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COMPLETED PROJECT

670-37
Village Water Supply

Vol 1



The Westboro Group
Archives

1043350

R1986-027 Other #. 4

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RPO Number 670-37 - Village Water Supply - Volume 1



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WORLD BANK RESEARCH PROGRAM

COMPLETION REPORT

Date of Submission: April 10, 1974

I. PROJECT IDENTIFICATION AND APPROVAL OF REPORT

Title: Village Water Supply Project RPO No.: 670-37

Department: Public Utilities Division: Office of Director Staff Members Responsible: Warford

Date Approved^{1/} Amount (\$) Total (\$) Staff (staffmonths)
 Authorized^{2/} Disburse Prof: 3 S.S.
 \$20,000 plus part of \$21,000

Approval: joint village water supply and electrification project

J. J. Warford Division Chief (Signature) Y. Rovani Department Director (Signature)

II. PUBLICATION DETAILS, DURATION OF STUDY

Date of Contract^{3/} January 1972 Date of Completion^{4/} September 1973 Publication Date^{5/} March 15, 1974

Title of Final Report/Publication, Authors^{6/}
 Village Water Supply and Sanitation in LDC's (PI Report No. RES 2) ✓
 R. Saunders (consultant) and J. Warford

Other Publications ^{7/}

Names of Consultants/Consulting Firms/Research Institutes
 R. Saunders

NOTES: 1/ Month/year first approved by Research Committee
 2/ First authorization plus supplementary authorization
 3/ Date first contract signed
 4/ Date final disbursement made
 5/ Actual or expected publication date
 6/ Indicate publication details if relevant
 7/ Names of other publications linked to the project, e.g. symposium articles, journal articles, working papers, etc.

III. EVALUATION BY SUPERVISOR

The following aspects of the project must be covered in an evaluation by its principal supervisor, to be submitted as a part of this Form:

1. Quality of output in terms of its expected pay-off to intended users, both inside and outside the Bank, and the appropriate form of its distribution and dissemination.
 2. The identification of further research problems that the project brings out.
 3. Consistency of the output with the terms of reference to the consultants and with the approved work program of the study as a whole.
 4. Implementation factors:
 - staff input, supervision and execution;
 - nature and extent of collaboration with outside research institutes, and problems encountered, if any;
 - quality of consultants.
-
1. The objective of the study was to survey the literature and experience in the field of rural water supply in order to summarize the factors that are relevant in determining the success or failure of rural water supply programs. Dissemination has been in the form of a research paper issued mainly for water supply staff in the Bank but also for those outside the Bank who are active in this field.
 2. The major area of potential research is probably in measurement of the benefits - particularly health - of water supply projects.
 3. The study was completed as designed.
 4. Staff input about 3-man months, including field surveys.
 5. Consultant was a U.S. academic economist. The work was of high quality and no problems were encountered.

OFFICE MEMORANDUM

WHITE

TO: Mr. Yves Rovani, Director PBP

FROM: D. C. Rao *DR*

SUBJECT: Completion Reports for Research Projects

DATE: April 8, 1974

1. The following research projects in your Department were not authorized to spend any money in FY74 and, I presume, have been completed. Could you please arrange for the project supervisor to fill out the attached completion reports and return them to me by May 6.
2. If the work on any of these projects is not yet completed, please include a brief Status Report in the quarterly submission that is due by April 15.
3. Quarterly Status Reports should continue to be submitted until these projects are completed, when a Completion Report should be completely completed.

RPO Projects:

Property Values and Water Supply Benefits (RPO-236)
Village Water Supply (RPO-237) ✓

cc: Mr. Ernest Stern
Mrs. Mona Hazzah

DCRao/wg

RPO-237
Abstract of the
final paper for
the project.

VILLAGE WATER SUPPLY AND SANITATION
IN
LESS DEVELOPED COUNTRIES

A B S T R A C T

The major difficulties in village water supply and sanitation programs are not technical, but rather administrative and financial. The problems are in large part due to the relative poverty of rural communities; their failure to appreciate and make proper use of potable water; the relatively high cost per consumer of village supplies as compared with urban supplies, the encumbered administration stemming from geographical dispersion; and, undoubtedly most important, the common neglect of operation and maintenance due to the lack of proper allocation of budgetary resources, the lack of ongoing technical assistance, and the lack of administrative attention. This paper, which consists of a review of the current state of knowledge and of the experience of a number of less developed countries in the field of village water supply, concentrates on these areas, highlighting the factors which are significant in determining the likelihood of success or failure of village water supply projects or programs, and their priority in national development planning. There is also a discussion of the problem of identifying and quantifying the benefits of investment in this field.

Since the best means of dealing with many of these issues remains a matter of debate, and in view of the considerable diversity of rural communities in less developed countries, the general approach of the paper is to draw attention to possible courses of action and approaches which Bank staff should consider in appraising such projects. The paper does not pretend to outline actual policies to be followed by the Bank in controversial areas, however, the intention primarily being to make operating staff aware of opposing points of view and of various possible implications of specific actions, so that they would be in a better position to exercise judgment in any particular case. The paper is being widely circulated in order to attract comments to assist the Public Utilities Department in preparing guidelines for the appraisal of village water supply projects.

Prepared by:

Robert J. Saunders (Consultant) and
J. J. Warford

March 15, 1974

OFFICE MEMORANDUM

TO: Those Listed Below

DATE: October 31, 1973

FROM: J. J. Warford

SUBJECT: Research Proposal: Village Water Supply

You may be interested in the fate of the village water supply research proposal. A memorandum from the Research Committee is attached.

Attachment

cc: ✓ Mr. Rovani
Mr. Anderson
Mr. Berrie
Mr. Kalbermatten
Mr. Krombach
Mr. T. King
Mr. Morse
Mr. Please
Mr. Rajagopalan
Mr. Schumacher
Mr. Shipman
Mr. Thys
Mr. C. Weiss

JJWarford:pjk

OFFICE MEMORANDUM

TO: Mr. J. Warford, PBP

DATE: October 29, 1973

FROM: A. Ray, VPD *AR*SUBJECT: Research Proposal on Potable Water Supply

I regret to advise you that the Research Committee did not approve the proposed study Impact of Potable Water Supply on Village Community Development. While recognizing the importance of this topic, the Committee felt that further preparatory work is desirable, in conjunction with the Rural Development Divisions in both the Agriculture and Rural Development Department and the Development Economics Department. Any new proposal should be integrated with other work on aspects of rural development, both in the design of the research and the selection of countries.

cc: Messrs. Rovani, Yudelman, Van der Tak, Gulhati,
Avramovic, P. Smith

OFFICE MEMORANDUM

670.37

TO: Those Listed Below

FROM: J. J. Warford

SUBJECT: Proposed Research Project: Village Water Supply

DATE: August 23, 1973

We have just received the attached research proposal, and I would welcome your comments on it before deciding whether or not to submit it to the Research Committee for financing.

I would like to know if you think we should accept or reject it, or what modifications we should insist upon if accepted in principle. Please confine your comments to important issues: the details can be sorted out later. I would appreciate receiving your comments by August 31.

JJWarford:pjk

cc: Mr. Rovani
Mr. Anderson
Mr. Berrie
Mr. P. D. Henderson
Mr. Kalbermatten
Mr. Kronbach
Mr. T. King
Mr. Morse
Mr. Please
Mr. Rajagopoalan
Mr. Schumacher
✓ Mr. Shipman
Mr. Thys
Mr. C. Weiss

*Sold Jerry by phone
not a chance by this date.
GWS.*



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Cable - SEATEC BANGKOK Phone 512660, 518464

10 August 1973

Mr. J. J. Warford
International Bank for Reconstruction and Development
1818 "H" Street, N.W.
Washington, D.C.
USA

Dear Jerry:

Enclosed is our proposal on "The Impact of Potable Water Supply on Village Community Development".

This proposal has been revised and broadened to include the comments and suggestions obtained through our discussions at both Lausanne and Washington, D.C.

We trust that the proposal will be approved by the Bank because we believe that this impact study will produce information of critical value to many developing countries, the World Health Organization, and international lending agencies including the World Bank, who are concerned with evaluating the merits of sizeable investments in village water supply systems.

Respectfully submitted,

Harvey F. Ludwig

Harvey F. Ludwig

Richard J. Frankel

Richard J. Frankel

Date Received:	<i>Aug. 16, 1973</i>
Assigned to :	<i>Mr. Warford</i>
	<i>Room 3-65</i>
Action Taken :	_____
By	_____



RESEARCH PROPOSAL

ON

THE IMPACT OF POTABLE WATER SUPPLY ON VILLAGE COMMUNITY DEVELOPMENT

Submitted to: J. J. Warford
International Bank for Reconstruction and Development (IBRD)
1818 "H" Street, N.W.
Washington, D.C.

From: Southeast Asia Technology Co. Ltd. (SEATEC)
Consulting Engineers, Scientists and Planners
5th Floor, Nai Lert Building
87 Sukhumvit Road
Bangkok



ABSTRACT

The proposed project will evaluate the public health, social and economic benefits associated with a potable water supply system and assess the effects of the water system on village life, health, water use habits, economic and social growth, and organizational behavior. The project will attempt to ascertain the family income levels necessary for financial support of public taps and house connections. Using a carefully selected sample of some 10 villages, the study will address the issues of whether the water systems have (1) had a significant positive effect on water use habits and on the overall level of community health; (2) provided an impetus to other community improvement programs; (3) fostered economic growth; and (4) had a positive effect on community attitudes towards local and central government. The project will be carried out in Northeast Thailand by SEATEC, a Thai consulting firm engaged in engineering and research headquartered in Bangkok.

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INTRODUCTION

Water supply has often been cited as a key element in the economic growth of any community. The argument states that the health, social and economic benefits associated with providing a public water supply system in a community can make a significant contribution to the progress of the developing community. The argument implies also that the benefits exceed the costs. Most planners and engineers believe that the net benefits are real because community water supply projects are generally of first order priority in development programs. Nevertheless quantitative data to support the hypothesis are scarce, especially for smaller communities in rural areas. Interrelationships and social changes related to other projects and complexities in measurement have made benefit analysis exceedingly difficult. With capital funds so scarce in developing countries, it would be most beneficial to know how important the investment in public water supply is to village community development.

Village community development in Thailand generally starts with the construction of a hard surfaced road allowing the villagers to travel to a nearby district town for sale of produce and purchase of needed goods, medical care and other social services. A water supply system is next undertaken with some percentage of the capital cost coming from village contribution. The system is built to provide a year round supply, improve convenience and water quality. Thereafter, electricity is introduced into the village. The village now has the basic requirements to request the "sanitary district" status of a provincial town allowing them to receive more government benefits in exchange for some local taxation.

Development of rural water supply is thus a cornerstone in Thailand's rural development. Figure 1 shows the location of some 165 village water projects built in Northeast Thailand by the Ministry of Public Health during the period 1965-72. It is believed that these community water supply systems are necessary to foster community development and improve the well-being of the residents. It appears that in Thailand, for example, the location of a new manufacturing plant, hotel or agricultural development in or near a rural community is affected by the availability of a public water supply system. Even though the cost of water to such business activities is small compared to total investment, the decision to locate in an area may be dependent upon the community's decision to invest in public water supply. Thus, public investment in water supply may be crucial to private investment in rural Thailand.

Many questions remain unanswered pertaining to investment in rural water supply. To what extent do such investments really improve community development? What additional inputs are needed to improve village participation and acceptance? What side effects are related to such projects? What role does the type of water service provided play in affecting the benefits obtained? Is it the quantity or quality of water that affects health? Does

Health
Education

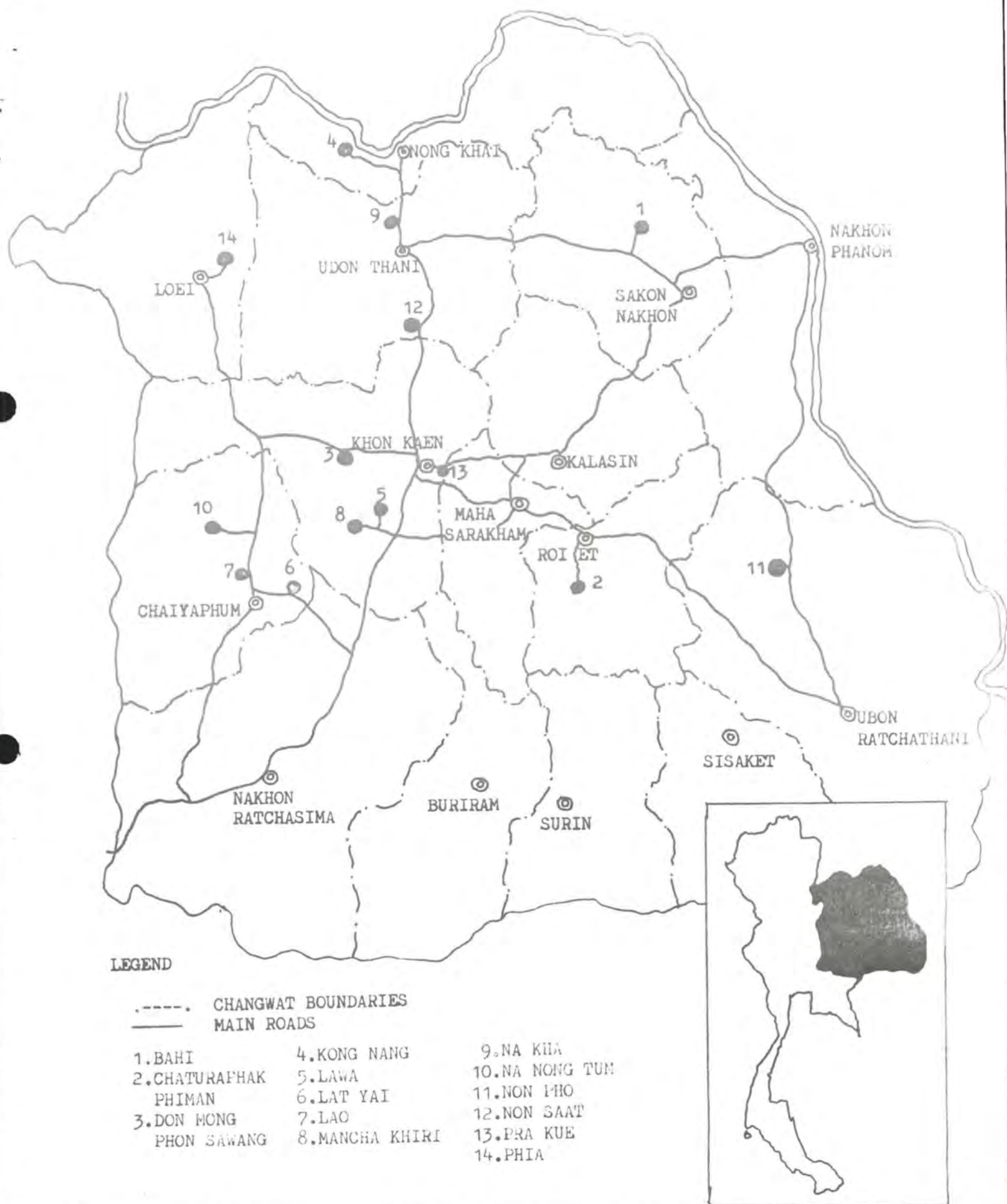


Fig. 1 - Map of Northeastern Thailand and Location of Selected Water Systems Studied



a public water system affect water consumption and water use habits of villagers or are village training programs required before long-standing customs and traditions can be modified? Is it the availability or convenience of a public water supply that inspires community participation and affects amenities? And how much do public water services relate to water based developments in agriculture and agro-industries in a rural community? Is public investment in water supply necessary to insure other forms of social overhead in community development? Is a public water supply persuasive to better educated, more able people and/or government officials to live and work in rural communities?

The nature of community development in Northeast Thailand is such that one finds isolated water projects existing for long periods of time in some villages. The absence of other community projects permits an opportunity to study the impact of these water projects on village behavior without complications from interactions with other community developments.

OBJECTIVES

The proposed project will evaluate and quantify the community benefits associated with public water supply including the effects on village life, health, water use, water habits, economic and social growth, and organizational behavior in selected villages of Northeast Thailand. The project will also determine the minimum family income levels necessary for financial support of public taps and house connections and to insure continued public participation in a community water project.

SCOPE

Using a careful selected sample of ten villages, the study will consider the observable impact of the water supply system on village characteristics and on villager attitudes. The sample will include six villages with community water projects and four similar adjacent villages but without community water projects.^{1/} Comparisons of water related habits, health and socio-economic conditions will be made among the villages based on detailed study of villager habits, living conditions and attitudes. The following criteria will be used to select similar villages for the study: (1) population; (2) location and geographic characteristics; (3) economic status; (4) water sources; (5) availability and similarity of water treatment systems; (6) type of water service provided (e.g., public fountains or individual house connections); (7) availability of electricity; and (8) ease of access to large population centers and government medical treatment facilities.

In general, the study will address the broad issues of whether the water systems have (1) had a significant positive effect on water use habits and on the overall level of community health; (2) provided an impetus to other community improvement programs; (3) fostered economic growth; and (4) had a



positive effect on community attitudes towards local and central government. Although a comprehensive evaluation will be made of the changes in behavior associated with introduction of the water system into each community, particular attention will be paid to its impact on behavior related to village health, villager water use, and villager sanitation practices. For example, specific issues to be addressed in terms of health-related villager behavior would include: (1) to what degrees do changes in eliminatory practices occur consequent to introduction of a potable water system? (2) are change made in food handling and in food preparation practices? (3) is there any change in the incidence of water related illnesses and diseases? (4) is there any change in the frequency to which villagers avail themselves of modern medical treatment facilities? (5) what specific indicators of village health conditions appear to be most appropriate for assessment of water system impact? In addition, the study will examine the degree to which government health education efforts appear to be required to achieve the desired health improvements. Hopefully the marginal utility of specifically including provision for health education in plans for water system construction can be estimated.

Economic changes associated with introduction of water system into the village will be examined in five general categories: (1) changes in animal husbandry practices; (2) changes in cultivation of cash crops; (3) other

- 1/ The six villages will be selected from some 165 village water projects currently being studied in an evaluation conducted for the Ministry of Public Health by the Asian Institute of Technology (AIT). Under the direction of Dr. Richard J. Frankel, the Environmental Engineering Division of AIT has had an active research program in community water supply since September 1969. Current research projects include "An Evaluation of the Effectiveness of Thailand's Potable Water Project in the Northeast" (financed by the Ministry of Public Health); "Pilot Plant Evaluation of A New Inexpensive Water Filter Using Local Materials for Rural Communities in Southeast Asia" (financed by the Mekong Committee, UN ECAFE); "Incidence of Diarrheal-Dysentery Diseases and Their Relationships to Water Use and Water Quality in Rural Communities of Central Thailand" (financed jointly by AIT and USAID); and several Master's Degree student theses dealing with the role of potable water in community health and planning, and design and economics of community water supply systems. Past student theses include the following: Shouvanavirakul, Paichayon (1970), "Demand for Potable Water in Small Communities of Thailand"; Athikomrangsarit, Charnvit (1971), "Benefits and Costs of Providing Potable Water to Small Communities in Thailand"; Sevilla, Alberto (1971), "A Study of Filtration Methods for Providing Inexpensive Potable Water to Small Communities"; Jaksirinont, Nongnuch (1972), "Development of A Series Filtration Water Treatment Method for Small Communities of Asia"; Low, Beng-Peow (1973), "Operational Testing of a Two-Stage Water Treatment Filter"; and Krishnaswamy, Meenakshisundaram (1973), "Household Water Supply, Hygiene and Diarrheal Diseases in Central Thai Villages".



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commercial improvements (e.g., a new store, coffee house, or a village barber); (4) changes in seasonal employment patterns; and (5) economic contributions of the villagers who were formerly employed in carrying water from the village well (housewives, children and paid water carriers). Institutional changes should relate to the manner in which the community organizes itself to finance the water system construction, select and pay the operator's salary, provide for continuing maintenance costs and allocate water to individuals and households. Of special interest is the impact of these institutional actions (specifically related to the operation of the water system) on the community's overall level of institutional and development capability, as measured by other projects undertaken by the village leadership strata.

METHODOLOGY

To measure, substantiate changes, and affirm the validity of trends associated with introduction of potable water systems requires observation over a long period of time (a 5-year period is probably a minimum time commitment for such a study). A long-term study is of course costly. It is believed that in the case of Thailand valuable impact data can be obtained by a short-term study because of the existence of previous and on-going research work in rural water supply. This proposed study will make use of all previous research work.

The main thrust of the proposed research will be a cross-sectional analysis comparing villages with and without potable water projects over a one-year period. All villages will be subjected to detailed studies through both the wet and dry seasons. The data collected will serve also as an excellent base line for verifying trends and charges accompanying public water supply investment if the World Bank is later interested, e.g., 5 years hence, in quantifying changes in the same villages over prolonged time periods.

In this study, it will be possible to obtain some time change data. In three of the 10 villages proposed for study, observation and base line data have been collected by AIT since 1969-70. In these villages it will be possible in a one-year period of analysis to obtain some change data, particularly regarding migration, water use and economic impact.

Inputs into this research will come from two AIT projects currently underway. One is an evaluation of the National Potable Water Project (under the auspices of the Ministry of Health) covering administrative, technical, and operational effectiveness of some 165 village water systems in NE Thailand. A final project report of that study will be available in August 1973. The second study, on the role of water quality in control of diarrheal - dysentery diseases in central Thai villages, is in its second year (financed jointly by USAID and AIT funds). This project will provide valuable input methodology on measurement and quantification of health benefits resulting from introduction of potable water projects in otherwise primitive villages.



Based on intensive surveys of villagers in the 10 selected villages by questioning, analysis of records and observation, this research project expects to obtain the following outputs:

1. Differences in consumption, water use, habits and sanitation of villagers in villages with and without potable water projects.
2. Differences in incidence of diarrheal-dysentery diseases, skin infections and other water related diseases in villages with and without potable projects.
3. Changes in land values, number of commercial establishments, consumer goods, number of government officials, educated and trained personnel living in villages with and without potable water projects.
4. Changes in the institutional and organization makeup of villages and in villager attitudes in villages with and without potable water projects.
5. Relationship of water rates and willingness to pay to water consumption and percent of villagers using the system.
6. Types and frequency of rural water system breakdown and their relationships to water rates and economics of operation.
7. Costs of construction and operation of rural water systems using various levels of water treatment.

From these outputs it will then be possible to achieve the following project objectives:

1. To quantify the impact of rural potable water projects on villager water use, water habits, sanitation practices, and village health.
2. To measure the effects of rural water projects on village socio-economic growth, and regional development interactions.
3. To record the changes in villager attitudes, village organization and makeup that occur as a result of putting in a rural water system.
4. To determine the need for other supplemental programs such as villager education to improve the probability of villager acceptance and support for the potable water project.
5. To determine the minimum economic level of villagers necessary to support a community potable water project.

These findings should serve as valuable guidelines in the future in evaluating the merits of proposed village water supply programs -- as to whether such projects are self-supporting, the degree of central government financing necessary, the need for rate making policies, and the effect of villager income levels on project acceptance and success.

A tentative work plan, envisioned as comprising essentially six tasks, is shown graphically in Figure 2. Figure 2 shows how the various tasks extend in time and relate to each other. It is recognized that delineation of a competent work plan, before the study is made, is very difficult but nevertheless necessary to establish the scope of the project. Assuming the project is implemented a revised and more detailed work plan will be prepared (this represents a sizeable amount of work and hence cannot be prepared prior to granting of the project). Review and concurrence in the detailed work plan would be the main item of business at the first meeting of the Project Review Board (See Project Organization).

The six tasks are described in detail in Appendix I. A summary of the manpower needs for the six tasks is shown in Table 1.

The proposed organization of the project team is shown in Figure 3.

The Project Review Board will play a key role in reviewing progress and in formulating basic policy for guiding the project operations. At the outset of the Project a detailed work plan will be prepared, including description of the various tasks to be done and the assignments for responsibility of tasks, and the first meeting of the Project Review Board will be for the purpose of reviewing and approving the work plan. Thereafter the Board will meet periodically (say every 1.5 months) for the purpose of reviewing progress and re-orienting the work plan as needed to insure maximum productivity. The reports of these meetings will serve as progress reports for the project.

Because the project entails a study of the socio-economic, political and cultural factors that influence the acceptance or rejection of the potable water project by the villages, economists and social scientists will participate throughout the Project. These personnel will include full-time staff of SEATEC supplemented by special consultants. Both National Research Council and the Applied Scientific Research Corporation of Thailand are prepared to assist in the study and provide consultant advice in the areas of village economics, behavior and community development. Several individuals in these groups are experienced in economic analysis in Thailand and in articulation of a structure and research design to assess the impact of various government programs on village life and villager behavior in Thailand, and would assist in developing impact assessment criteria, indicators of behavioral response and economic change, selection of sample villages, and interpretation of measurable changes in village life and villager behavior.

FIGURE 2.

WORK PLAN FOR PROPOSED PROJECT ON IMPACT EVALUATION OF POTABLE WATER PROGRAM IN RURAL THAILAND

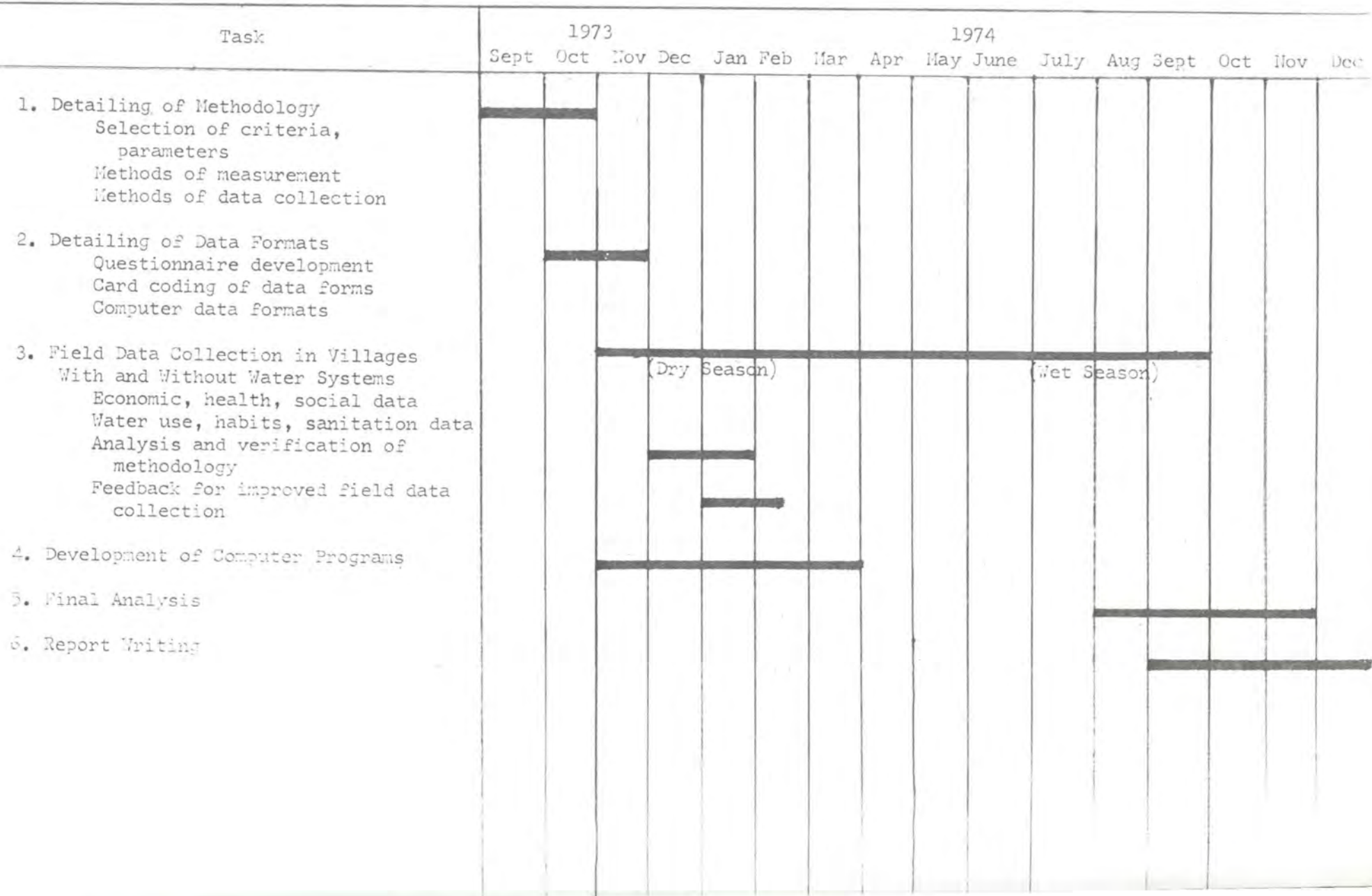


TABLE 1.

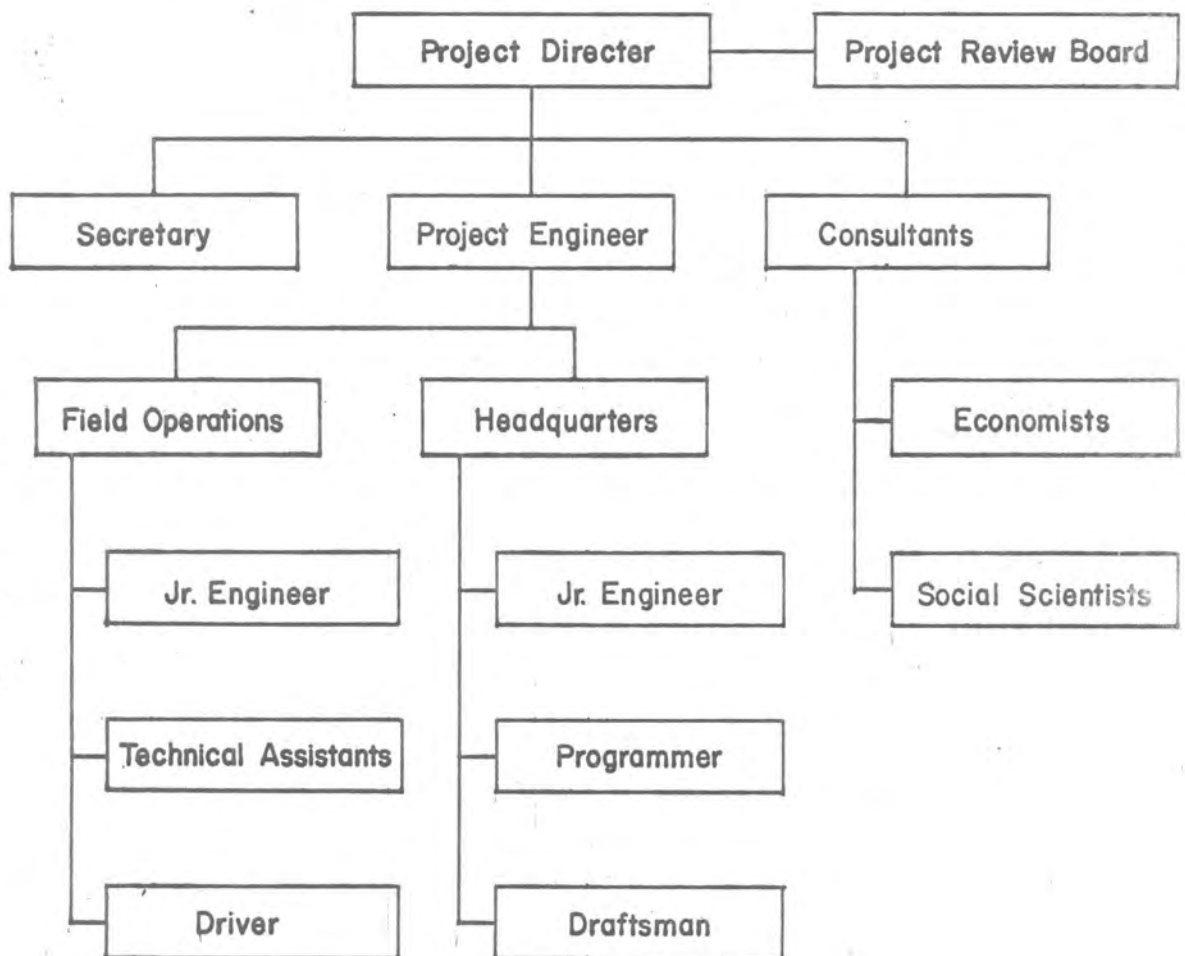
SUMMARY OF MANPOWER REQUIREMENTS FOR PROPOSED PROJECT ON IMPACT EVALUATION OF POTABLE WATER PROGRAM IN RURAL THAILAND

Task	Project Director	Manpower Requirements (man-months)								
		Project Engineer	Junior Engineer	Assistants	Economist	Social Scientist	Programmer	Secretary	Draftsman	Driver
1. Detailing of Methodology Selection of criteria, parameters Methods of measurement Methods of data collection		2	2		$\frac{1}{2}$	1				
2. Detailing of Data Formats Questionnaire development Card coding of data forms Computer data formats		1	1	2	$\frac{1}{2}$		1			
3. Field Data Collection in Villages With and Without Water Systems Economic, health, social data Water use, habits, sanitation data Analysis and verification of methodology Feedback for improved field data collection		3	9	24	$\frac{1}{2}$	1				
4. Development of Computer Programs		2	1				2			
5. Final Analysis		2	1	4	1	1				
6. Report Writing		2	1		$\frac{1}{2}$					
Totals	4	12	15	30	3	3	3	6		12

FIGURE 3.

ORGANIZATION OF PROJECT TEAM FOR WATER SUPPLY IMPACT-

ANALYSIS PROJECT





Key Staff

A listing of the key staff for the project is given in Table 2, and biographical information on these individuals is given in Appendix II.

Main offices for the project will be located in Bangkok, supplemented by a field office in Northeast Thailand, probably at Khon Kaen where the Regional Headquarters of the on-going Potable Water Project are located.

PROJECT COSTS

The total cost for the proposed project would be US\$98,350. A detailed budget breakdown, together with a suggested payment schedule, is presented in Table 3.

While some might think a project for studying impact costing about US\$100,000 is too much, may we note that the sanitary engineering literature (including WHO releases) has stressed the importance of this subject for decades, and costly programs for building village water supplies have been carried out since World War II sponsored by numerous international and national agencies costing tens of millions of dollars, all on the presumption that these investments are sound, but without any significant effort to ascertain the facts. In Thailand alone, for example, there are at least 20,000 villages needing village water supply systems, and the cost of building these, say at US\$10,000 per village, would be US\$20 million. For countries like India the costs are an order of magnitude greater.

It is recognized that getting meaningful facts through impact analysis is difficult, but considerable effort has been spent in developing methodology, identifying key parameters, and indicators of change. The proposed study is designed to utilize these fundamental studies in Thailand, one of the few countries where considerable background work on impact analysis has already been done, which therefore sets the stage for the proposed project.



TABLE 2

LISTING OF KEY STAFF FOR RURAL WATER SUPPLY IMPACT EVALUATION PROJECT

Key staff for the Project include the following:

- (1) Dr. Richard J. Frankel, who will serve as Project Director. Dr. Frankel has conducted research in the field of community water supply since 1969 and has been responsible for all reports and papers generated in this field at AIT. He is currently project director for three research projects including the development of a new water filtration system using local materials. Dr. Frankel will join SEATEC full-time in September.
- (2) Mr. Munsin Tuntoolavest, who will serve as Project Engineer, is a full-time member of SEATEC's staff. He has worked in Northeast Thailand, designed and supervised construction of rural water and wastewater treatment systems, and has taught in the Environmental Engineering Division, Khonkaen University.
- (3) Dr. Phiphit Suphaphiphat, who will serve as Economist, has been working on project appraisal and economic feasibility evaluations at the Applied Scientific Research Corporation of Thailand (ASRCT). His areas of specialty lie in agricultural economics and resource utilization.
- (4) Mr. Paichayon Shouvanavirakul, a full-time member of SEATEC's staff, is a native of Northeast Thailand and a former graduate student of AIT who started working with AIT's Community Water Supply research program in 1969. His thesis, "Demand for Potable Water in Small Communities of Thailand", was the first report of the program.
- (5) Dr. Titaya Suvanajata, who will serve as Social Scientist, has been working in the fields of rural sociology and political scientist with the Community Development Department of Thailand and as Deputy Director of Research at the National Institute of Development Administration. He has written extensively on the role of village leaders in community development and on villager attitude measurement.
- (6) Dr. Harvey F. Ludwig, President of SEATEC, who will serve as a member of the Project Review Board (PRB). Dr. Ludwig, in his consulting experience, has managed numerous research projects in environmental engineering, including several projects in water supply and treatment, and has served as Special Consultant to WHO on village water supply development.
- (7) Dr. Subin Pinkayan, an expert hydrologist, will serve as Consultant and a member on the PRB. His work in rural Thailand includes utilization of rainwater for village water supplies. Dr. Subin is an applied statistician and will assist in data analysis methodology.



- Detailed biographical information on the key staff is included in Appendix II.



TABLE 3

PROPOSED BUDGET AND PAYMENT SCHEDULE FOR WATER SUPPLY IMPACT ANALYSIS PROJECT(A) BUDGET(1) Personnel

(a) At regular overhead

<u>Position</u>	<u>Man-Months</u>	<u>Rate (฿1,000's)</u>	<u>Total</u>
Project Engineer	12	20	240
Jr. Engineer	15	6	90
Technical Assistants	30	3	90
Programmer	3	8	24
Secretary	6	5	30
Draftsman	6	3	18
Driver	12	1.25	15
Subtotal			507
Overhead (125%)			634
Total			1,141

(b) At reduced overhead

Project Director	4	44	176
Economist	3	20	60
Social Scientist	3	20	60
Overhead (@ 30%, excluding Project Director)			36
Total			332

(2) Other Expenses(a) Equipment

Water Meters (See Note 1)	40
Typewriter (English)	6
Vehicle (rental for 10 months @ ฿12,000)	120
Total	166

(b) Travel

Project Director and Consultants	10
Project Engineer and Staff	14
Per Diem (See Note 2)	130
Total	154



APPENDIX I

DETAILED WORK PLAN

Task 1: Detailing of Methodology

Considerable work has been done in Thailand in articulation of a structure and research design to assess the impact of various government programs on village life and villager behaviour as sponsored by the Research and Evaluation Division of the Community Development Department, Ministry of Interior, with financial assistance from USAID, ARPA, and USIS. In addition Chulalongkorn University, Mahidol Medical School, and the Asian Institute of Technology have carried out field research on measuring villager responses and involvement with government programs. The first task would involve collection and review of all work done, detailed discussions of methodologies used and careful delineation of the recommended approaches for recording, measuring, and analyzing impact of rural water supply systems in Thailand. The review and discussions will include work done elsewhere (e.g. Drawers of Water by Gilbert F. White, David J. Bradley and Anne U. White, University of Chicago Press, 1972, and the many studies related to referenced in this publication).

As a basis for discussion and analysis, the methodology developed by Dr. Frankel at AIT and presented recently for publication will be used as a starting point. His paper entitled "A Systems Approach to Assessment of Rural Water Supply Program Effectiveness" is enclosed as part of this appendix together with the questionnaires used to record villager statistics on health, water habits, water consumption, sanitation habits, economic and social status including family income, material possessions, annual expenditures, education, family population, etc.

The entire staff will participate in these discussions including all experts and consultants to be used in connection with the project. Decisions will be made as to selection of criteria, parameters, methods of measurement, and methods of data collection. Parameters chosen will be necessary and sufficient to determine whether the water systems have (1) had a positive effect on community attitudes towards local and central government; (2) provided an impetus to other community improvement programs; (3) fostered economic growth; (4) encouraged migration to the village; and (5) had a significant positive effect on water use habits, sanitation practices, and on the overall level of community health.

Personnel to carry out Task 1 will include the following:

Project Engineer	2 man-months
Junior Engineer	2 man-months
Economist	$\frac{1}{2}$ man-month
Social Scientist	1 man-month
Project Director	$\frac{1}{2}$ man-month
Special Consultants -	As needed

Schedule: Month 1 and Month 2



Task 2: Detailing of Data Formats

As shown on the sample questionnaires attached, one system of data collection using a numbered format for computer listing of data has been used. This system will be modified and improved to cover the criteria, parameters and methodology of data collection chosen in Task 1. All questionnaires, interview records, and other data collection forms will be card coded for uniformity and simplicity in data handling and for eventual computer analysis. An example of coded data sheets previously used in analysis of health conditions in central Thai villages is attached to the Appendix. The forms were filled in by sanitarians working in the field associated with secondary health clinics near the villages. The completed forms were collected weekly for coding, key punching and entering of the data into up-dated computer data banks. The data could then be read out for checking completeness, accuracy and locating possible areas.

In Task 2 the forms, questionnaires and field data collection sheets will be finalized and reproduced in sufficient number to allow field data collection to precede efficiently.

Personnel required to perform this task will include the following:

Project Engineer	1 man-month
Junior Engineer	1 man-month
Economist	$\frac{1}{2}$ man-month
Assistants	2 man-months
Programmer	1 man-month
Project Director	$\frac{1}{2}$ man-month

Schedule: Month 2 and Month 3

Task 3: Field Data Collection in Villages with and without Water Systems

A general preliminary review will be made of the areas in which community water supply systems have been introduced. The object of this review will be to select ten to twelve pairs of villages for further detailed study to carefully select the sample villages. The final sample will include ten villages, six villages with community water projects and four similar adjacent villages without community water projects. In other respects the villages will be similar in their basic characteristics. The following factors will be considered in pairing of villages: (1) population, (2) location and geographical layout, (3) economic base, (4) similarity of original water sources, (5) political and social structures, (6) religious customs, (7) public institutions existing before the installation of a community water supply, (8) type of water service provided, e.g., public fountains or individual house services, and (9) ease of access to large population centers and government medical treatment facilities.

Task 3 will send into the field one junior engineer and three assistants on a full-time basis to live and interview in the selected



villages throughout the wet and dry seasons. They will be assisted through regular visits by the Project Engineer, Social Scientist and Economist who will supervise data collection ease and completeness. Regular meetings will be held with the Project Director and Consultants to insure that data collected in the field are thorough, accurate and complete. Preliminary analyses will be made to verify the methodology and provide feedback for improving field data collection, efficiency of interviewing and cooperation with village leaders and local officials.

Through observational techniques and structured interviews held in the local dialect by specially trained Thai interviewers, the project will focus on assessing current status and recent changes of the following variables:

- (1) Perceptions of assets and liabilities of current living arrangements in the community, and whether water supply is spontaneously mentioned in these connections.
- (2) Attitude toward participation in initiating and planning a community facility, such as a public water system.
- (3) Attitude toward those persons who do take active roles in such projects.
- (4) The degree of satisfaction with past and present water systems in regard to quantity of water available, quality of water, type of service provided, and cost of service.
- (5) Knowledge of villagers regarding the health significance of potable water.
- (6) Perceived changes in the economic level of the community since the initiation of construction of the water supply (or a comparable number of months in "control" villages).
- (7) Changes in patterns of living and use of time resulting from the availability of piped water.
- (8) Information on migratory patterns in the paired villages.
- (9) Attitudes of villagers toward local and central governments and recent changes in these.
- (10) Expectations of success or failure in future community projects.
- (11) Social, cultural, and political readiness of the villages to participate in the "development process".

A survey and comparison of the general levels of health in the selected villages will be performed during this task. Several indices will be used:

- (1) statistics from local health departments on infant mortality, and general mortality from selected causes (these will be used only if there is evidence that these recorded data are reasonably complete and reliable); (2) school and work absenteeism; (3) selected laboratory studies, such as perhaps to estimate prevalence of parasitism; and (4) direct interview methods (as part of the survey above) to obtain reports on number of days confined to bed and number of days to reduce activity in the past month, and presence in the past week of signs and symptoms of water-borne diseases in household members. These questions will be

patterned somewhat after those asked in the AIT studies of diarrheal-dysentery cases in Bang Pa-In District. The health questions will be broadened to cover water borne, water-washed and water-based diseases as classified by White et al (1972).

Economic effects to be investigated would include the following:

- (1) Migratory tendencies in villages with and without water supplies.
- (2) Development of village retail markets.
- (3) Development of farm markets.
- (4) Development of cottage industries.
- (5) Development of service organizations related to the provision of potable water.

Some preliminary questions asked in the AIT surveys are shown in the questionnaires attached to the Appendix.

Personnel for Task 3 will include the following:

Project Engineer	3	man-months
Junior Engineer	9	man-months
Assistants	24	man-months
Economist	$\frac{1}{2}$	man-month
Social Scientist	1	man-month
Project Director	$\frac{1}{2}$	man-month
Special Consultants	-	As needed

Schedule: Month 3 through Month 12

Task 4: Development of Computer Programs

In order to handle the extensive amount of data collected for analysis, and to check for completeness and reliability, computer programs will be developed in the early stages of the project and tested throughout the field data collection period. The improved and corrected programs will be run at the termination of the field data collection Task 3 to assist in final analysis.

All data collected will be reduced and provided in the form which can be readily used by the computer. Typical programs to be developed will include listings of data, analyses of health, social and economic statistics, regression and correlation analyses, and multivariate techniques. Either CDC or IBM 360 Computer will be used for the computer studies. Some 20 hours of computer time have been set aside for the project.

Personnel to be used in Task 4 include the following:

Project Engineer	2 man-months
Junior Engineer	1 man-month
Programmer	2 man-months



Project Director $\frac{1}{2}$ man-month
Special Consultants - As needed

Schedule: Month 3 through Month 7

Task 5: Final Analysis

Considerable time and effort will be taken by staff and consultants in analysis of the reliability, accuracy, and completeness of field data collected by the project staff. Output from computer programs will be plotted and graphically presented for ease of presentation and discussion. Analysis among villages with and without the water systems will be made as well as analysis of differences between the two types villages. All changes relating to health, social, economic and organization variables will be analyzed and data presented by means, variances, and distributions. All the parameters noted in the text will be singled out and analyzed for importance as indicators of change or as affected by the water projects. Regression, correlation, and multivariate analyses will be carried out as needed.

Personnel for this task will include the following:

Project Engineer	2	man-months
Junior Engineer	1	man-month
Assistants	4	man-months
Economist	1	man-month
Social Scientist	1	man-month
Project Director	1	man-month
Special Consultants -		As needed

Schedule: Month 11 through Month 14



Record Removal Notice



File Title RPO Number 670-37 - Village Water Supply - Volume 1		Barcode No. 1043350		
Document Date undated (1973)	Document Type Report			
Correspondents / Participants				
Subject / Title Research Proposal on the Impact of Potable Water supply on Village Community Development - Appendix II Biodata for Key Staff				
Exception(s) Personal Information				
Additional Comments		<p>The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information. This Policy can be found on the World Bank Access to Information website.</p> <table border="1"><tr><td>Withdrawn by Ann May</td><td>Date 13-Feb-17</td></tr></table>	Withdrawn by Ann May	Date 13-Feb-17
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APPENDIX III

SUPPLEMENTAL DATA

A SYSTEMS APPROACH TO ASSESSMENT
OF RURAL WATER SUPPLY PROGRAM EFFECTIVENESS

Richard J. Frankel, Ph.D.^{1/}

Synopsis

Systems analysis was used to improve the methodology of impact evaluation by determining the role of resource constraints and complementary inputs in the development of the rural water supply program in Thailand. An impact evaluation was undertaken to analyse the effectiveness of the National Potable Water Project and to provide feedback to the government for improving the administrative, technical and operational aspects of the program. Objectives of the evaluation were to provide guidelines for design, construction, finance and administration of the potable water projects, operational guidance for management, information for training plant operators, and feedback on villager attitudes, water habits, water use and village development. The methodology developed measured the social, economic and public health implications of the water projects towards achieving rural community development. Data are being collected from some 165 village projects throughout Northeast Thailand.

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Introduction

One of the fundamental problems facing developing countries throughout the world is that of providing water supply to rural communities. Scarce resources - budget, foreign exchange, skilled personnel and time - are the main reasons why this problem remains unsolved today and probably why it will continue to plague developing countries for the next several generations. These constraints require all countries to allocate their rural development resources in the most efficient, productive pattern possible.

Recent research at the Asian Institute of Technology (AIT) in Bangkok has explored several approaches concerned with a particular way out of the dilemma: project and program evaluation, permitting the decision-maker to make maximum use of scarce resources by expanding his feedback loop of information based on the results of ongoing projects and development efforts.

The type of evaluation process chosen was the ex-post evaluation or impact study, and is essential to developing countries in assessing the actual impact or output from development projects. Just as feasibility studies are necessary to evaluate the technical and economic acceptability of proposed projects, so are impact studies necessary to assess the economic and social effects of projects already undertaken. By comparing a completed project's actual impact with earlier predictions during the feasibility and planning phases, forecasting techniques can be improved. Impact studies also indicate where a particular project

went wrong, why it did not produce the hoped for results. This will suggest corrective measures needed to revitalize a lagging project, or revisions to improve the composition of future projects of a similar nature. In addition, ideas for improving the technical aspects in both design and operation of the project will generally emerge. Successful projects present lessons as to what went right, providing insights for better selection and preparation of future efforts. This paper reports on the methodology developed to evaluate the effectiveness of Thailand's effort in providing potable water to rural communities and to demonstrate the improvements in impact evaluation made possible through application of systems engineering.

Rural Water Supply in Thailand: A Case Study

The Environmental Health Division (EHD) of the Department of Health is responsible for providing potable water to rural communities throughout Thailand. A regional Potable Water Project was started in 1966 as a major input to the development effort in the Northeast. By July 1972, about 165 potable water systems had been completed, serving some 357 communities with a total population of nearly 480,000. A map showing the general location of the projects is given in Fig. 1. Each project includes a treatment unit and a distribution system. The initial capital cost of these projects was approximately \$3,600,000. In addition, considerable sums were spent in building-up and training a professional staff, purchasing and maintaining equipment, travel, village selection and administration of the program.

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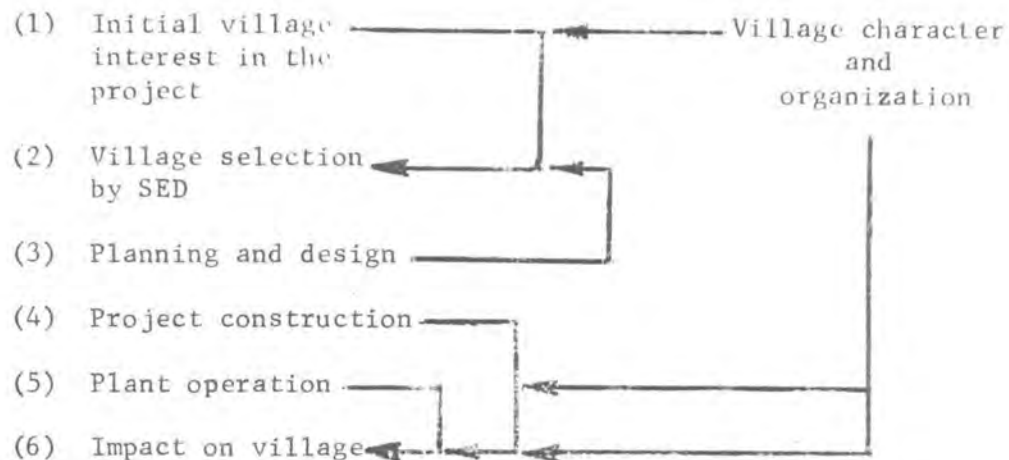
With an estimated 25,000 rural communities in Thailand still needing potable water supply systems, considerable future investment will be required if the program objective of eventually providing potable water to rural villagers throughout the Kingdom is to be realized. The Community Potable Water Project has now been underway for 5 years. At this juncture, with major decisions pending as to the future scope of the Thai government's efforts in the potable water area, an evaluation of the overall effort in terms of its physical design and operational and administrative effectiveness was needed.

A comprehensive evaluation of existing plants and the overall water program was undertaken to provide information vital to improving the planning and decision making process. The investigation, financed by the Royal Thai Government and administered by EHD through a contract with AIT, examined technical, operational and administrative factors related to the project's effectiveness. Objectives of the evaluation were to provide guidelines for design, construction, finance and administration of the potable water projects, operational guidance for management, information for training plant operators, and feedback on villager attitudes, water habits, water use and village development. Examples of the types of information needed to evaluate technical, operational and administrative effectiveness are given in Table 1. An equivalent of three man-years of labor was assigned to carry out the evaluation.

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Methodology of Project Evaluation

To insure that assessment of the Thai government's effort would be comprehensive, the entire potable water program was viewed from a systems approach. The official objectives of the program were first listed together with all measurable outputs from the program. Next complementary and hidden objectives were enumerated together with the factors affecting them. Several phases were delineated by a systems approach format and used to simplify interactions and identify variables affecting program success. Six of the project phases identified are shown below. The arrows indicate where feedback and interactions occur.



Within each phase all factors and individuals influencing decisions, including interactions between variables, were listed. Development of such lists required knowledge of agency regulations and guidelines, organizational and governmental hierarchies, financial constraints, trained personnel limitations, etc. Interviews with EHD officials, personnel and advisory staff were arranged in order to obtain the needed information and data were also collected from EHD files. In preparing

the detailed lists discrepancies were found between agency regulations and practice, between professional guidelines and project realities. These discrepancies provided valuable insights into the actual operations of the program and highlighted potential weak-points.

A detailed interaction flow-chart listing the factors that influence village selection is shown in Fig. 2. From this flow-chart the AIT researchers could more easily discern which factors were responsible for initial villager interest and what motivated participation of local government officials and EHD. Selection criteria used to choose a specific village to receive a water project were identified. It was found that political influences far outweighed village water needs in ranking selection criteria. The influence of the village leaders on the next higher official in the line of communication shown in Fig. 2 was more important in getting village "A" a potable water project than the scarcity of drinking water was for getting village "B" a project.

During the planning and design phase, delineation of factors indicated that the agency focused on the question of how to most easily arrange village "A"'s water problem to fit into one of their known designs. The approach provided expediency, simplicity and guaranteed the use of standard designs. However, differences between villages, such as geographic location, growth potential, water use, quality of water and availability of water source were minimized. Whether such differences should be secondary to simplifying agency tasks is a question this evaluation should answer. More flexibility in design criteria appears necessary if differences in village characteristics can offer cost savings.

Collection, Analysis and Feedback of Field Data

In analyzing the operational phase of the program, the methodology chosen involved, first, visits to all completed water systems to assess their operations, obtain data on costs, maintenance program, level of operator training, frequency of breakdowns, reasons for breakdowns and breakdown duration, percentage of villagers using the system, complaints on water quality, and problems experienced by plant operators. These data were collected on card-coded forms, compiled on computer and analyzed by simple statistical methods. The output tables serve as updated inventory records for EHD and provide valuable insights into maintenance program and village operator training needs.

As an example of the type of information obtained, Table 2 lists the recorded causes for plant shutdowns experienced during the last year. The list clearly illustrates the difficulties found in village plants - lack of funds to pay operators and maintain proper plant upkeep, poor training of operators and lack of understanding of how to repair broken parts, inability of operators to get spare parts, and the lack of a EHD follow-up maintenance program.

Corrective action was initiated by EHD this year partly as a result of the evaluation and a maintenance program is underway incorporating present scheduling of visits to village plants by trained mechanics equipped with some spare parts. More detailed information collected this year on duration of breakdown, cost of parts replacement or repairs, and type and make of part replaced will

improve the development of the maintenance program and provide feedback for setting up an effective maintenance organization.

Initial contact with plant operators is continuing by use of questionnaires which the operators fill out each month and mail in pre-stamped, addressed envelopes to district headquarters. Thus the operator feels that he has re-established his contacts with EHD, which otherwise were minimal after his training session. EHD will use data collected on these forms as the basis for maintenance visits. The questionnaires, specifically designed for simple entry of data, are picked up by AIT evaluation researchers from the district offices. The data are transferred to forms for computer analysis; the monthly information collected from these 165 plants is now available in a data bank.

Examples of other data analyzed for studying reasons of success or failure in certain community projects are given in Table 3 for the 16 provinces of the Northeast. Major differences in water rates were found (rates are set by the village committees themselves to cover anticipated operating costs - no capital repayment is required). Operator training, salary level and guarantee of salary each month was strongly correlated with the length of employment of the operator.

Based on initial data collected and tabulated by province, the second step was to select six typical village plants for an intensive plant operation and village impact study. These villages were chosen because of the water project's success or failure in technical operations

and in obtaining continuing villager support. Intensive study of day-to-day operations is currently being made at these village plants. Plant output, water quality and operational problems are being tabulated. Interviews with villagers elicit their reactions, while AIT resident researchers are studying actual water use habits. Insights are being obtained into the following three questions: (1) Why were some plants successful and others not? (2) Why do villagers support the program in some villages but not in others? and (3) What factors associated with the water projects affect village water use behavior?

In one of these six selected villages, Ban Fang, where the water treatment plant is less than 12 months old, a comprehensive villager attitude and village status survey was conducted by AIT prior to the installation of the project. Results of the old survey shown in Table 4, are compared with Ban Phonsawang, a village of similar characteristics already having the advantage of a potable water project. This table indicates that water habits were very similar in both villages, sanitation practises were identical, the influence of the water project on water use was small; however, more frequent bathing, more water used for gardening, and an observed improvement in cleanliness in the households was apparent. A larger number of privies were also found in the village with the water system. A new survey of Ban Fang is now underway which will provide data over a three-year time period - data necessary to measure project impact and change.

Summary

Success of the potable water system, both in providing clean water and in acting as a stimulant to broader community development, was found to depend to a large extent on three factors: (1) general compatibility of the system's technical design with local environmental conditions; (2) adequacy of administrative procedures adopted and (3) local operator efficiency. A deficiency in any one factor can result in system failure and public discontent. The evaluation study focused on these three factors, particularly on their relationship to success or failure of selected village water systems.

One of the principal conclusions from the impact study completed to date is that all projects in developing countries should be assessed (and designed) in a more comprehensive manner than has traditionally been the case. In particular, the concept of complementary inputs (other non-physical project inputs, such as villager education, operator training, etc.) needs to be emphasized if a development project is to attain the hoped-for impact. For example, it appears that provision of a community potable water system will not produce desired changes in village health and sanitation unless accompanied by a carefully-designed program of health education. The use of systems analysis in an impact evaluation will show whether or not these complementary inputs are missing from major infra-structure projects. Without them the changes in human behavior required to make the project work simply do not occur, or take place at a far slower rate than desirable.

Evaluation research in developing countries has been overly concerned with economic and technical aspects, neglecting the socio-political, psychological, institutional and administrative issues which in practice seem to determine project impact and effectiveness. Economic change is easier to measure than are changes in villager attitudes, rural behavior, or institutional performance. But since the latter are so often of overwhelming importance, they cannot be overlooked simply because they are difficult to handle, either conceptually or practically. Even though they cannot be readily quantified and placed in a single "rate of return" formula, the non-economic aspects of project evaluation must be explicitly included if these studies are to be of maximum value to decision-makers.

Finally, it has been observed in carrying out the evaluation study that the leadership group (operational personnel and decision-makers) should be directly involved in evaluation activities. These men must later use the results to alter program operations; if the leadership group is ignored or by-passed by researchers, they will react accordingly to the final report. The evaluation team must be certain to arrange periodic oral reports to learn of the specific concerns of the agency regarding the program under study. Such interaction will ensure that the research activities promote program change rather than report production.

Acknowledgements

The evaluation was conducted as part of a research contract between the Environmental Health Division, Ministry of Public Health, and the Asian Institute of Technology. The contract was financed by the Department of Technical and Economic Cooperation, Government of Thailand, with assistance from the Agency for International Development, Department of State, Government of the United States of America.

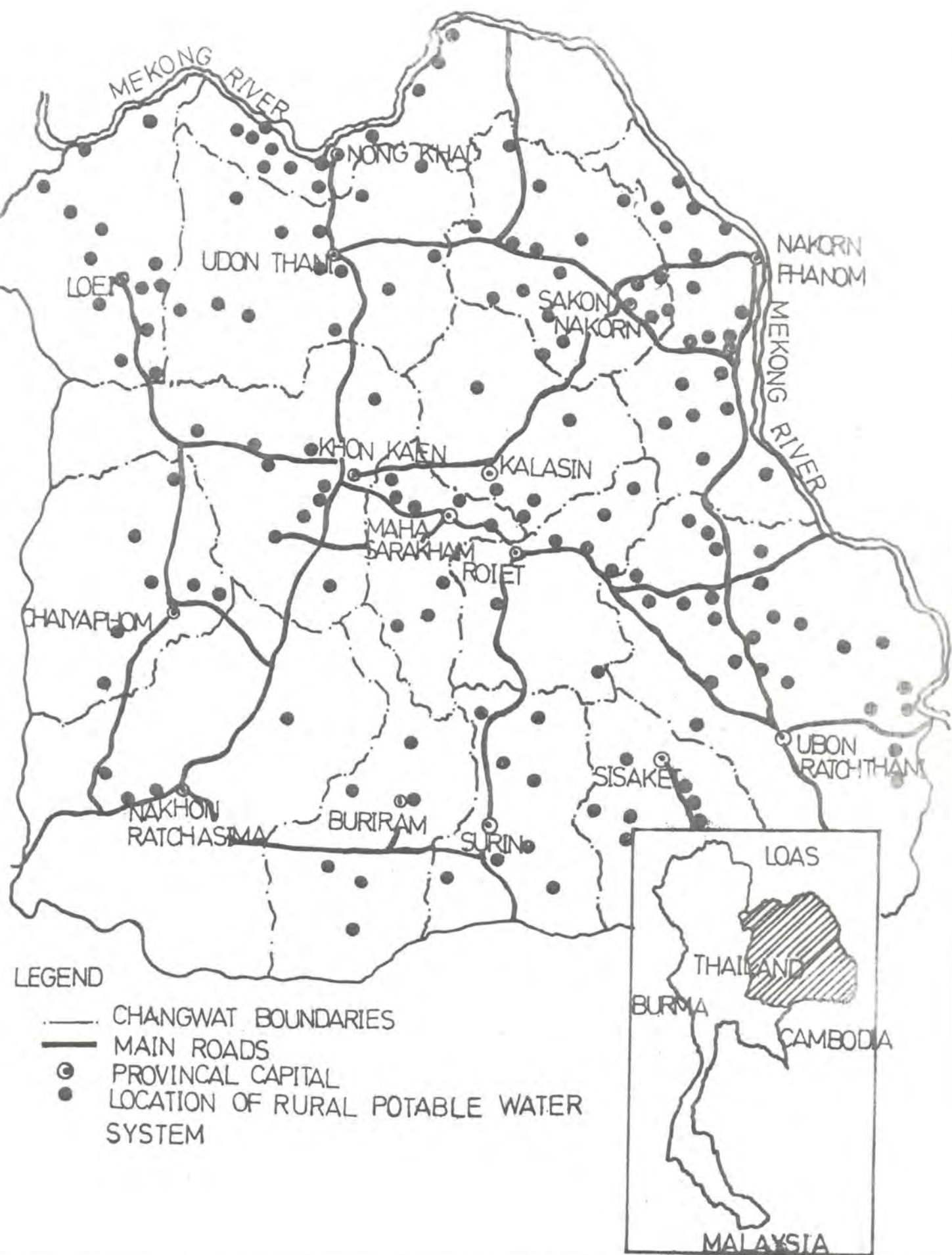


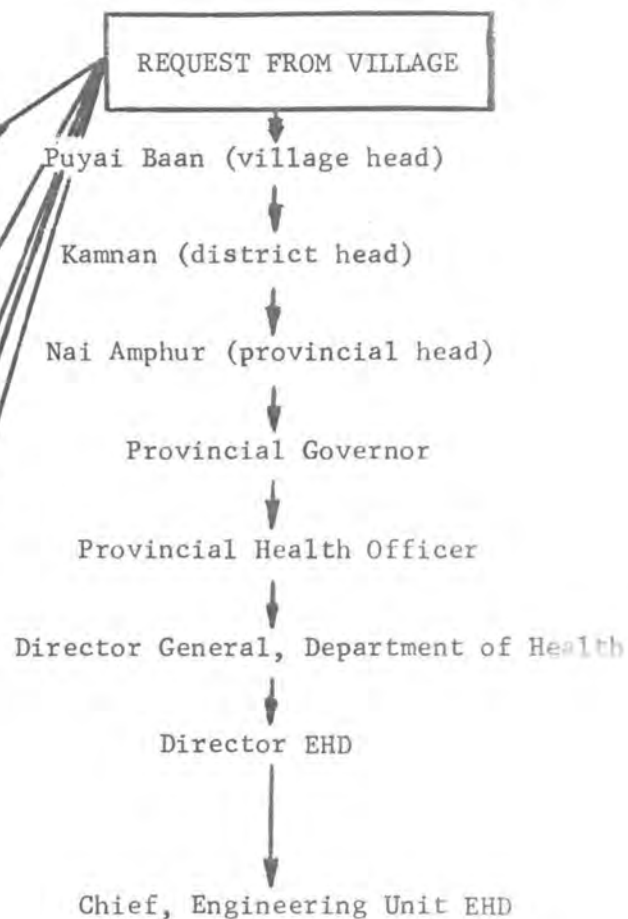
FIG.1-MAP OF NORTHEASTERN THAILAND AND GENERAL LOCATION OF RURAL POTABLE WATER SYSTEMS

Fig. 2 - Factors Affecting Selection Of A Thai Village To Receive Government Assistance For Construction Of A Potable Water Project

I. INFLUENCING FACTORS AFFECTING INITIAL INTEREST IN THE VILLAGE

- Villager visits to other towns with potable water projects
- Meeting with provincial Health Officials
- Community development or EHD NEWS
- Pressure of shopowners and wealthy landholders for a water system with house connections
- Shortage of water during parts of dry season

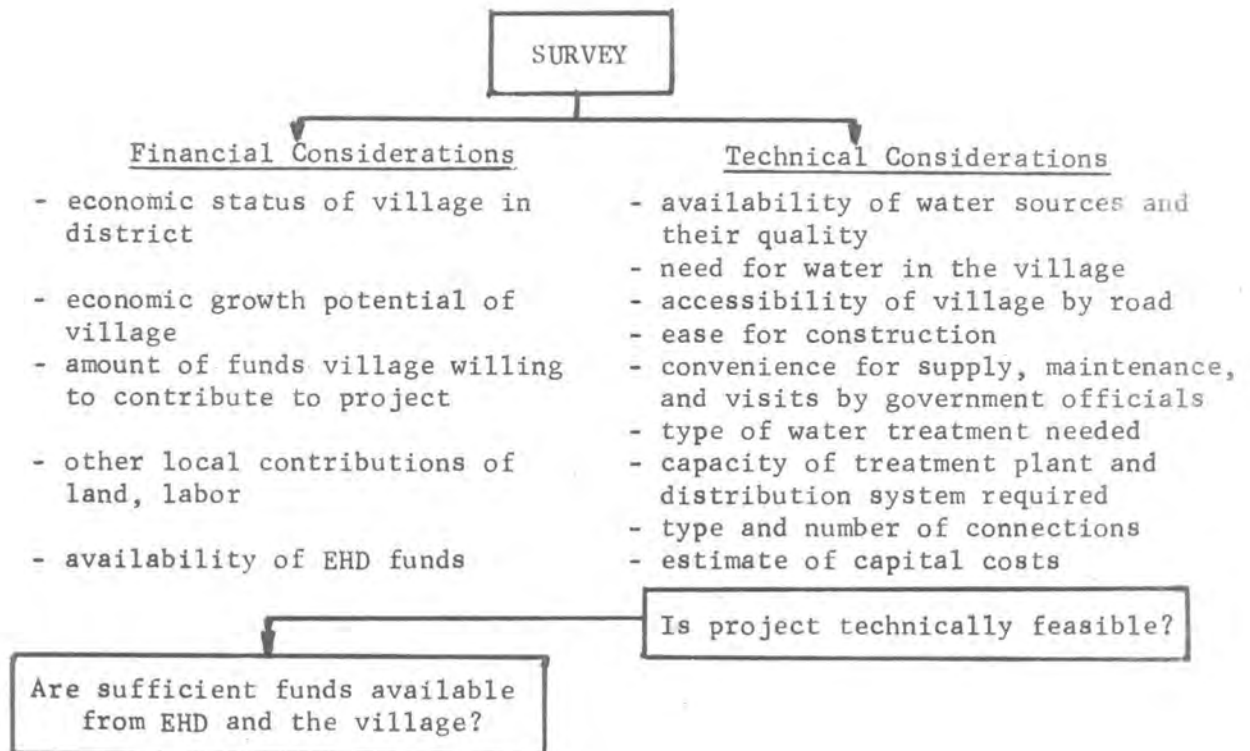
II. LINE OF COMMUNICATION NECESSARY TO INITIATE SURVEY ACTION BY THE GOVERNMENT



Chief directs engineers and technicians in District Headquarters to carry out a survey.

Fig. 2 (Cont'd)

III. FACTORS CONSIDERED IN SURVEY BY EHD



IV. POLITICAL CONSIDERATIONS INFLUENCING FINAL SELECTION BY EHD

- political status of village in district
 - is the village in an advantageous position to receive a favor from government officials?
 - has the village received a development project previously?
 - number of government officials in the village
 - population
 - designated as a sanitary district?
- influence of political figures in line of communications (part II)
- insurgency potential of village
- other objectives of government's community development program
 - distribution of village projects within region, district
 - sequence and tie-in of project with other government development programs
- willingness of village leaders to contribute to project
- willingness of other villagers to contribute to project

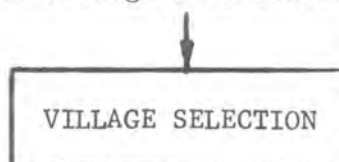


Table 1 - Factors Affecting the Efficiency of the Potable Water Project
in Thailand

I. Technical Aspects

- (1) Adequacy of preliminary studies
- (2) Appropriateness of design criteria
- (3) Water use - design standards versus actual use
- (4) Technical design of the system
 - (a) use of local village materials
 - (b) use of imported items
 - (c) suitability for construction under local conditions
 - (d) suitability for operation under local conditions
 - (e) maintenance considerations

II. Operational Aspects

- (1) Selection of operating personnel
- (2) Operator training and operator's salary
- (3) Operating manuals
- (4) Standard operating procedures
- (5) Quality of service provided
- (6) Operating records and reports
- (7) Operating materials and supplies - gas and oil, chemicals, chlorine, etc.
- (8) Maintenance procedures
- (9) Maintenance supplies
- (10) Operating and maintenance costs

III. Administrative Aspects

- (1) Administrative procedures
 - (a) project selection
 - (b) project design
 - (c) financial considerations
 - (d) construction
 - (e) operation
- (2) Village administrative organization
 - (a) appointment of representatives
 - (b) collection of capital funds
 - (c) collection of operating costs
 - (d) rate making procedures
 - (e) revenue disposition

Table 1 (Cont'd)

- (3) Administrative personnel
- (4) Purchasing and warehousing procedures
- (5) Construction bidding and supervision
- (6) Charges for water service
 - (a) water rates
 - (b) other sources of revenue
 - (c) collection of charges
 - (d) disposition of revenue
- (7) Procedures for system extensions
- (8) Communications
- (9) Public relations
- (10) Villager education

Table 2 - List of Causes For Village Water Treatment Plant Shutdowns
Northeast Thailand

1971-72 ^{1/}

A. <u>Economic Causes</u>	<u>No. of Plant Shutdowns</u>
1) No financial support from the provincial government	1
2) Difficulties in collecting money from consumers	15
Because:	
- people poor	
- public fountains too far	
- villagers say that they go farming, don't use water	
- taps were broken	
- operator's work not efficient	
3) No salary for plant operator	13
4) Too little salary for plant operator; not enough to support family	10
5) Would like EHD to give funds to pay for repairs, spare parts	3
6) No money to buy chemicals	14
Total	<u>56</u>
B. <u>Technical Causes</u>	
1) Inadequate raw water source - water level too low	9
2) Battery not charged	8
3) Pump broken	7
4) Quality of water not good (algae or taste problems)	2
5) Leakage of elevated tank	2
6) Inadequate pump power (not enough horse power)	4
7) Like to change benzine pump to diesel pump	12
8) No chlorinator	3
9) Public fountains broken	2
10) Like to change to electrical pump	3
11) Enlarge the elevated tank	2
12) Like to more floating intake pump to the bank, because the changing water levels affected intake	1
13) The filter rate is very slow; not adequate supply	3
14) Require main pipe to extend distribution system	13
15) Require repair tools	2
16) Require stand-by pump	<u>1</u>
Total	<u>75</u>

Table 2 (Cont'd)

C. <u>Education Causes</u>	<u>No. of Plant Shutdowns</u>
1) Don't know to mix chemicals and use	5
2) Like to know where to buy chemicals and other engine spare parts	8
3) Ask EHD to tell the villagers of the reason for collection of water charges	4
4) Like EHD to train operator once more	5
5) Require EHD assistance - where can locate an engineer or technician in case of problem - like EHD to send engineer or technician to check the engine and operation of plant every month - how engineers, technicals can help improve plant operations or fix broken items	17
6) Ask EHD to educate the villagers of the advantage of potable water supply; in order to enlarge the number of consumers	<u>4</u>
Total	<u>43</u>
D. <u>Management Problems</u>	
1) Like EHD to send officer to manage the water plant work instead of the village committee	5
2) Ask EHD to issue operator identification; for convenience of getting chlorine from sanitary district offices	3
3) Village committee not faithful in collecting the water money	1
4) Don't like water plant to be village property	1
5) Operator left the work	1
6) Like to use metered system	6
7) Like to have EHD technician stay at the plant permanently	2
8) Like to close all public fountains (so can collect more money)	2
9) Don't like to let the village heed keep the collected water money; in case of engine problem, difficult to get money back	1
10) One operator cannot do all the work	1
11) Like to buy chemicals from EHD	1
12) Like to have provincial officer collect the water money	2
13) EHD sold operator an old spare part (instead of a new spare part)	<u>1</u>
Total	<u>27</u>

^{1/} Sixty-nine (69) plants out of 79 plants sampled (87%) experienced some difficulties in operation during the year. In some cases, several shutdowns of different causes were experienced at the same plant.

Table 3 - Statistics of Potable Water Project, Northeast Thailand, 1972-73

Province	Number of Village Plants	Population	Percent of People Using Water System ^{1/}	Average Water Rates ^{2/}			Operator Statistics			
				Public Fountains	House Connections		Ave. Hours Plant Operating per Day	Percent Operators Trained	Average Length of Employment (months)	Average ^{3/} Salary
					฿/House per Month	฿/House per Month				
Khon Kaen	11	35,800	66	7.3	11.6	2.7	5.6	91	24	470
Loei	15	107,900	64	6.9	13.4	3.0	9.4	27	19	320
Chaiya Phum	7	26,300	59	3.5	5.4	2.0	5.2	71	14	370
Nakhon Ratchasima	4	10,900	52	7.5	8.0	-	5.7	100	12	450
Udon Thani	13	44,800	40	3.7	8.5	2.9	5.4	61	40	540
Nong Khai	12	40,700	63	8.0	11.8	3.5	6.4	75	42	530
Sakon Nakhon	17	44,900	47	4.7	9.9	2.5	4.2	76	25	450
Nakhon Phanom	20	44,600	67	5.2	7.7	2.0	8.1	65	32	330
Kalasin	5	16,800	33	7.7	11.3	-	3.8	80	10	430
Maha Sarakam	8	32,500	34	3.0	18.3	3.0	3.7	50	27	520
Buriram	5	19,200	19	5.0	8.3	3.0	3.6	60	14	370
Surin	8	23,800	35	3.5	7.5	2.5	5.2	63	25	510
Ubol Ratani	20	54,100	55	6.0	9.9	3.5	4.4	80	28	380
Srisaket	6	16,100	73	3.0	7.5	3.0	7.0	50	22	500
Roi-Ed	7	33,100	40	6.5	20.0	2.9	4.5	71	24	460
Yasotorn	4	7,900	85	4.0	3.5	-	5.2	75	42	500

^{1/} Values are approximate and reliable only for that period of time in which the survey was completed. In villages where the plants were shutdown for extended periods, the percentage of population served was taken as zero. This would change of course as soon as the plant were in operation again. However, the values do indicate that a large number of villagers are not receiving water from the treatment plants.

^{2/} Rate of exchange 20.8 ฿ (Baht) = U.S.\$ 1.00

^{3/} In 35% of the villages the operator did not receive his salary every month.

Table 4 - An Analysis of Water Habits, Sanitation and Health Conditions in Two Northeastern Thai Villages, 1971

Factor	% of households in village	
	Ban Fang	Ban Phongsawang
1. Source of drinking water (dry season) ^{1/}		
- public shallow wells	98.0	100.0
- piped water	not available	exists but villagers do not drink it
- local surface sources	2.0	-
2. Boil drinking water every time	4.0	3.0
3. Water used for washing		
- piped water	-	76.0
- shallow pond	100.0	18.0
- shallow well	-	6.0
4. Houses using above 200 l/day/family; %	34.0	52.9
5. Availability of privy	58.3	87.0
6. Washed hands before meal		
- often	46.0	41.0
- every time	39.0	34.8
7. Washed hands after going to toilet		
- often	42.0	45.5
- every time	32.0	30.2
8. Houses using water for gardening, watering trees; %	2.0	9.1
9. Houses storing more than 4 jars of water; %	25.5	33.4
10. Villagers taking more than 1 bath/day; %	68.0	92.4
11. Observed kitchen cleanliness		
- clean and rather clean	36.0	77.3
12. Often wash vegetables, fruit before eating	80.0	86.4
13. Eat meal with hands	73.6	60.9
14. Eat meat raw or not well cooked	53.7	57.2
15. After initial period of illness		
- but drugs themselves	43.9	62.1
- go to provincial Health Centre	11.4	3.0
- go to hospital, clinic	21.0	16.7
16. Incidence of water related sicknesses (within last year)		
Eye disease	6.9	5.7
Typhoid, cholera	6.3	7.6
Kidney, bladder disease	13.8	11.3
Worm disease	3.1	4.7
Stomach or intestinal sicknesses	64.0	65.2
Skin diseases	8.2	7.6

^{1/} Source of drinking water in wet season is rain water in both villages.

Individual Household Questionnaire

Name

Surname

Family Number

5	6	7
---	---	---

Ban

1	2
---	---

Tambon

Amphoe

Changwat

3	4
---	---

Date

Month

8	9
---	---

Year

10	11
----	----

No.

Question

Code

I. Data on head of household and Members of household

Card No. I

1. What is your status in the household?

12

1. Head of household

2. Wife of head of household.

3. Other (Specify)

2. Sex of head of household

13

1. Male

2. Female

3. Ageyears

14 15

4. Number of your children (Those having left the household also included)

16 17

5. Total number of persons in household.....

18 19

6. Age of members of household

0 - 1	yrs.	.....	persons
1 - 5	"	.....	"
6 -10	"	.....	"
11 -15	"	.....	"
16 -20	"	.....	"
21 -25	"	.....	"
26 -30	"	.....	"
31 -35	"	.....	"

20
21
22
23
24
25
26
27

36 - 40 yrs.	..... persons
41 - 50 " "
51 - 60 " "
61 - 70 " "
7 - 70 " "

28
29
30
31
32

7. Level of education of head of household

33

1. Illiterate
2. Below Prathom 4
3. Prathom 4
4. Mathayom Suksa 3
5. Mathayom Suksa 5
6. Other

8. Total number of members of household who are over 15 years of age and illiterate persons.

34

9. Number of members of the household who are over 15 years of age and completed school grades above that of prathom 4 level

- | | |
|----------------------------|---------------|
| 1. None | persons |
| 2. Prathom 5 - 7 | " |
| 3. Mathayom Suksa 1 - 3 | " |
| 4. Mathayom Suksa 4 - 5 | " |
| 5. College or Trade School | " |
| 6. University | " |
| 7. Other | " |

35
36
37
38
39
40
41

10. Religion

42

1. Buddhism
2. Khong Chue (Chinese Buddhism)
3. Christ
4. Other

11. Race

43

1. Thai
2. Chinese
3. Other

II. Data on Public Health

1. Did any member of your household get sick during the past week?

..... No.

..... Yes

Type of sickness	Number of sick persons
1. Head-ache (serious)	
2. Sore-Throat, Chronic cough, influenza	
3. Disease of stomach, duodenum	
4. Worm disease	
5. Kidney disease, edema, stone	
6. Nervous break-down	
7. Eye disease	
8. Skin disease	
9. Typhoid, Cholera	
10. Beri-beri, nutrition disease, weakness	
11. Disentery, diarrhea.	
12. Other	

44	45	46
----	----	----

2. When a member of your household gets sick,
What do you do during the initial period of illness?

47	48
----	----

1. Do nothing
2. Buy some medicine from drug-store
3. See a spirit doctor
4. See a quack
5. See the Tambon doctor
6. See a traditional doctor
7. See a nurse or a mid-wife
8. Go to public Health Station
9. Go to a hospital or a clinic
10. Other

3. How do you prepare meat (Larb, Pla, Goi) for your meal?

49

1. Like to eat raw meat
2. Like to eat rare meat
3. Like to eat Well-cooked meat

4. If you eat fresh vegetables, do you usually clean them before eating?

50

1. Never
2. Once in a long while
3. Sometimes
4. Frequently
5. Everytime
6. Other

5. How do you eat your meals?

1. With hand
2. With fork and spoon
3. With Chop-sticks
4. With spoon

6. Do you wash your hands before having meals?

1. Never
2. Seldom
3. Sometimes
4. Everytime

7. What kind of a privy do you have?

1. None
2. A privy within the house
3. A privy outside the house
4. Septic tank with cover
5. Septic tank without cover
6. Bucket privy
7. Other

8. How often do you use your privy?

1. Everytime
2. Seldom
3. Sometimes
4. Never

9. Do you wash your hands after going to the privy?

1. Never
2. Sometimes
3. Everytime

When washing your hands, do you use soap?

1. Yes
2. No.

53

54

55

56

10. What kind of water do you use for drinking?

57 58

1. Piped Water
2. Rain Water
3. Water from dug Wells
4. Water from ponds, lakes
5. Water from streams, rivers

Dry Season	Wet Season

11. Do you treat your water before drinking?

59 60

1. No
2. Yes, treating by using alum
3. Yes, treating by boiling - sometimes
4. Yes, treating by boiling - everytime

Dry Season	Wet Season

12. What kind of water do you use for washing and cleaning?

61 62

1. Piped water
2. Rain water
3. Water from dug wells
4. Water from ponds, lakes
5. Water from streams, rivers
6. Water after settled in earthen jars
7. Other

Dry Season	Wet Season

13. How much water do you use each day?

- | | | |
|-------------------------|--------------|----------|
| 1. For drinking | Approx | Tang/day |
| 2. For cooking | " | " |
| 3. For washing, bathing | " | " |

63	64
65	66
67	68

4. For vegetable gardening

Approx Tang/day

69	70
----	----

5. Other

" "

71	72
----	----

14. How often do you bathe?

73

1. Once every other day

2. Once daily

3. Twice daily

4. More than twice daily

15. How much water do you store?

74	75	76	77
----	----	----	----

Big Jar amount....

Small Jar amount....

Dry Season	Wet Season

16. Do you use piped water for vegetable gardening?

78

1. No

2. Yes

Card No. 2

17. You use piped water -

12

1. Only during dry season

2. Throughout the year

3. Throughout the day (all day long)

4. Only in the morning and evening

5. Do not use at all

18. If you use piped Water for drinking, do you like the taste?

13

1. Yes

2. Sometimes

3. Not at all, because

19. Do you get adequate supply of piped water for your household consumption?

14

1. Yes
2. Only during some days
3. No

20. After having the system, your use of water has....

15

1. increased,
2. decreased.
3. stayed the same
4. do not know

21. How much do you pay for the water each month?

16 17

..... baht

22. How do you feel about the present water rate structure?

18

1. Just
2. Unjust; because

The price of water should be set by

19

1. metering every house
2. same price per month per house
3. different price per house depending on size or wealth of family

23. Do you think your cost for water each month expensive?

20 21

0. No

Yes

If yes, how much do you think it should be? Baht.

24. In case there is no water system,

1. Who is responsible to fetch water?

22

1. Daughter
2. Son
3. Other

by entire family

2. Time consumed/each day for fetching water

23	24	25
----	----	----

..... minutes..... hours

3. - 1. Buy water from seller

26

2. Sometimes buy water from seller

3. Do not buy, fetch themselves

25. What do you think one should do or have

27	28	29	30
----	----	----	----

in order to be healthy and free of sicknesses?

1. Do not know

2. Eat plenty of food

3. Eat clean and properly prepared meals

4. Eat useful food

5. Drink clean water

6. Clean house

7. Clean clothes

8. Good and fresh air

9. Exercise and not too hard work

10. Vaccinate every time when informed by bovernment authority

11. Other

26. Cleanliness (by observation)

1. Clothes

2. Body

3. House

4. House building grounds

5. Kitchen

6. Privy

Very Clean	Fairly Clean	Rather dirty	Dirty
1	2	3	4

31

32

33

34

35

36

III. Data on Income and Expenditure

1. What was your income last year from the following items

(whole household)?

1. From selling rice	..... Baht	<div>37</div>	<div>38</div>	<div>39</div>	<div>40</div>
2. From selling vegetables, fruits	..... "	<div>41</div>	<div>42</div>	<div>43</div>	<div>44</div>
3. From selling jute, Kenaf, Kapok	..... "	<div>45</div>	<div>46</div>	<div>47</div>	<div>48</div>
4. From selling livestock, fish, etc.	..... "	<div>49</div>	<div>50</div>	<div>51</div>	<div>52</div>
5. From land and labor-animal lease "				
6. From house industry products "				
7. From trading "				
8. Salary, wages "				
9. Other "				
<u>Total</u>	_____ "	<div>53</div>	<div>54</div>	<div>55</div>	<div>56</div>

2. Money left over from your last year income

(whole household)

57

58

59

0. None

1. Baht

3. What were your three largest expenditures

paid last year?

60

61

62

63

64

65

1. None

2. Food

3. Clothes

4. Education (school)

5. Medicine

6. Agricultural supply (not including land)

7. Home industrial materials

8. Land and other investments

9. Gold and jewelry

10. Wages payments

11. Debt and interest payments

12. Other

4. What livestock do you have available?

Livestock	Number presently available	Number sold last year	Price per head
Cattle			
Water buffalo			
Swine			
Duck			
Chicken			
Goose			
Other			

66	67
68	69
70	71
72	73
74	75
76	77
78	79

Card No. 3

=====

5. Land you presently own and that you owned
before the water system was installed.

1. At present: rai

2. Before having the system: rai

3. New resident in the village

12	13
14	15
16	17

6. Land you now lease and leased before the
water system was installed.

1. Lease now rai

2. Leased before having the system..... rai

18	19
20	21

7. Do you give land as a credit when you borrow money or do you get land from someone else when you land borrows?

22	23	24
----	----	----

1. Neither
2. Give land as credit rai
3. Get land as credit rai
4. Other

8. Land owned at present time compared to that owned 3 years ago.

25

1. Same as 3 years ago
2. Increase, compared to 3 years ago
3. Decrease, compared to 3 years ago
4. Do not know

9. If the village has a water system, would you like to have a house-connection?

26

1. Don't mind if having house connection or not
2. Like to have house-connection.
3. Don't like to have house-connection; because do not have money; public tap is near the house

10. Do you use the piped water system

27

1. No piping to house or nearby area; therefore, do not use piped water
2. Use piped water through house-connection
3. No piping to house, but use piped water through public tap.

11. When you borrow money, livestock, equipments or tools, you pay an interest of -

28	29
----	----

1. Do not know because I never borrowed anything
2. Interest % per month
3. Other

12. Do you presently and did you, before the potable water system was established in the village, own any of the following items? If so, please state quantity

Item	Quantity at present	Quantity before having system.
1. TV. Set		
2. Radio Set		
3. Motorcycle		
4. Bicycle		
5. Ox-cart		
6. Sewing machine		
7. Wall clock		
8. Wrist watch		
9. Air pressure lantern		
10. Thermos		
11. Privy in house compound		
12. Other (Specify)		

30	31
32	33
34	35
36	37
38	39
40	41
42	43
44	45
46	47
48	49
50	51
52	53

13. Are you satisfied with your present condition?

54

1. Do not know
2. Satisfied
3. Want improvement, but do not know what to do
4. Want improvement and have already done something
5. Other

14. Do you think your economic status has changed during the last year?

55

1. About the same as before
2. A little better
3. Much better
4. A little worse
5. Much worse
6. Other

15. Observe the economic status of the house
(according to the local conditions)

56

1. Very rich
2. Rich
3. Average
4. Poor
5. Very poor.

Longitudinal study of incidence of diarrhea in residents
of Bang Pa-In, Thailand

1. Did you suffer from diarrhea or stomach-ache during the last 7 days?

0) No

1

1) Yes

☐

2. If yes, is the excrement mucus-like with blood?

0) No

2

1) Yes

☐

2) All liquid with no mucus and blood

3. For how many days did you suffer from diarrhea?

1) 1 day

2) 2 days

3) 3 days

4) 4 days

5) 5 days

6) More than 5 days

3

☐

4. On the average, how many times a day did you go to the toilet?

1) 1-5 times

4

2) More than 5 times

☐

OFFICE MEMORANDUM

TO: Mr. Y. Rovani, Director-PBP

FROM: A. Ray, VPD *AR*

SUBJECT: External Research Budget
FY74 Allocations

DATE: August 2, 1973

The FY74 allocations for the research projects in your department are shown in the attached table. Projects not listed in that table do not have any budgetary authorization this fiscal year.

If there are any questions on these allocations, the project supervisors should get in touch with me by August 8.

cc with attachment: Messrs. Berrie, Warford, Anderson
Sckolnick, Smith, Ms. Hazzah
Project files

Attachment

FY74 AUTHORIZATIONS
FROM THE RESEARCH PROGRAM BUDGET

Public Utilities Department

<u>Code</u>	<u>Title</u>	<u>Amount (\$,000)</u>
238	Village Electrification	68.0
239	Pricing and Investment in Electricity	17.0
✓ 237	Standard of Reliability in Electricity Supply	20.0
276	Pricing and Investment in Telecommunication	22.0

#237

OFFICE MEMORANDUM

TO: Mr. A. Ray
FROM: J. Warford
SUBJECT: Research Pamphlet

DATE: June 22, 1973

With reference to your memorandum of June 19, the following amendments to the Research Pamphlet are required:

PROPERTY VALUE ENHANCEMENT AS AN ESTIMATE
OF WATER SUPPLY/SEWERAGE BENEFITS RPO 236

Delete last paragraph and add:

Analysis has now been completed, the final report being expected to be available by August 1973. The project is being carried out by Professor R. Bahl of Syracuse University: staff member responsible, J. Warford.

VILLAGE WATER SUPPLY RPO 237

||| This can be deleted as it will not be in progress as of July 1.

JWarford:pfa

OFFICE MEMORANDUM

TO: Mr. A. Ray

DATE: April 2, 1973

FROM: ²⁶T.W. BerrieSUBJECT: Meeting of Research Committee April 5, 1972
Further Submissions to the Research Committee during FY74

Following our telephone conversation of last week, I give below the estimate of further submissions to the Research Committee likely to be made during FY74 by the Public Utilities Department, beyond what has already been requested, our limit being imposed by the number of man-weeks of supervision available in the department.

	Title of Submission	FY74 Cost \$	Expected Date of Submission	Remarks
238	Village Electrification	60,000	April 1973	
239	Public Utility Pricing	60,000	April 1973	Including Case Study.
267	Standards of) Urban) Distribution)	20,000	September 1973	(In addition to the \$20,000 for (Stage I(a) and \$16,000 for (Stage I(b)
✓ 237	Water Supply	20,000	December 1973	(This is to continue the work (already in progress, once (an acceptable proposal has (been received by the depart- (ment. Several have been (rejected to date.

cc to Messrs: Rovani, Howell, Shipman, Jennings, Anderson (o/r), Warford (o/r),
Friedmann (o/r), Berrie

Files

TWBerrie:jr
IBRD

Mr. W. J. Armstrong

June 16, 1972

Ernest Stern

Village Water Supply

This is to advise you the the Bank Research Committee has approved \$20,000 for the Village Water Supply Project, taking into account the recommendations of the Review Panel which stressed the still exploratory nature of the project and its uncertain project design. Additional financing will be considered after the first phase report is available for review and a more thorough description and costing of the Phase II (field surveys of rural water programs) work program is available. Please contact Mr. Ray to discuss with him the budgetary data as soon as convenient.

cc: Mr. J. J. Warford

OFFICE MEMORANDUM

TO: Mr. Ernest Stern

DATE: May 26, 1972

FROM: H. van der Tak, N.G. Carter and O. Yenai *q/*SUBJECT: Meeting of Research Committee Panel, May 26, 1972

The panel met to consider three projects in transport, and one in public utilities. In general, the panel felt that the projects presented were of a higher caliber and more clearly defined than the seven presented to the first meeting, and thus more deserving of Committee approval. However, one member of the panel dissented from this conclusion, his comments are attached.

1. Criteria for Choice Between Electrification and Diesel Traction in Project Evaluation

We recommend that approval be given to this project but that a number of changes be made to the research strategy.

- a. It was felt that the list of countries to be looked at created a bias in the sample and thus we request that there be some changes so as to include less developed countries and more skill scarce countries.

- b. We are concerned that the study may easily become a specific costing study, particularly centered around the cost of fuel. In our opinion the study should provide the analytical and methodological framework into which the costs in a particular country can be inserted for the analysis of a specific project. It should not, however, allow the particular cost structure of a sample country dictate the analytical structure of the method which emerges.

- c. The internal Bank support for this study seems inadequate. While this will depend somewhat upon the consultants chosen and what they agree to do, we think it would be desirable to program initially more staff than is now indicated. This will be particularly critical with respect to (b) above, where we feel that the parameters of the analysis should be developed jointly by the Bank and the consultants.

2. Government and Bank Assistance to Road Transport

We recommend that this project not be approved. Our reasons are as follows:

- a. This is an important question, but this is not the way to do it - we suggest a special sector survey, or short of this the attachment of a road transport economist to a

*informal to
show the
technical parameters
fit - analysis
would be developed
cost comparison of funds
on technical feasibility
on well as system effects*

May 26, 1972

regular sector survey with a specific brief to look at the question of trucking.

- b. The Bank staff proposed is simply inadequate.
- c. The conceptual thinking of the proposal appeared very ill defined to us.

3. Study of the Price Elasticity of Demand for Port Services

Although we approve of this in the amount specified, we have several strong recommendations upon which approval should be made contingent.

- a. The study should be divided into three phases, the first of which would be to obtain from AIT, before the study starts, a detailed proposal, which outlines specifically the problem to be studied and what is going to be researched. The second phase should be confined to the study of one port, and the final one to the comparative analysis of several ports.
- b. It must be made clear, or at least the methodology must be designed so as to be able to distinguish, what type of elasticity is being researched, the elasticity of shipping, or the elasticity of throughput of goods at the port.
- c. The second phase of the study should be designed so as to obtain some idea, if possible, of the effect of cost structures on competing ports.
- d. It should be made clear the extent to which port costs have an effect on the shipment of goods and to what extent they are absorbed by the shippers - this is related to point b.

4. Village Water Supplies

This is a continuation of a project approved last year. The panel approves the project, however, it should be made clear that this decision is based more on our judgment of the abilities of Mr. Warford than on the specific technical content of the project proposal. This is clearly an exploratory project and we assume that Mr. Warford will provide the committee with detailed cost estimates before withdrawing the funds approved.

van ~~Warford~~ Tak/Carter/Yenal:lcm

Recommend
\$20,000
for completion
of study with
further work.
WTS

OFFICE MEMORANDUM

TO: Mr. H. van der Tak

FROM: Oktay Yenil

SUBJECT: Research Projects

DATE: May 26, 1972

I would like to note that I attach lower priority to the following research projects than implied by the majority report of our panel.

1. Criteria for choice between electrification and diesel traction in project evaluation.

- (a) The study seems to be not on criteria, but on the quantification of parameters involved;
- (b) The study will concentrate on developed economies;
- (c) Methodology is not well defined.

2. Price elasticity of demand for port services.

- (a) This study should follow and be part of, rather than precede the general study on port pricing;
- (b) I am not sure that the results of price elasticity in a particular region will shed much light on the general problems of port pricing;
- (c) Details of study are not clear.

3. Village Water Supplies.

As I understand it, the intention is to have some field trips for impressions on this topic. There is no structured research methodology, nor will the result yield a research project. Although this looks to be an important area where little is known, I believe that the orientation activities should be part of the operations missions rather than be financed by the research budget.

Meeting of Panel on Research Projects, May 22, 1972

Present: van der Tak (Chairman), H. Adler, Carter, Yenai

1. General Considerations

It was felt that a good part of the proposals were an attempt to substitute research funds for the lack of success in obtaining ordinary budgetary allocations. This was especially true in the Caribbean tourism proposal and in one or two of the Transportation and Public Utilities Division proposals. This is a particularly inopportune moment to be holding Research Committee hearings, which perhaps should precede the final cutoff date on the regular budget. Clearer guidelines to differentiate between "research" studies, financed from the research budget, and "operational" studies such as, e.g. sector surveys, would also be helpful (see sub 2a below).

It was also felt that, whether due to the poorly designed forms, or to the desire of division chiefs to get a little budget flexibility, the proposals were in general much too broad and ill defined. It was in some cases almost impossible to break up large requests either in content or in time. The Research Committee should consider in what condition, if any, it may be appropriate to make program allocations for broadly conceived research areas, leaving detailed allocation to whoever is responsible for the areas of research, and in what condition it should continue to allocate funds for specific studies, or parts or phases of studies.

2. Projects Considered

Total of seven, two in tourism, one in transport, one in telecommunications, and three in power.

a. Caribbean Tourism (VHN-40-PTUR). This study seemed to the Panel to be virtually a sector study and thus probably appropriately placed in the operational budget. In this case the Projects Department had been turned down in its request for staff or consultant funds and had thus turned to the Research Committee. There are 25 countries in the region, each with its own bits and pieces of information, nothing consistent, and only in the case of the larger areas (Jamaica, etc.) has any attempt been made to make an inventory of facilities and an estimate of present and future demand. The study also wants to purchase information on U.S. market (\$6,800) but it is not clear why we should have to buy this. It appears a good study for financing by UNDP, but they (for bureaucratic reasons) are not interested. Consensus of the Panel is that Research Committee should not approve this proposal, without prejudice to its merits as a regional sector survey.

b. Tourism Incentives (VHN-17-PTUR). This is a two-part study, focused in the Mediterranean area and motivated by the apparently burning question of interest rate and other subsidies given to tourism. Question is what sort of incentives are really needed for a country to benefit as much as possible from tourism, and then what are the effects of different

subsidies. This study is divided into two parts, the first on the existing incentives, and the second on the impact of incentives. The identification and definition of the problems and method of study should be given more weight than mere data gathering in the first phase, which essentially is preparatory. Panel recommends approval of \$12,000 for consultants (plus \$5,000 for travel and subsistence) as requested for Phase I of study. Approval of Phase III (amount unspecified) subject to satisfactory detailed proposal by consultants.

c. Substitution of Labor and Equipment in Road Construction (VHO-158-ECD).

This is an ongoing study, considered to be quite significant. The Panel felt, however, that its parts and costs were ill-defined in the request. It was not at all clear what is to be spent, what are the critical parts of the exercise, what can be delayed, and how much flexibility is minimally required. The Panel had difficulty in evaluating the new request for funds because it was not clear how this fitted in with the several phases or parts of the project which should be separately identified and costed. It seemed this enterprise was being conceived as a program rather than as a project. Because of the large sums of expenditure involved, the Panel feels that a more precise definition of the work to be done and its costing is necessary before further large commitments are made. Funds are requested for FY 1973 to complete the current phase of field work in India and Nepal, as well as to carry out field work in Indonesia now in an advanced state of preparation. Mr. Churchill has indicated by phone that some \$90,000 would be required in the first half of FY 1973 to finance this work, of which \$35,000 (?) has already been contracted for. The remaining \$50,000 (?) of his total request of \$100,000 for FY 1973 is for further work beyond the current (extended) Phase II. The Panel recommends that Mr. Churchill break down the study into definable parts and that he give the Research Committee some estimate of the costs of delay and restarting were he not to get the full \$90,000 he requests at this point for completion of Phase II. The Panel also recommends that no further funds be made available beyond Phase II, without careful review of the results obtained (draft final report of Phase II expected in Jan. 1973).

d. Economics of Telecommunications (VHO-46+-ECD). This is an attempt to revise the methodology of project appraisal for telecommunications from the present engineering and financial criteria to a more comprehensive set of economic criteria. To date significant progress has been made in defining and acquiring theoretical understanding of the behaviour of costs in this complex technology and the present request is for a field study and for completion of the economics of telephony. It is not clear where these are divided. The initial field study in Costa Rica focuses on the behaviour of costs and is to provide a basis for completion of a paper on the cost structure of telecom systems, expected by late Fall 1972. The Panel recommends approval of \$15,000 for the case study and completion of this paper. Subsequent work on demand and the tariff structure should be considered separately (some funds, say \$15,000, should be kept in reserve for this purpose). The involvement of Mr. Turvey (see f) should also be clarified.

e. Standards of Reliability in Electricity Supply (MN-27-PUD).

This study addresses itself to an important operational question: What are

costs and benefits of varying standards of reliability with respect to technical reliability and costs of breakdowns as well as to reserve capacity to meet uncertain demand growth. The question is very controversial and there are considerable differences of opinion as to the eventual size of the investigation, its primary focus, and suitable approach. The request is for a preparatory phase to work out, with the help of several consulting firms, detailed terms of reference for the main study. The panel recommends allocating \$10,000 for the first phase. The main study is to start in the second quarter of FY 1973; its cost is as yet undetermined, but \$30,000 may be needed for the remainder of FY 1973.

f. Pricing and Investment in Electricity Supply (MO-45-ECD).

This and the following proposal raise real questions about the availability of the key staff member, Mr. Anderson. The problem is to provide sufficient funds to make optimal use of his time. Part of this study consists of the completion of two joint papers by Anderson and Turvey; the remainder is for further work on investment planning and pricing. The request for funds does not distinguish between these two elements. Most of the consultant costs are for the fees of Turvey. The question is whether Turvey should be carried as a departmental consultant rather than by the study, since part of his duties will consist of reading and review of work of the division, as well as advising and comment on questions that arise during operation; in our view, this should not be supported by the research budget. The Panel recommends \$10,000 for completion of two ongoing studies. Further allocations should depend on clarification of Turvey's role, on availability of supporting staff, and preparation of more specific research proposals in this important area.

g. Village Electrification (VHO-53-ECD). Part of this is ongoing: Phase I is a comparative study of 20 countries and has produced a large amount of questionnaire data which is now being analyzed. A first draft report is expected in August 1972. Approval of \$10,000 requested for follow-up research should be postponed until the report on Phase I is reviewed. Another part of the study (Phase II) is to concentrate on more specific cost/benefit questions, by means of a pilot study in El Salvador. This study is now being organized. Mr. Selowsky (Harvard) and local university consultants are to participate. The panel recommends allocating \$30,000 (plus travel) to this important study.

HGvanderTak/NCCarter/OYenal:lfb
May 26, 1972

OFFICE MEMORANDUM

TO: Mr. A. Ray

DATE: May 16, 1972

FROM: J. J. Warford *JW*

SUBJECT: Research Proposal and Status Report: Village
Water Supplies

As requested, I attach amended versions of Part IV and Annex I of the research proposal submitted to you on April 11, 1972. The data are now consistent with those in the status report submitted in response to Mr. Stein's memorandum of April 28.

JJWarford:pjk
IBRD

PART IV

BUDGET

1. Budget Unit to be charged: Department # Public Utilities Project Division # Office of Director

Item	FY <u>73</u>		FY <u>74</u>		FY <u> </u>		T O T A L	
	Amt	\$	Amt	\$	Amt	\$	Amt	\$
2. Staff (manmonths)	4		4				8	
a. Professional	2		2				4	
b. Special Services								
Total	6		6				12	
3. Consultants (manmonths & \$)	6	15,000	6	15,000			12	30,000
a. Senior Researcher @\$2500/mo*	11	15,000	11	15,000			22	30,000
b. Researcher @ \$1400/mo*								
c. Res. & Cleric. Asst.								
Total		30,000		30,000				60,000
4. Travel (mantrips & \$) <u>1/</u>	4	12,000	4	12,000			8	24,000
5. Data Processing <u>2/</u>								
a. Inhouse								
b. External								
Total								

*Use this cost estimate when actual costs are not known.

1/ Use Annex I to develop travel cost estimates. Figure staff and consultants together. All travel is charged to Department's Travel Budget.

2/ Use Annex II to develop data processing cost estimates in collaboration with the Computing Activities Department.

TRAVEL COST ESTIMATES

FY	Number of Travellers	From	To	Travel* Costs	Days in Field	Expenses*	Trip Costs
73	trip a. 2	Washington	S. America	3,000	30	2,000	\$ 5,000
	" b. 2	"	Africa, India				
	" c.		Far East	5,000	30	2,000	7,000
	Total man-trips:						\$12,000
	trip a. 2	Not known	Not known	3,000	30	2,000	\$ 5,000
	" b. 2	"	"	5,000	30	2,000	7,000
	" c.						
	Total man-trips:						\$12,000
	trip a.						\$
	" b.						
	" c.						
	Total man-trips:						\$

*Refer to P&B Table of Standard Travel Pricing.

OFFICE MEMORANDUM

TO: Mr. Ernest Stern

DATE: May 8, 1972

FROM: J. J. Warford *JW*SUBJECT: Research Proposal - Public Utilities Projects

This note refers to your memo of May 4, 1972. We have already submitted our response to your memo of April 28. Plans for the two on-going research projects you refer to are as follows:

1. Property Values and Water Supply Benefits

The work is expected to be completed by September 1972. We have no firm plans at the moment for further research in the area.

2. Village Water Supplies

The survey of the existing state of knowledge in the area should be completed by September: a first draft is expected in July. This draft pinpoints the factors that are apparently of the greatest importance in determining the success or otherwise of rural water supply programs. This should be followed by examination of actual programs in the field by the consultant economist currently employed. This will probably be followed by more detailed studies, employing a number of water engineers and health experts in order to ascertain ways in which the alleged benefits of village water supply programs can best be achieved. This work could take another two years.

JJWarford:pjk
IBRD

cc: Mr. Armstrong
Mr. Berrie
Mr. Morse
Mr. Shipman

Mr. A. Stevenson, ECD

May 4, 1972

Ernest Stern

Research Proposals: Public Utilities

We have received the following three proposals:

- (1) Pricing and Investment in Electricity Supply
- (2) Analysis of Cost Structure, Pricing and taxation in telephony
- (3) Village Electrification.

All three projects are continuations or extensions of existing activities rather than new projects. Before processing them we shall need the status reports requested in my memo of April 28 on the Bank Research Program. Two of the three projects, requesting "total of \$82,000 of scarce research funds, provide almost no descriptive material, while that for the third (over \$100,000) is inadequate.

Village Electrification

Phase I seems to be completed and Phase II has been started. The originally envisaged Phase III (cost-benefit studies in more countries) has been postponed because of staff limitations. In its place a list of possible additional studies is suggested (para. 4) for which \$32,450 is requested. There is no justification except that the topics are "worth studying".

Before this proposal can be considered we will need to know

- . the scope of our interest in village electrification. Undoubtedly additional topics of interest will emerge as work progresses. How much research will we do on this subject, in what time frame, and for what purpose.
- . Why staff considerations require postponing additional cost-benefit studies but permit new studies.
- . A more thorough description of the studies proposed in para. 4, including a description of the methodology, their relative importance and their inter-relationship (i.e. must all be done or can some be done without the others.)

~~V-B~~
3

PART I IDENTIFICATION

1. Title: Village Water Supply
 2. Sponsoring Department: Public Utilities Projects Department
 3. Staff Member Responsible: J. J. Warford
 Department: Public Utilities Projects Division: Office of Director
 4. Research to be done: Internally ☐ Externally ☐ Both ☒

PART II PROJECT SUMMARY (attach full details as indicated in Instructions)

1. Problem to be analyzed: Measurement of costs and benefits of village water supply and the investment criteria to be used for evaluation of village water supply schemes.
2. Proposed research method: 1. Review of previous work in this field to help define objectives and scope of study.
 2. "Ex post" evaluation of the costs and benefits of a wide cross-section of completed village water supply schemes in selected countries.
3. Purpose: a) Establish factual or conceptual basis for Bank policy ☒
 b) Support Bank operations in particular sectors ☒
 c) Increase knowledge of the basic development process ☒
 d) Develop institutional capacity for research in LDC's ☒

PART III BUDGET SUMMARY

Budget unit to be charged: Department: P U T P / Division: Water I & II

	Through Current FY	FY 72	FY 73	FY 74
Professional Staff (estimated man-months)	-	3	3	3
Special Services Staff " "	-	3	3	3
FY Totals:	-	6	6	6
Consultants' Fees (\$000)	-	35	35	35
Travel (\$000)	-	10	10	5
Data Processing (\$000)	-	5	5	5
FY Totals:	-	50	50	50

PART IV APPROVAL

Sponsoring Department Approval: *Inhulene* Date: *June 1/71*

Research Committee Approval: Date:

Project Number (to be assigned by Research Committee)

PROJECT DESCRIPTION

Cost/benefit study of village water supply

Researchers

Bank Staff: J. J. Warford, Public Utilities Projects Department
A. N. Other, Public Utilities Projects Department
A. N. Other, Agricultural Projects Department
A. N. Other, Special Projects Department

Consultants: The consultants for the external part of the study will be engaged when the internal part (review of literature and previous work on the subject) has been completed.

Previous work To the Department's knowledge, no work has been previously done on this subject either inside or outside the Bank.

Description of work

Internal The internal part of the study would consist of a thorough review of any literature on the subject and the work already carried out by other agencies plus the collection of available data.

External On completion of the internal review, terms of reference would be drawn up for a study by outside consultants of the costs and benefits of completed village water supply schemes, with a view to establishing criteria for investments in such schemes, and the rationale for determining the claim of village water supply on scarce resources. For this purpose a wide cross-section of villages with public water supply would be selected for study in a reasonably representative group of countries.

Contribution to Bank research objectives

The proposed study would provide a factual basis for Bank policy in the field of village water supply and provide essential support to its operations in the water supply sector, where proposals for village water supplies are becoming an increasingly common feature of borrowers' development programs. The study should also provide useful insights into the basic development process in rural areas.

A further dimension is added by the project in that it is part of an overall package of research work being proposed by the Projects Departments dealing with costs and benefits of rural (as distinct from urban) development. A research proposal for studying village electrification is also being put forward as a separate project.

OFFICE MEMORANDUM

TO: Mr. B. B. King

DATE: August 8, 1977

FROM: Rachel Weaving *RW*SUBJECT: Megalophony Syndrome

This strikes me as an editing problem. If there is a real desire to communicate with non-specialist readers then for some books it may indeed be necessary to delay publication to allow thorough editing, or rewriting by an editor with access to the author.

I don't know how much or what sort of editing is customary for Bank publications at present, or whether the editors have difficulty enforcing their decisions. The Preface of Village Water Supply says it has been edited. The writing belies this (uneven, graceless, unduly complicated) but it isn't just vacuous: most of the time the authors do seem to know what they want to say. Indeed, it compares very favorably with much of what's produced in the Bank for internal consumption, in which writing is sometimes a substitute for thinking (and clarity equated with dilution, to quote a phrase). Editors accustomed to work of this latter sort may be disinclined to rewrite Village Water Supply, unless they have encouragement. Moreover, it will be especially hard for an editor to insist on clarity and simplicity of expression if the author's colleagues/peers have assured him that the manuscript is fine, and perfectly comprehensible to them, since these are quite normally the only people whose judgment he really cares about.

Since I don't know how Editorial Committee works, this suggestion may be inappropriate: apologies if so. Does the Committee ever approve a badly written book "subject to being edited, or rewritten by editors", and appoint one of its members to read it (or parts thereof) after the editing has been done, for a final judgment? If there were an obvious concern for good writing, manifested through a system like this, I think it would encourage editors to do a proper job and authors to cooperate with them. (In the long run, people might write so beautifully for fear of being edited that all the editors could go home.)

RWeaving:tqr

OFFICE MEMORANDUM

File 0-37 JUL 15 1977

B. King (o/r)

TO: Mr. Chenery and Mr. Baum

DATE: July 15, 1977

FROM: William Clark *W.C.*

SUBJECT: Megalophony Syndrome

There are lots of ripostes to this but I feel it is
evidence of a real problem about Bank publications.

The blame ought to fall on my shoulders and I would like to ask your advice about how to remedy the situation. Should there be more editing by generalists? Rewriting by editors? Slower publication with more work by the authors? What?

Please comment to W.C.
ABC

WDClark:sf
cc. Messrs. Merriam
Svikhart

2 Legality reviews

Will it be read?

Village Water Supply, Economics and Policy in the Developing World by R. J. Saunders and J. J. Warford; A World Bank Research Publication; The John Hopkins University Press, London, 1976. Price £10.50 cloth, £4.80 paper, pp279.

Few development sectors have greater potential for directly benefiting the living conditions, health and eventually, the productivity of large numbers of people than water supply improvement. Few will have a greater impact on environmental improvement than those concerned with the proper collection and disposal of liquid wastes, the opposite side of the coin to water supply. It is only in the last ten to fifteen years or so that enough knowledge has been acquired to begin the decision-making process which will lead to the appropriate investment and other actions for the optimum development of the Water Supply Sector as a whole (see "Water Supply and Sewerage" a World Bank paper published in October, 1971 in the "Sector Working Paper" series). Also most investments in the Water Supply (and Sewerage) sectors have so far been in the urban rather than the rural areas. This is because it is only in urban areas that there is sufficient concentration of people to allow the "normal" rules of economic, financial, technical, institutional and organisational viability to be applied.

In the case of rural development, however, it is difficult to ignore purely "social" factors, for rural development is a strategy designed to improve the economic and social life of a specific group of people—the rural poor. It involves the extending of the benefits of development to the poorest among those who seek a livelihood in the rural areas. There are thus strong social-type benefits which are very difficult to quantify, yet quantified these must be (however roughly), if those who control the decisions and the purse strings are to be convinced of investing in rural areas. Despite the considerable numbers of tables, there is very little in the way of "hard" digested numbers. Rather the reader is treated to a compendium of ill-digested material, which he finds difficulty in knowing how to use,

eg, he is told about health benefits but not how to use them. It could be, of course, that one could not expect the book, which could claim the privilege of having a research basis for its work, to be other than a discussion document. Yet this does not stand up to scrutiny, because it claims at its very beginning to enable others (of varying disciplines) to be able to tackle more readily the difficult problems of the justification of village water supply projects.

Perhaps the most difficult thing to swallow is the claim (which is at the heart of the book) that, whereas in urban areas willingness-to-pay can be used directly to give a measure of the benefits, this cannot be so in rural areas and, therefore, everything is based on social (usually health) unquantifiables. A good deal of the *raison d'être* for the book relies on this premise, and a closer look at it brings it very much into doubt.

Even if it is to be granted that justification of village water supply projects must depend upon the quantification of social (especially health) benefits, then the approach in the book reviewed seems to be unbalanced. What is not clearly given is a proper (however rough) relationship between level of infection of disease, level of incapacity to work and loss of ensuing output.

Having said all this, it is very agreeable to find that the World Bank Group, in collaboration with the Inter-American Bank and the World Health Organisation, is making public their findings from their research programme. No one but such a Group can cover such a wide aspect of the problems of development. What would now seem to be required from the World Bank Group is to carry out individual case studies and publish the well digested results from them, on the lines of case studies in the Book *Electricity Economics* by Dennis Anderson and Ralph Turvey, recently published by the World Bank. It might also be as well to include a number of general sections in any new book, which would tie together the individual aspects into a more coherent whole, as has also been done in *Electricity Economics*.

T.W.B.

Village Water Supply, Economics and Policy in the Developing World.

This book is a consideration of the problems encountered in the improvement of water supply to villages in the developing countries. The authors set out their aims as follows: "Because the technical issues are fairly straightforward and well understood, this study emphasizes the economic, social, financial and administrative issues characteristic of village water supply and sanitation programs and makes policy recommendations accordingly."

This surely is a subject of great social importance, and what with the impressive sponsorship and the high qualifications of the authors one is encouraged to expect a work of value and interest. Alas, one is disappointed. The writing can only be described as atrocious, a severe case of the megalophony syndrome which seems to afflict sociologists and economists particularly and in which jargon, prolixity and verbal aggrandizement are thought, or are hoped to indicate intellectual profundity and erudition. One could take examples of this out of every page of the book, but the following from p52, which occurs under the heading *Which way to proceed* will serve as well as any:

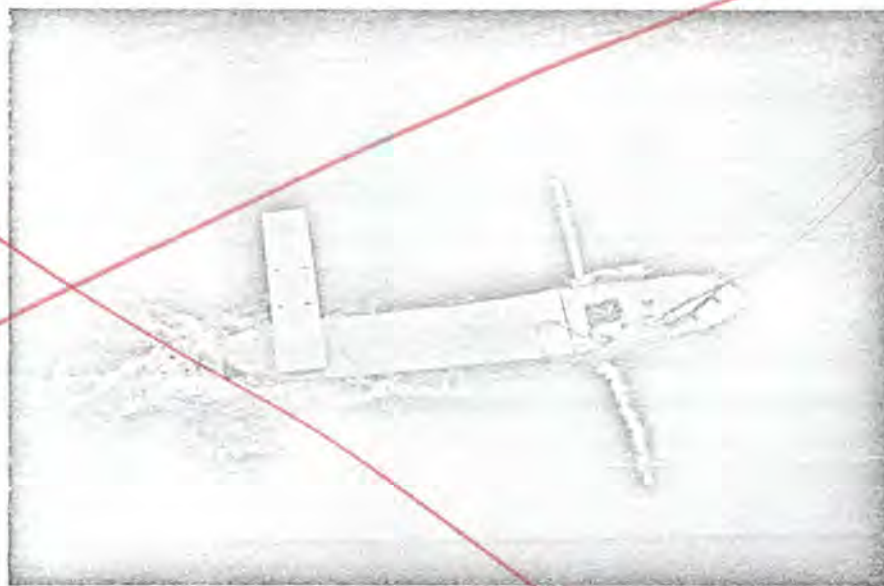
"With specific reference to (rural) water supply systems and sanitation programs, the factors which should be considered in benefit evaluations of better health are also the subject of some discussion. A set of guide lines, however, can be developed. Although it is imperfect, the most workable way, in general, to place a minimum value on the probabilistic improvements in the health of a population (assuming these improvements can be predicted) seems to be through discounted changes in potential or expected earnings. Discussion on this subject is somewhat involved . . ."

One would not begrudge the labour involved in interpreting the text and unravelling the mutilated syntax if the reward were enlightenment and valuable practical advice, but the book is tiresomely inconclusive, the authors seeming only to pose the questions and not to answer them except by reference to previous work

(Continued on page 57)

across the top and bottom of the cylinders will be different by twice the axial speed. As a result of the velocity differences there is a corresponding change in fluid pressure, and the cylinder will be subject to a vertical force. This will be up or down according to the direction of axial and rotational movement.

This effect has been used by W. G. Edwards, a lecturer at the Institute to control the vertical movement of a prototype fish. Cylinders projecting from the hull, at right angles to it, and on either side of it, are driven by an electrically controlled motor. The horizontal motion is imparted to the fish by the towing vessel, and its vertical position is controlled simply by rotating the cylinders in one direction for upwards movement, and in the opposite direction to go down. This facility obviates the need for winches on the towing vessel and will also allow the depth of the fish to be controlled far more precisely than at present. The rotational force also



has a gyroscopic effect, and tends to stabilise the fish underwater.

A further refinement that is being investigated, is the possibility of using a separate motor for each

cylinder, allowing them to be driven at slightly different speeds. This should result in a rolling effect, that is, the ability to move right or left in addition to up and down.

book reviews

(continued from p55)

from other sources. Indeed the most valuable parts of this book are the appendices which contain summaries of the findings of many workers in this particular field, and the bibliography which is 23 pages long and contains about 360 references.

A great deal of space is taken up with tables and diagrams some of which seem to be superfluous and some of these to have been put in merely because they look good and add to the scientific appearance of the book.

The determination to aggrandize the simplest issue leads sometimes to laughable pomposity as in the following footnote to a section headed *The Health-State Approach to Project Evaluation*: "Anyone who has recently had a toothache, which would seem to place him in the discomfort category, might argue that the exponential weighting function does not effectively separate him far enough from the perfect well-being score of 1000." If that is intended to be funny, as one must hope it is, it

is the only example of intended humour in the book. In any case it provides an excellent illustration of the pretentious and inflated style of the whole work. Perhaps this book will serve to enhance the benevolent image of the World Bank, but as to whether it will be of practical value to those actually engaged in the provision of water to primitive villages the answer must be highly improbabilistical. J.B

* * *

Editor's Note

Village Water Supply is typical of many books received by this journal, dealing with social and economic aspects of water control and supply. It falls into a general rather than specialist category, as it does not deal with mechanics or engineering techniques, but with a less specific subject, and is therefore addressed to a wider audience than specialist books.

Because the subject is important, we took the unusual step of asking two people to review the book inde-

pendently, one a specialist in the field and the other a well-read layman. The two reviews we received are illuminating both for the book in question, and many others like it. It appears to be, in the view of our layman, pretentious, pompous, long-winded and turgid—in fact unreadable.

The specialist reviewer also had his doubts, referring to "ill-digested material" although he was better able to assess its content, and discuss its validity.

We leave our readers to draw their own conclusions, but throwing aside for the moment the cloak of editorial impartiality, it seems a waste of effort, energy and materials to assemble useful material that is difficult if not actually painful to read. Books intended for a readership which embraces more than specialists and engineers should be written lucidly and cogently, otherwise they are without merit or justification.

No matter how good a letter is, if it's in a badly-addressed envelope, it is unlikely to reach its destination.

Mr. Orville Grimes, Development Economics

September 25, 1975

H. R. Shipman, Water Supply Adviser

Public Utilities Department

Research - RPO 237 (Village Water Supply) - Evaluation

As agreed during the recent meeting on evaluation of the above project, my comments on this project are as follows:

1. I have polled the regional water supply division chiefs in connection with a number of items relating to this project and replies have been received from three at the time of this writing. A tabulation of the results is shown as an attachment. The consensus would appear to be that all of the division chiefs were aware of the study; that all had read the report; that only part of the staff have read the report; that only one of the three felt that the study has conveyed benefits in the course of activities over the past year; and that two of the three felt that the findings would be of value in the course of future work. Two of the three divisions had not made copies of the report available to outside agencies. Two of the three did not feel that there would be any merit in making copies of the report available to personnel outside the Bank. Two of the three felt the study was justified. Only two responded to the question as to whether the study brought any new information to bear on the subject. Each of these two felt that it did not. In summary of the above I would conclude that because most of the division chiefs have had experience in the rural water field the findings and conclusions of the study did not add anything particularly new to what they already knew from experience. At the same time I believe the consensus is that for others it would serve a useful purpose.
2. The paper has served as a basic document in permitting those who prepared the Bank paper "Issues in Village Water Supply" to support conclusions which they had reached based on their own experience. For the first time there was a consolidated review of the literature on the subject of benefit measurement and which continues to have usefulness.
3. Very complimentary remarks have been returned to the Bank from a number of workers at universities and institutions along the lines of this being the best source of information, broadly, that they have encountered for summarizing the literature on studies done in the benefit/cost line on water supply.
4. The report of the study served both the Ad Hoc Panel on Rural Water Supply which has been looking at the question of international stimulation of activities in the field of rural water and it also served the expert panel which the Bank convened this spring to look into the general question of health benefit measurement from water supply investments.

5. I would join the division chiefs in concluding that further areas for research coming out of this study are not immediately evident. Those which do come out would probably have been identified by other means and I would therefore feel that the study was not a major mechanism for uncovering these. The one point I believe should be stressed in this connection, however, is that the report clearly identifies the problems associated with measurement of health benefits and what appears to be the shortcomings of previous studies in being able to reach conclusions. To this extent it has a tempering influence on those who might rush into such studies without benefit of the words of caution which come out of the study.

6. I believe the report was responsive to the terms of reference.

7. On implementation factors, I believe the work went smoothly, was reasonably on schedule, and that the quality of consultant and the form of presentation are of a very high order.

8. There has been a wide-ranging interest in the report and our records show that between three and four hundred copies have been sent out. A record is available on all of the agencies, governments, universities, and consultants, but this roughly breaks down into eight international agencies including the bilaterals, the regional banks, Church World Services, the Indian Commerce Research Bureau and the Center for Disease Control of the US Government in Atlanta. Sixteen copies of the report have been sent to foreign universities and six copies to engineering consultant firms.

9. I believe the study was fully justified and that the results, while not opening up major new areas for exploration, have presented a sound picture of the world rural water situation and one which has served a useful purpose in backgrounding those without familiarity with the problems and approaches encountered in rural areas in the field of water and wastes. I would expect that we will continue to receive numerous requests for the publication and that little change in the conclusions reached will occur over time.

HRShipman:j

Messrs. Erkmann, Kalbermatten, Ribl,
Thys and Williams

September 19, 1975

H. R. Shipman, Water Supply Adviser
Public Utilities Department

RPO 237 - Village Water Supply and Sanitation in LDCs - Evaluation

You will recall that approximately one year ago a research project carried out by Mr. Robert Saunders and Mr. Jeremy Warford on Village Water Supply and Sanitation in Less Developed Countries was completed. The research committee of the Bank, in response to comments made by the Executive Directors after their review of the Bank's research programs, is undertaking an evaluation of certain completed projects. The Village Water Supply and Sanitation project, having been completed for approximately a year, is one which they have identified for evaluation and have asked Mr. Rajagopalan to head a small task force to carry out this work. As a member of the task force I would like certain information from you based on the experience in your region over the past year since completion of the research project. I have listed on the attached sheet a number of questions which I believe would give answers to a number of the points which the research committee wishes addressed. A consolidation of the findings and conclusions of the study are presented in P.U. Report No. RES 2 entitled Village Water Supply and Sanitation in Less Developed Countries dated March 15, 1974. This is an abstract of a much larger volume but contains all of the essential material and in the event that you need to refresh your memory you may wish to look at the document. Copies are available from Miss Peter of this department (x 5459) in the event that you need additional ones for reference. Since the task force has to have my contribution by September 29, I would appreciate return of your questionnaire in the next two days. Thank you.

Attachment

HRShipman:j

Questionnaire

1. Were you aware of the study and of the report? Yes ☐ No ☐
2. Have you read the report? Yes ☐ No ☐
3. Do you believe that most of your water supply staff have read the report? Yes ☐ No ☐
4. Have the findings of the study as conveyed in the report been of any benefit to you and your staff in the course of your activities over the past year? Yes ☐ No ☐
5. Do you believe the report and findings will be of any value to you in the course of future work in your division? Yes ☐ No ☐
6. If the answer to the above is yes, in what ways would you expect the results to be of value? _____

7. Have you had any occasion to make copies of the report available to outside agencies ____, officials from LDCs ____, others ____, none ____?
8. Do you believe that in the future it will be of value to make copies of this report available to personnel both in the developing countries and outside? Yes ☐ No ☐
9. As a general observation, do you believe that this study was justified? Yes ☐ No ☐
10. Did it bring any new information to bear on the subject which you feel justified the work and expense? Yes ☐ No ☐
11. If the answers to the previous questions were generally in the affirmative, are there any aspects which you think should have received additional attention or which would lend themselves now to any further study? _____

VILLAGE WATER SUPPLY AND SANITATION IN LESS
DEVELOPED COUNTRIES: RPO 237

Public Utilities Department

Background

The major difficulties in village water supply and sanitation programs are not technical, but rather administrative and financial. The problems are in large part due to the relative poverty of rural communities, their failure to make proper use of potable water, and relatively high cost per consumer of village supplies as compared with urban supplies, the encumbered administration stemming from geographical dispersion and the common neglect of operation and maintenance due to the lack of proper allocation of budgetary resources, the lack of on-going technical assistance, and the lack of administrative attention.

Objectives and Methodology

The purpose of the study is to measure the costs and benefits of village water supply and the investment criteria to be used for evaluation of village water supply projects. The research effort includes two components. The first is a thorough review of literature on the subject and the work carried out by other agencies plus the collection of available data. The second component consists of an analysis of the operation of village water supply projects in a number of less developed countries. Particular attention will be paid to the factors which are significant in determining the likelihood of success or failure of village water supply projects and the priority in national development planning. The problems of identifying and quantifying the benefits of investment in this field are also explored.

Staffing

J. J. Warford, a Bank staff member, and Robert J. Saunders, consultant, are the principal researchers.

Schedule

The study has been completed. The final report was published in March 1974.

Reports and Publications

R. Saunders and J. Warford, "Village Water Supply and Sanitation in Less Developed Countries", Public Utilities Report No. RES 2.

670.37

Completion Report