation of the promotion of women's participation in the village-based water supply and sanitation project implemented by the Girl Guides Association of Thailand (GGAT) in six villages in the northeastern region of Thailand for over a year period, may be summarized as follows :

1. The socio-economic conditions of the six villages under study is similar to other rural villages in this region. A majority of the people are poor and earn their living by yearly rice farming. They depend only on rain water for farming purposes. They settle in villages and people in them are closely related. These villagers have water supply and sanitation problems both in terms of quality and quantity. A summary of the water supply and sanitation problems before project implementation is as follows :

1.1 All the six villages have drinking and domestic use water shortage problems during the dry season. The shortage problems in villages 2 and 3 are very severe for both drinking and domestic use water. The rest of the villages have very severe drinking water shortage problems and moderate problems with domestic use water. Village 5 has the least domestic use

water shortage problems among all six villages. This is because they have one dug well which yields great quantities as well as a quick seepage of water.

1.2 All villagers in the six villages use dug well water for drinking because they are accustomed to it and love the taste of this type of water. There are only a small number of people who have large rain water storage containers such as big cement jars and tanks to keep drinking water in for the dry season. Furthermore, not all the big cement jars are used to store drinking water, e.g., in Village 1, only 33.3 percent of the jars in existence are used for keeping drinking water in, 11.4 percent use the jars for domestic use water, while the other 55.3 percent are not using the big jars at all. The most common water storage jar used in those villages is the ceramic jar (180-300 liters in capacity). On average, each household has 1.5 ceramic jars and these ceramic jars are used for domestic use water. Therefore, the people are depending on the contaminated surface water.

1.3 The drinking water source of the villagers is usually located outside the village, therefore they need to spend much time travelling to fetch water. In the dry season, when the sources yield a minimal amount of water, there are great waiting times for seepage to occur. On the average villagers spend more than an hour (including waiting time) for each trip to fetch drinking water. An exception is Village 5. For Village 2, people

have to spend the night at the well to wait for water and in Village 3 people spend the whole day travelling to get water from elsewhere.

1.4 There is much room for improvement concerning the water utilization behavior of the people. People generally do not conserve water and are not very careful about cleanliness when they use the wells. All the villagers use their own buckets, which may be contaminated, to draw water from the public well. There is no proper platform and casing for the wells. People are bathing, washing and cleaning things at the water sources. When carrying water home, there is no protection against spillage. There is also wastage of water each time it is drunk. Rinsing the cup or dipper before drinking and throwing away left-over water after drinking leads to too much water being drawn on for this purpose.

1.5 A majority of the people in the project area do not have sanitary latrines. Only 13.0 percent of the households have latrines, therefore a majority of people still go to the fields for defecation. Those who have and use latrines, use them because of the convenience factor rather than for the health benefits.

1.6 The women in the project area are generally the responsible persons for housework including providing water the for household consumption. In addition, women have to participate in the farming activities along with the men during the farming

season. However, for community development activities, a majority of women (about three fourths) have never been a member of a village group or participated in any of the village development activities. Some of those women who did participate, did so in a limited way, i.e., preparing food for the participants. Participation in community development activities is therefore dominated by men. But the opinions of a majority of both men and women are positive towards women's participation in community development activities.

2. The Girl Guides Association of Thailand (GGAT), which is a non-governmental organization, has implemented a project to promote women's participation in village-based water supplies and sanitation. The implementation strategy set up by GGAT is in accordance with the problems and needs of the people in the six project villages and may be summarized as follows :

2.1 GGAT sent two well trained field workers to live and work in each village during the initial phase to motivate people to be aware of their own community problems especially the water supply and sanitation problem. In addion, training on the promotion of women as health care providers for family and community, was arranged for women in the village. Furthermore, village meetings to identify village problems and needs as well as to arrive at solutions, were also arranged. Participants at meetings can freely propose their ideas, identify problems and solutions.

GGAT offered to help with the materials which are beyond the capability of the villagers themselves to handle. The villagers are to construct and maintain the facilities. If assistance from government agencies is needed, GGAT will provide the liaison persons to act as go-betweens the agencies and the villages.

2.2 There are also other activities, in addition to water supply and sanitation development, provided for the villages by the GGAT. These additional activities are those that GGAT has experiences in or those in which resources are included that are of interest to villagers. These activities may be divided into two categories, namely, the GGAT training of females to develop charactaristics and skills in four areas - character, health, handicrafts and services to others ; and the occupational training to enhance the quality of life of the people, e.g., through fish raising, making manure, vegetable gardening, etc., After the initial phase of getting acquianted with the villagers and after campaigns or special activities, GGAT field workers move out of the villages but still come back to visit the villages periodically (Village 4 is an exception. There has been no field worker living in the village at any point in time. There are only workers who go in periodically for various activities).

2.3 In the implementation activities, GGAT did not put an emphasis only on women and did not promote only the participation of women in water supplies and latrine development activities.

It also provided apportunities for women to participate in training and meetings. In meetings the women made proposals if they wished to do so. Their participation in all activities is dependent on the wishes of individual woman. GGAT left it open for each women to decide freely accordings to each individual's need and condition.

3. The impact of GGAT for a period of over a year may be summarized as follows :

3.1 There are more newly constructed or improved water supply sources in all villages in the project area except in Village 4. The type of wells constructed or improved depend on the problems and needs as well as on the readiness to participate by the people. These was also a consideration of what GGAT could offer. Village 5 has many dug wells with plenty of water so there has been only well improvement. The GGAT project implementation can greatly reduce domestic use water shortage problems but has not had too much impact on the drinking water shortage problem. The two main reasons for little impact on the drinking water shortage problems are namely, 1) the rainfall for the past year is much below normal so many water supply sources have dried up and 2) people use dug wells which normally yields small amounts of water, as main sources of drinking water. When there is minimal rainfall the sources dry up quicker. Village 2 is a good example of this problem.

3.2 The numbers of latrines have greatly increased in all villages. There are now more than half of the households in project area with latrines. Village 1 has 100 percent latrine coverage within the project period of little over a year. For other villages, there are more latrines being constructed.

3.3 There is little change in water quality after the project implementation. Most of the water supplies still have higher bacteria counts than is standard. Water utilization behavior is connected to the laboratory results of water quality. A majority of people are careless about contaminating water sources when they use the source, e.g., common clean buckers are not used, bathing, cleaning and washing are also still done at the water sources. Worn out buckets are not replaced except in Village 1.

3.4 The behavioral change that is related to water quality is the practice of boiling water. More than half of the households in Village 1 are boiling water for drinking since the conclusion of the project. Out of this number, more than half of them have boiled their water for a long period of time (many months). The households in other villages only boil water for drinking occasionally or during the clean water campaign period. Their reasons for not boiling water regularly include lack of time and the lack of a necessity to do so. However, people in Village 1 are still not very careful in storing and drawing boiled water for

drinking. Boiled water is easily contiminated through this careless behavior.

3.5 For women's participation in water and sanitation development activities, it was found that only a few women participated in decision-making and construction. Women were the support group to provide food and drinks for the participants as they have always been in the past. Almost none of them play leading roles in participation in water supply and sanitation.

The obvious change in women is in the area of participating in occupational training and keeping houses and community environs clean. These activities are also arranged by GGAT through cleanliness campaigns. There are no women's groups set up in any of the 6 villages.

3.6 About the opinions of men and women towards women's participation, we found the change to be very obvious. Both men and women have more positive opinions towards women's participation in all aspects of community development activities. But for a household activity like fetching water both men and women still think that it is women's business.

4. From the results of the study, there are a few points that should be considered.

4.1 Changes in the quantity of water supply sources, latrine numbers, training sessions and occupational promotion are obviously the result of GGAT work to promote cooperation and participation within communities. This may be a basis for self-reliance of the people in the future. It is truly an accomplishment of GGAT. However, whether this method of work is appropriate or replicable is debatable. There could be both a positive and a negative side to the developmental coin especially with regard to the financial (material) support from GGAT for construction and for liaison with government agencies to get assistance and support. Such things may not be in the official plan of the government. Also an acceleration of the government processes to get work done quicker in the project area is not usual. For example, the construction of hand pump deep wells for Villages 2 and 6 are outside the government plan for this fiscal year. However, GGAT managed to have them done.

4.2 People's behavior relating to water utilization has not been changed too much over a period of less than two years. This is to theoretically be expected as such a period of time is too short to expect deep behavioral alteration. Such behavior has been in place for generations. However, the focal point should be on the appropriateness of GGAT's strategy to induce change. GGAT used training and periodic campaigns to create the change of behavior in people. The question is can such methods create

a permanent change in people's behavior. Boiling water behavior in all villages faded out after the campaign except in Village 1. This phenomenon on other villages agrees with other studys' findings and theory. Why it is the exception in Village 1 should be further investigated.

4.3 Regarding the promotion of women's participation in the village-based water supply and sanitaion project, we found that in the implementation, GGAT did not try seriously to emphasize the promotion of women's participation. Rather, they left it to the community as a whole to participate. As a result, the men took a leading role in every aspect of the implementation of the water supply and sanitation development. At the same time activities relating to the households but not to water and latrine were arranged for the women by the GGAT. Therefore, it was very difficult to draw conclusions about how much women actually participated in the water supply and latrine development activities and what were the determining factors in the level and type of women's participation that occurred.

5. From the above-mentioned conclusions and considerations the following recommendations are made :

5.1 GGAT should continue to work in the project area by adapting their strategies to seriously promote women's participation in water supplies and latrine development activities.

This should be done in order that sound conclusions can be made on how and at what level the rural northeast women can participate in the water supply and latrine activities under the actual socio-cultural conditions of the area. GGAT has so far (during more than a years activities) not demonstrated clearly a strategy to promote women's participation in water and latrine development activities.

5.2 Sanitary scientists should develop an appropriate and socially accepted way to improve the physical conditions of the dug well to be more hygienic. It is the most common source of drinking water for the rural people in the Northeast. Of course, it is very difficult to change people's behavior. The present dug wells are prone to various contaminations and have recieved little attention in development.

5.3 There should be further investigations done in Village 1 to find out the determining factors for behavioral changes of the people, e.g., such as on the water boiling behavior of a great number of people and over a long period of time. Influencing factors from the outside, such as the GGAT workers, influences from individual villagers, as well as cultural and socialization processes, should be studied in order that the results may be applied elsewhere.

5.4 *There should be a continuation of development activities in the project area. The responsible government agencies could continue this work by appointing officers to work in the area or by collaborating with GGAT to continue the work.*

References

Agricultural Statistics Center, Ministry of Agriculture, National Agricultural Statistics 1985-1986.

Division of Climatology, Meteorological Department, Monthly Meteorological Register.

Girl Guides Association of Thailand, The 25th Anniversary of the Girl Guides Association of Thailand, Bangkok, 1983.

Girl Guides Association of Thailand, Home Economics Handbook, Bangkok, Tepnimitr Publishing Company.

Girl Guides Association of Thailand, GGAT Trainer Handbook, (Grades 7, 8 and 9), Bangkok, Srianant Publishing Company, 1985.

Girl Guides Association of Thailand, GGAT Curriculum for Secondary Schools, Bangkok, 1985.

Girl Guides Association of Thailand, Staff Report Form for the Promotion and Support for Women's Participation in the water and sanitation project, 1986-1987.

Department of Local Administration, Ministry of Interior, Village committee, Phamphet.

Menaruchi, A., et al., Research Report on Methodology for Community Based Sanitation Development Program Including Financial Management, Khonkaen, Banphai Hospital, 1985.

National Economic and Social Development Board, Public Health Plan According to the Sixth National Plan (1987-1991), Bangkok 1987.

Panvisavas, S. et al., Study on Quality and Quantity of Drinking Water and Consumption Behavior of Rural Thai Communities, Nakorn Pathom, Faculty of Social Sciences and Humanities, Mahidol University, 1986.

Pitakmahaket, O. and A. Suthountada, Study on Quality and Quantity of Drinking Water and Consumption Behavior of Rural Thai Communities : Qualitative Approach, IPSR. Mahidol University, 1986.

Sermsri, S. et al., Attitude, Behavior and Need for Water Supplies and Latrines in the Northeast of Thailand, Nakorn Pathom, Faculty of Social Sciences and Humanities, Mahidol University, 1982.

Tunyavanich, N. et al., Provision of Safe Drinking Water in a Rural Poverty Area of Thailand : A Case Study in Yasothon Province, Nakorn Pathom, Faculty of Social Sciences and Humanities, Mahidol University, 1985.

WHO, Minimum Evaluation Procedure for Water Supply and Sanitation Projects, ETS/83.1, CDD/OPR/83.1, 1983.

WHO, Guidelines for Drinking Water Quality, Vol.1 - Vol.2, 1984.

WHO/SEARO, Inter-country Workshops on Methodology for Case Studies of Women's Participation in Community Water Supply and Sanitation, Bangkok, 26-31 May 1985, Report prepared by WHO for UNDP (Document No.1153A).

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE