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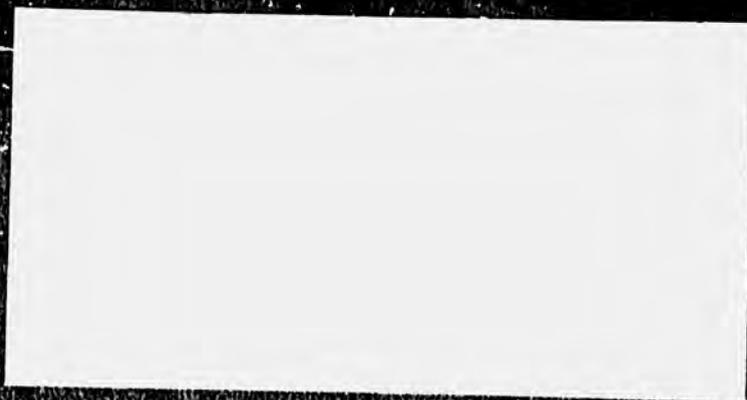
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**A REVIEW OF
HEALTH, POPULATION, AND NUTRITION ACTIVITIES
IN THAILAND**

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ABBREVIATIONS

APHA	American Public Health Association
BCG	Tuberculosis Vaccine
CDO	Community Development Officer
CFC	Child Feeding Center
CID	Central Information Division (MOPH)
CNC	Child Nutrition Centers
DMPA	Depo Provera (Injectible Contraceptive)
HPN	Health, Population, and Nutrition
IE&C	Information, Education and Communication
IUD	Intrauterine Device
MOAC	Ministry of Agriculture and Cooperatives
MOPH	Ministry of Public Health
NFPP	National Family Planning Program
ORS	Oral Rehydration Salts
PEA	Provincial Electrical Authority
PGR	Population Growth Rate
PHC	Primary Health Care
PWWA	Provincial Water Works Authority
RTG	Royal Thai Government
RWSD	Rural Water Supply Division (MOPH)
TBA	Traditional Birth Attendant
USAID	United States Agency for International Development
VHC	Village Health Communicator
VHV	Village Health Volunteer
VSC	Voluntary Surgical Contraceptive
WHO	World Health Organization

I. EXECUTIVE SUMMARY

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The Royal Thai Government (RTG) has made a substantial investment in the period 1977-1981 toward extending the provision of primary health care to villages under the Accelerated Family Planning and Health Project. However, this project has not yet been systematically evaluated to determine the project's impact and the villages' use of services. Furthermore, no effective system for providing the timely information needed for managerial and health planning decisions has been established.

Several deficiencies in the delivery of primary health care are apparent. Coverage of the rural population by government health and nutrition services is incomplete, and the targeting of services to persons in greatest need is not effective. One reason is that the midwife, who usually cannot cover all the villages in her service area, is expected to monitor health and nutrition status and to provide services. Health and nutrition problems must be identified at the village level, but the effectiveness of village health volunteers has been questioned. There are two major constraints on their performance: tasks have not been defined clearly and specific priorities for action have not been set. Tasks and priorities should be reassigned so that outreach and monitoring are done in the village and so that the midwife has adequate time to supervise village health workers. Responsibilities must be limited and clearly defined. Such action would strengthen the role of the village health volunteer.

Malnutrition among infants and children continues to be a serious national problem. The present Ministry of Public Health (MOPH) program emphasizes nutrition education and the provision of free processed supplementary foods to the malnourished. However, supplements have generally been ineffective because the supply is too limited to meet overall needs, and because the MOPH budget does not allow for the purchase of additional supplies. Food supplements often fail to reach many malnourished children because of poor outreach and targeting; there is also evidence that food supplements are often used as substitutes, not as supplements, for family food. Further, food supplementation is primarily curative; it does not effectively promote a change in the family behavior which contributes to malnutrition. Nutrition education has not been directed specifically to those who need it; it focuses mainly on the provision of information, and not on changing behavior.

This report recommends the early identification of infant and preschool malnutrition by regular weighing in the villages and by targeting education and available food supplements to the already malnourished and to those at greatest risk. Growth charts should be used routinely, both for prompt nutritional classification of children and to motivate mothers. Reliance on the food supplements supplied by the MOPH should be reduced, and targeted education focusing on improved home food production and purchasing patterns should be stressed. Education should be based on behavioral objectives. Its effectiveness should be evaluated in the same terms. Village health volunteers should identify pregnancies early and should provide nutrition education, as well as referral, to the

MOPH midwife for tetanus immunization and other prenatal care. Village health volunteers should be systematically trained and supplied to treat severe childhood diarrhea with oral rehydration salts (ORS).

The RTG has endorsed the objectives of the International Drinking Water and Sanitation Decade to provide access to safe drinking water and sanitary excreta disposal by 1991. The solutions proposed for rural villages by the World Health Organization (WHO) consultant to the MOPH include shallow wells with handpumps, rainwater cisterns, deep wells, and piped-water systems. This report recommends that USAID specifically support village-level piped-water systems, since only these systems can provide the increased quantities of water that existing research has shown to be a necessary condition for achieving substantial health benefits at the village level.

The impact of past efforts to reduce population growth in Thailand is impressive. New efforts should build on those of the past. However, since the mere continuation of current programs may not be sufficient to reach the ambitious target of a 1.5 percent population growth rate by the end of the Fifth Five-Year Plan (1986), this report recommends that USAID funds for intensive research be used to determine the reasons for variations in the effectiveness of the National Family Planning Program (NFPP) in different areas of the country. It further recommends the use of the findings of such research to guide efforts in lagging areas. This report also recommends that the RTG increase its share of funding for the supply of contraceptives as USAID funding for commodity purchases and for sterilization subsidies is gradually being reduced.

The two specific programs that are recommended, village-level nutrition and piped-water supply services, should be integrated to ensure maximum impact. While each program can make substantial contributions to improved health status and village development, the two together will provide a total benefit that is greater than the sum of each project's independent contributions. In addition to its uses in sanitation, water is a resource which can be used to increase rural home food production and to generate additional income.

None of the current programs of the MOPH that were examined by the consultant team have data systems that provide the information needed to manage the programs effectively or to assess their impact. The MOPH should review the existing system of data collection and analysis to determine the utility of the data produced. USAID should provide funding for a review of current data systems and to improve the capability and competence of MOPH data systems to provide useful management information.

Information from the existing data systems should be supplemented by short-term operational research studies. USAID should assist in establishing a new center to design and carry out studies directly related to operational problem-solving and improved management of existing programs.

**II. OVERVIEW:
HEALTH, POPULATION, AND NUTRITION SECTOR**

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This report is an assessment of the validity and potential effectiveness of the proposed FY 1982 project activities included in the USAID/Thailand Health, Population and Nutrition Needs Assessment of May 1980. The USAID/Thailand document, using Royal Thai Government data, reflects an attempt to assess the effectiveness of existing delivery mechanisms for health, population, and nutrition activities. Based on the findings included in this paper, several specific activities were recommended for FY 1982 project development. These recommendations correspond to the three priority areas designated by the AID/Washington Asia Bureau Health Sector Assessment. These three areas are:

- o Reduction in Infant and Child Mortality
- o Reduction of Population Growth
- o Increased Life Expectancy

The goals of the Royal Thai Government and the Asia Bureau are complementary.

During the consultant team's recent discussions with RTG planning bodies and representatives, interest was expressed in developing USAID-assisted projects in population, nutrition, health education, and water and environmental sanitation. The RTG indicated its interest in initiating new project activities in the north-eastern region of Thailand whenever possible. Regionalization would be particularly relevant for nutrition and water/environmental sanitation efforts. The RTG also expressed specific interest in receiving support for programs that are larger, in size and scope, than "pilot projects" and that can be replicated in other areas.

Health

The public sector health delivery system includes a network of service outlets. These include:

- o Provincial Hospitals: 92 in all, at least one located in each of the 72 provinces
- o District Hospitals: 288 located in 697 districts and subdistricts
- o Tambon Health Centers: 4,165 located in 5,745 tambons
- o Midwifery Centers: 1,674 located in 5,745 tambons
- o Village Health Volunteers: 14,142 located in 51,635 mubans
- o Village Health Communicators: 100,871 located in 51,635 mubans

Professional health workers (doctors and nurses) are deployed in both provincial and district hospitals. Paramedical workers (midwives and sanitarians) are deployed in tambon and midwifery centers. Non-professional (volunteer) health personnel are selected and trained in villages throughout the country. The 20 provinces included in the Rural Primary Health Care Expansion Project have been targeted for special attention.

The public sector health system serves about 15 percent of the people in Thailand, providing curative, preventive, and promotive health interventions. The remaining 85 percent of the population seek care in the private sector, primarily at pharmacies or other drug outlets. The major emphasis in both the public and private health systems is curative medical care. One major exception is the nationwide immunization program, which reports overall coverage rates of about 50 percent for smallpox, DPT, and BCG. MOPH midwives in rural areas are active in prenatal and postpartum care programs, and well-baby activities are undertaken in selected areas. Approximately 30 percent of all deliveries take place in MOPH facilities. Sanitarians are active in various environmental sanitation activities. However, 62 percent of the people in Thailand do not have access to sanitary excreta disposal facilities (privies), and 80 percent do not have access to safe drinking water.

At this time village health volunteers (VHVs) and village health communicators (VHCs) serve as conduits for public sector information, education, and communication (IE&C) campaigns. In general, they do not target specific curative, promotive, or preventive health interventions. Three exceptions to this generalization are the volunteers' distribution of simple non-prescription medical treatments, the distribution of family planning supplies, and the limited distribution of oral rehydration salts.

Population

Thailand currently has a crude birth rate of 29.9 per 1,000 population and a crude death rate of 7.9 per 1,000. As of 1979, the annual population growth rate was 2.2 percent; it was 3.2 percent in 1970. Prevalence of contraceptive usage was 52 percent in 1979, and knowledge of contraceptive practices nationwide was 93 percent.

The practice of family planning includes the following methods and percentage of users:

<u>Method</u>	<u>Percent of Users</u>
Oral Contraceptives	59.1
Female Sterilization	13.3
DMPA (Injectable)	11.3
IUD	7.5

<u>Method</u>	<u>Percent of Users</u>
Condom	5.2
Vasectomy	3.4
Other	0.2

The primary distribution network for family planning services is in the public sector. The Community Based Family Planning Services is the organization most involved in private sector family planning activities.

During the past three years, AID involvement in the family planning program has focused on three major areas: oral contraceptive supply, reimbursement (subsidy) for voluntary sterilization, and limited training activities in sterilization methodology for health professionals and paramedical workers.

The Royal Thai Government has set a population growth rate (PGR) target of 1.5 percent by the end of the Fifth Five-Year Plan (1986). To reach this goal, the RTG must maintain sufficient contraceptive stocks to supply continuing users and to prevent program dropouts, as well as to attract a significant number of new acceptors. The mere availability of contraceptive supplies and services will not ensure achievement of the 1976 national goal. Aggressive marketing and motivational strategies must also be used.

Nutrition

In recent years, the prevalence of malnutrition among preschool children in Thailand has climbed to 57 percent nationwide. As based on a sample survey of 260,000 preschool children which the MOPH conducted in February 1980, the figures reported for normal nutrition and first-degree, second-degree, and third-degree malnutrition are as follows:

<u>Type of Malnutrition</u>	<u>Percent</u>
Normal	42.68
First Degree	40.84
Second Degree	14.29
Third Degree	2.19

Although supplemental foods are being distributed to severely malnourished children through the public sector (MOPH) health system, they have not been effective in reducing the prevalence of malnutrition. The supplemental feeding program, as presently structured, is experiencing difficulty with supply, with household supervision (allowing distributed foods to become substitutes rather than supplements), and with identification of target groups of malnourished and

high-risk children. Malnutrition is pervasive throughout the nation. It is particularly severe in the northern and northeastern regions of the country.

In addition to the problems with the MOPH supplemental feeding program, child growth charts are not being used routinely either in village homes or in health centers. Dietary information is limited at the village level, and the early identification of potential cases of malnutrition is not being done regularly. In addition, the problem of malnutrition is exacerbated by the early introduction of indigenous supplementary foods (e.g., rice and bananas), by poor maternal nutrition resulting in limited breast milk availability, and by the non-availability or non-use of oral rehydration salts in villages throughout the nation.

Water and Environmental Sanitation

Approximately two-thirds of all people living in Thailand obtain their household water from open shallow wells. Apart from the obvious danger of contamination, the location of the well is often neither convenient nor adjacent to living quarters, and the water is not always available in sufficient quantity year round, particularly in the northeast. The expanded water supply programs which various governmental departments are supporting concentrate either on covered well-water supplies or on rain catchment and storage facilities. The provision of covered wells does not affect the quantity of water, or its accessibility (convenience of location). Furthermore, one might question seriously whether or not the quality of water is affected when the well is covered, since contamination usually takes place during the transportation or storage of water in the home. Rainwater catchment and storage facilities suffer from similar problems; quantity is also limited by the size of the holding tank and by seasonal variations in rainfall.

During the late 1960s and early 1970s, USAID supported a program to build small piped-water systems in small villages throughout Thailand. These systems served villages with an average population of 800 persons, and construction costs of up to 50 percent were shared by the villagers and the government. Of the 60 systems that were surveyed in 1979, 96 percent were found to be operative and delivering high quality water in high volume to individual households (Dworkin and Pillsbury). Water fees were being collected regularly at an average cost of B3 (15¢) per cubic meter.

Health Education

The Ministry of Public Health includes health education activities in all of its service programs. A particularly active program is being conducted by the population staff in the Family Health Division. Although these health education activities cover a wide range of subject materials, many of the materials

are not well designed to effect behavioral change. The development of more project-specific health education efforts would strengthen the Health Education Division and improve its capability to produce high quality materials for all MOPH programs. In addition, for MOPH health education activities to be effective, they must be more fully integrated into village-level service delivery programs.

Research

The consultant team was particularly aware of the lack of operational health research activities while observing central-level and field programs. The collection and analysis of health statistical information within the Ministry of Public Health need to be further refined and improved. Although the Rural Primary Health Care Expansion Project has received a substantial budget for in-house evaluation and operational research activities, experience to date (during the project period) indicates that all project funds will not be expended for this purpose by the end of the project. If budget funds become available, the team recommends that they be used to strengthen the institutional capability of the Health Statistics Division of the MOPH.

Priorities for AID Programming

The team concurs with the Mission's decision to emphasize as priorities for Health, Population, and Nutrition (HPN) sector activities in FY 1982 rural water supply and the alleviation of childhood malnutrition. In addition, the team proposes ways to strengthen the PHC delivery system at the periphery and to provide prenatal care and wider oral rehydration treatment of childhood diarrhea. These priorities accord with the stated objectives of both the RTG and AID.

There is convincing evidence that malnutrition is the major contributor to childhood mortality, even though other causes are listed in the statistics on reported deaths. Malnutrition-related deaths are often not identified as such and for this reason are often not officially reported. Nevertheless, total childhood mortality statistics and recent data on the prevalence of severe malnutrition strongly suggest that malnutrition-related deaths are common. Therefore, mortality would be affected significantly if malnutrition prevalence were reduced. The team believes that the problem of childhood malnutrition can be successfully addressed using the strategies discussed in this report, and that an improved water supply, which should reduce nutrient losses from diarrhea, improved sanitation, and an increased family food supply will contribute to the success of the effort.

III. MAJOR FINDINGS AND RECOMMENDATIONS

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Rural Primary Health Care Delivery

Under the Fourth Five-Year Plan (1977-1981), the RTG has made a substantial investment in the nationwide provision of rural primary health care and the extensive training and deployment of large numbers of health workers and community volunteers. Special emphasis has been placed on manpower needs and health system innovations in the 20 provinces covered under the Accelerated Family Planning and Health Project (Population Project). One of the major objectives of this project is the increased delivery of integrated basic curative and preventive health services to rural villagers. No systematic evaluation of the effect that this expanded health care delivery system has had on health facility use rates, service delivery, or improvements in health status has been made to date. Similarly, no effective system has been established to monitor the primary health care system and to provide the information needed for managerial and health planning decisions, especially at provincial and district levels.

These deficiencies are of special concern, given the fact that the availability and impact of services vary considerably from village to village.

Recommendations

1. A systematic evaluation should be made to determine the impact of expanded primary health care services on use rates and health status. Where little or no impact is found, information should be gathered to identify and explain clearly the major reasons for this finding.
2. The existing health care data collection and reporting system should be thoroughly reviewed with the objectives of simplifying the system, providing information more promptly, and providing information in a usable form to those who require it.

Three structural features of the primary health care system are potential weaknesses and require continuous review. These are: the long supervisory chain from the Provincial Health Office to village-level activities; the multiplicity of tasks assigned to subdistrict paramedical workers and village health volunteers; and the sociocultural gap between government health workers and the communities which they serve.

3. For health workers at tambon health centers and midwifery centers, as well as for village health volunteers and communicators, a method is needed for assigning definite priorities to the many tasks for which these workers are responsible.

4. Effective and regular supervision throughout the rural primary health care system is needed to ensure the best use of existing resources.

The targeting of services for antenatal and postpartum maternal nutrition and infant feeding has been inadequate. The frequency of low birthweight infants is high and infant feeding practices that are detrimental to normal growth are prevalent. Only 15 percent of pregnant women are receiving tetanus immunization. No systematic effort is made to deliver high-risk mothers, such as those with first pregnancies, in government facilities rather than by traditional birth attendants (TBAs) at homes.

5. All pregnancies should be identified early so that the mother can receive nutrition education for herself and her infant.
6. All pregnant women who are not immune should receive tetanus immunization before they deliver. The goal should be zero incidence of neonatal tetanus.
7. All first pregnancies should be regarded by government midwives as high-risk pregnancies, and a special effort should be made to deliver first pregnancies in government health centers.

The use of oral rehydration salts for treating severe infant and young-child diarrhea is variable and inadequate. ORS packets are not available in many rural health facilities. Where they are stocked, they are not used regularly and aggressively, despite overwhelming evidence that use of ORS can reduce morbidity and mortality.

8. Severe diarrhea in infants and children should be rapidly identified and treated with ORS by all health workers and village health volunteers.

Nutrition

Health and nutrition services fail to reach a large proportion of the population, in part because they are delegated to midwives who do not have time to visit many of the villages served by midwifery centers. The result is that nutrition surveillance (regular weighing) of children does not occur and food supplements and education are not provided in many villages.

Recommendations

1. Nutrition surveillance and simple intervention should be done by a village-level worker, such as the VHV, so that every household is covered.
2. The MOPH should restrict the VHV's activities primarily to those directly related to nutrition and MCH. Specific, well defined tasks should be assigned.
3. Simple protocols for the treatment of malnutrition should be developed for the VHV.

The delivery of health and nutrition services is not sufficiently directed toward high-risk groups. In the area of nutrition, infant and childhood growth charts are used routinely to identify malnutrition and lagging growth.

4. The use of infant and child growth charts should be instituted throughout the rural primary health care system. Two copies should be maintained; one should be kept by the mother and one by the village health volunteer.

The MOPH nutrition program depends heavily on the provision of processed food supplements to malnourished children. This program has been ineffective because of inadequate targeting and insufficient coverage. In the home, supplements are often used as substitutes for regular food and no net increase in consumption occurs. Furthermore, the delivery system from Bangkok is unreliable, and the high cost of gasoline has limited the quantities which can be distributed. Finally, supplements are used only as a curative measure; they do not promote a change in the household behavior which caused the child to become malnourished.

An appropriate low-cost processed infant food that is commercially available would be one alternative for mothers, although its usefulness would depend on its local cost relative to other foods.

5. Reliance on MOPH processed supplemental foods should be reduced. Heads of households with malnourished children should be educated to supplement the diet with nutrient-dense foods available locally from the market or produced in the home.

Many Child Nutrition Centers and Village Feeding Centers have been built and many more are planned. These facilities serve a variety of purposes. They provide day care, distribute food supplements, teach food preparation skills,

and foster community organization and development. However, their programs are not sufficiently targeted to reach all children with second- and third-degree malnutrition, and they are poorly linked with outreach activities.

6. If supplemental foods are used, they should be targeted to children with second- and third-degree malnutrition, and their use should be combined with education and monitoring to ensure that they are used as supplements, not substitutes, for family food.
7. The MOPH strategy of establishing Child Nutrition Centers to improve infant and childhood nutrition should be critically reviewed from a policy perspective. The anticipated cost, coverage, and impact of such centers should be analyzed.
8. Village-level nutrition activities should be targeted to all children with second- and third-degree malnutrition and those who fail to gain weight during two or more monthly visits.

Nutrition education at the village level has been a specific responsibility of the midwife. It has been ineffective because it has not been targeted to those with a demonstrated need for changed behavior. It has focused primarily on the simple provision of information, and not on the establishment of clearly stated and measurable behavioral objectives. The effect of nutrition education has not been monitored.

9. Much of the nutrition education which is provided should be given by village-level volunteers to households with malnourished children.
10. The MOPH Health Education Division should develop, test, and distribute new nutrition education materials. These materials should be simple, specific, and focused on behavioral change.
11. Clear instructions should be given to village workers on how to identify situations in which particular nutrition messages should be communicated.

In a few experimental community development programs, village leaders have been trained as effective promoters of behavioral change. Monks, schoolteachers, village headmen, and members of village and tambon councils often are highly motivated to organize and serve their communities, and they frequently are recognized and respected by the villagers. They could perform additional

important functions. For example, they could become directly involved in health education, assist in nutritional surveillance in the absence of the VHV, supervise and motivate VHVs and other village workers, promote improved food production and food and handicraft marketing, and organize the community to obtain the benefit(s) of private and government services and technical assistance.

12. A study should be made of the feasibility of developing a training program open to volunteer village leaders and providing the knowledge and skills needed to perform community development functions, including health education and health promotion. The program should be offered in a few provinces to determine the magnitude of response from villagers.

Economic development has an important effect on health and nutrition, since increased home food production and income are directly translated into increased family food supply. Economic development requires improved technology of production and improved organization and marketing. To initiate such changes, sophisticated technical knowledge beyond that which can be given in a short-term training effort is needed. University graduates motivated to work in rural areas to benefit their society could readily master the technical information needed to promote economic improvement. At the same time, these socially-motivated graduates could encourage the development of leadership within the village. They could act as an outside stimulus to accelerate the community development process.

13. A program should be established to train selected and highly-motivated university graduates in the necessary skills to promote community economic development. The graduates should be employed in villages for a period of one to two years and receive a minimal stipend. Because the positions would be temporary, international donor funds could be used to support this program. A limited number of such positions should be funded for up to two years. The results should be carefully monitored and used both to evaluate and to determine whether to continue the program.

Village Water Supply

Recently, considerable attention has been given to the delivery of improved water (particularly water for drinking and other household purposes) to rural areas. An alternative approach is to focus on both water quantity and quality.

Water is a high-priority item in rural villages and serves multiple needs. Year-round water availability is highly variable. In areas where clean water is inaccessible or in short supply, increased water availability will, the evidence suggests, provide several benefits: increased use of privies, reduction of food and water-borne contamination and diarrheal disease, increased food production, and reduction in infant and childhood malnutrition. A limited number of small piped-water systems that meter the delivery of abundant potable water to individual households have been used effectively.

Recommendations

1. Small piped-water systems which provide increased amounts of water to individual households should be established in selected rural villages that lack adequate year-round water.
2. Health and nutrition-related uses of abundant potable water should be promoted at the village level.

The Provincial Water Works Authority (PWAA) charges \$1.9 per cubic meter for all systems under its control. This provides a subsidy to users in urban areas. The present rate structure conflicts with the RTG policy of requiring state enterprises to be self-sustaining. It is creating understandable dissatisfaction among users of rural systems who are paying substantially more for their water.

3. Water supply systems throughout the country should be self-sustaining. Disparities in rates should result from differential costs of service, not from differential levels of subsidy.

Population

The MOPH National Family Planning Program has been one of the most successful in the world. It has reduced the population growth rate from 3.2 percent in 1970 to 2.2 percent in 1979. The Fifth Five-Year Plan has set a PGR target of a 1.5 percent by 1986. Current major efforts include: wide availability of voluntary surgical contraception (VSC), with special emphasis on rural areas; ready availability of oral contraceptives; special efforts to expand coverage in provinces with low contraceptive prevalence rates; pilot training of MOPH paramedical workers to provide VSC, IUD, and DMPA services; and intensified IE&C activities. NFPP services are fully integrated into the rural primary health care system.

The MOPH Family Health Division has relied heavily on external donors for commodity support and VSC subsidies. DMPA injections, for which there has been

increasingly heavy demand, are more expensive than oral contraceptives, and DMPA use has been intentionally restricted to control costs.

Recommendations

1. In view of the high priority that the RTG has placed on family planning activities, government support for the cost of contraceptive commodities and services should be increased, and the reliance on external donor support for budget line-items decreased.
2. Special attention should be given to substantially increased DMPA availability to meet user demand.

Current NFPP activities heavily emphasize the use of mobile VSC units in rural areas. Widespread provision of VSC, IUD, and DMPA services at static rural health facilities has been retarded by policy decisions and constraints on the appropriate training of paramedical personnel.

3. The authorization and training of paramedical health workers in peripheral units to provide the most effective forms of contraception, including VSC, IUDs, and DMPA, should be a high priority.

As family planning coverage increases, the yearly recurring costs of NFPP services will also increase. For budget planning purposes, these costs should be systematically weighed against the cost savings realized by decreasing births.

4. Special efforts should be made to present the Bureau of the Budget with clearly delineated future cost savings and other benefits which will result from increased RTG expenditures on family planning activities.

Most MOPH family planning services are now provided free of charge. There is considerable evidence in related private sector programs that valued family planning services will be purchased. As external donor support diminishes, the maintenance of family planning services and a reduced PGR will require increasing consumer purchase, at either full or partial cost.

5. Efforts should be initiated to stimulate increased consumer purchase of expanded MOPH family planning services.

Integrated Village Services

The Fourth Five-Year Plan (1977-1981) emphasizes the construction of physical facilities and the training of personnel at village, tambon, district, and provincial levels. The Fifth Five-Year Plan (1982-1986) is expected to continue the present system but expand it to cover more areas. However, there is no convincing evidence to date that this massive effort in rural primary health care expansion has made a significant impact on health facility use or on health status.

The primary care program has not been integrated with other RTG or private sector community projects to improve water supply and sanitation and to increase agricultural output.

Recommendations

1. An integrated program incorporating joint approaches to the problems of supply of abundant potable household water, nutritional surveillance and interventions, and improvements in sanitary human waste disposal should be developed in 10 to 20 selected provinces.
2. The program should also address problems in data collection and use; task assignment and supervision within the primary health care system; the process of community development and self-reliance; and interrelationships between MOPH activities and activities of other governmental and community agencies and organizations.
3. Specific targets and timetables should be set at a local level to provide eventual 100 percent surveillance of maternal and infant nutrition, prenatal tetanus immunization, DPT and BCG immunization, and the supply of ORS to infants and children with diarrhea.
4. Efforts to increase home production of food to supplement the diets of infants and children should be especially stressed.

IV. REVIEW OF HEALTH SECTOR ACTIVITIES

IV. REVIEW OF HEALTH SECTOR ACTIVITIES

Background

The USAID consultant team was impressed with the commitment of the MOPH and other government agencies to improve rural medical and health care services. With the start of the Fourth Five-Year Plan, an ambitious nationwide program was begun to expand and strengthen the delivery of primary health care and family planning services at the tambon and village levels and to strengthen the entire provincial health care infrastructure (Stewart, et al., 1980). The major new structural elements of this expanded system, including a variety of MOPH para-medical workers and a network of volunteer health and family planning workers in rural areas, are evident. It is also apparent that the full development and effective operation of this expanded rural primary care system will take at least five more years.

Several significant questions about the PHC system have not yet been fully addressed. The consultant team believes that the development of a rural primary health care delivery system should be supported and the effort strengthened and expanded. The team also believes that the existing primary care system should be made to work more efficiently and effectively. Clearer statements of program priorities, improved management and supervision, and development of more regular and effective methods of monitoring and evaluation are needed to accomplish this task.

The team strongly recommends that the MOPH address the following questions:

1. Community Diagnosis

Have the important health, medical care, nutrition, and family planning needs of the various rural population groups been clearly identified and ranked in order of importance?

2. Program Performance

Among current programs, what works and what does not work? Have adequate criteria been established and applied to identify satisfactory program performance? Have such criteria been applied to specific components of the overall primary care system?

3. Impact

Have the expected goals of primary health care activities been translated into objective measures of health status impact? Are any measures of health status impact being applied meaningfully?

4. Resource Allocation and Use

Within current program policies and guidelines, are available resources being used effectively? Are program targets being met? If not, why not?

5. Program Responsiveness and Adaptability

Have adequate mechanisms been established to alter and adapt existing programs to local variations in community needs or to reflect newly developed information on program performance?

6. Cost-Effectiveness

Have any serious attempts been made to translate measures of resource investment and anticipated outcomes into quantifiable measurements of cost-effectiveness? What practical measures of cost-effectiveness could be developed or adapted for routine use in rural primary health care delivery?

The consultant team fully recognizes the complexity of these questions and the difficulties in attempting to answer them. There are serious limitations in the availability, accuracy, completeness, and utility of current data on the primary health care system. There is also a widely recognized shortage of personnel within the MOPH who are qualified to undertake systematic program evaluation and health services research. Resources for planning, evaluation, and systems research are relatively scarce, and it has not been the custom to base future health planning decisions on detailed quantitative analyses of past and current activities. Nevertheless, precisely because overall resources for primary health care are scarce, it is especially important that empirical data derived from analyses of current programs be used to help shape future policies and plans. Strenuous efforts should be made to strengthen MOPH capability in program evaluation to provide guidelines for future activities.

Rural Primary Health Care Delivery

Rural primary health care services are being rapidly expanded throughout Thailand. The 20 underserved provinces are receiving special attention under the Accelerated Family Planning and Health Project (Population Project), which was funded in FY 1979-FY 1981 as a \$70 million multi-donor effort. An integral component of the Population Project is the \$5.5 million USAID loan to support the Rural Primary Health Care Expansion Project, which focuses on primary care manpower training, improved management and supervisory skills, and strengthened program and research capabilities. The USAID component of the Population Project was recently evaluated and the findings reported (Stewart, et al., 1980).

The consultant team was particularly impressed with the following aspects of current efforts in rural primary health care delivery: difficulties in setting clear priorities for rural health workers and village volunteers; failure in targeting high-risk recipients of services; problems in providing adequate supervision at the tambon and village levels; deficiencies in the health care data collection and reporting system; and a general lack of organized community involvement in the delivery of primary care services.

The team clearly understands that the proposed new Division of Primary Health Care has not yet been officially established and that limited MOPH resources are available for central coordination. It is also evident that the primary care system has been expanded very rapidly and that many of the required personnel are lacking or have only recently been trained. Moreover, many decisions about the decentralization of decision making and program management have not been made.

Considering all of the problems to be expected in expanding rural primary health care services at such a rapid pace, the consultant team feels obliged to stress the following observations:

1. The range of tasks being considered by the MOPH for delegation to VHVs appears to be unrealistically complex.
2. There is widespread confusion and skepticism about the degree to which VHVs can be expected to provide effective curative medical care.
3. Village Health Communicators are unlikely to have any significant impact on the delivery of village-level primary health care.
4. The proposed supervisory relationship between MOPH paramedics and VHVs/VHCs is unclear.
5. No clear distinction has been made between the concepts of "village-level primary health care" and "community development."
6. Insufficient attention has been given to other village-level individuals (e.g., village headmen, monks, shopkeepers, schoolteachers) who might be effective participants in primary health care programs.
7. Village pharmacies and traditional doctors seem to represent undervalued resources in meeting primary care needs.

Nutrition

The nutrition programs of the MOPH have failed to reduce the prevalence of protein-calorie malnutrition in Thailand, even though a high priority was accorded to nutrition in the Fourth Five-Year Plan (1977-1981). Thailand is a major net exporter of food, yet, the low-protein and caloric density of the Thai diet, maladaptive food habits, and poverty have combined to cause widespread malnutrition, particularly among infants and preschool children.

The team believes that the prevalence of malnutrition has not been reduced because of the method used to implement the MOPH program. The failure is not attributable to the problem and the proposed interventions. The current MOPH program to alleviate malnutrition depends on two elements: nutrition education (to promote behavioral change), and the distribution of protein-dense and calorie-rich supplementary foods to children with second- and third-degree malnutrition. The program is implemented through the primary health care system. It has been ineffective because government supplies are inadequate, because the program is not targeted to those who need the services, and because coverage of the population at risk is incomplete.

A. Supplemental Feeding

The provision of food supplements is based on nutritional surveillance: children are weighed periodically, and those who are malnourished are targeted to receive supplements. Surveillance is performed by the midwife, who is usually responsible for about 10 to 15 villages. She is frequently too busy with her duties at the midwifery center to visit homes, except in the few villages close to the center. Other mothers must bring their children to the center. Many do not do so. Since the midwifery center is usually in one of the larger villages in the service area, it is the more remote and often the poorer villages which are missed.

Supplements are distributed through Child Nutrition Centers (CNCs) and Child Feeding Centers (CFCs) and through home visits by the midwife. Alternatively, mothers can collect food at the center. The midwife fails to reach many villages, and many mothers do not travel to the health center. CNCs and CFCs do not reach the children most in need of services. Children under two are most seriously affected by malnutrition, but they do not usually attend the center. The poorest families cannot afford even the small charge which is usually required. As with health centers, CNCs and CFCs often are located in the relatively better served villages.

In a take-home supplemental feeding program, it is impossible to prevent substitution of the food supplement for other family food. The net increase in consumption by the target child is often negligible.

There are other problems in distributing a centrally processed supplemental food. The food is expensive. The Nutrition Division cannot meet the need, even though two-thirds of its budget goes to the purchase of supplemental food. At present, \$4 million of the budget for supplemental food is not being used because funds for transportation are not available. Therefore, the quantity of food being distributed is insufficient. Breakdowns in the delivery system are also common. The MOPH is considering methods to decentralize production and to reduce the unit cost of supplemental foods.

Nutrition surveillance and intervention should be performed in the villages, not in the tambons by midwives. Since the government has made a large investment in training and deploying PHC workers, it should consider using them for this purpose rather than introducing new personnel. The VHV lives in the village and knows all the residents. He is therefore in a position to weigh all infants and children, to deliver available food supplements to the malnourished, and to monitor child-feeding by making informal visits to households where children are malnourished.

There is widespread skepticism among health professionals about the present effectiveness of the VHV. This is because the VHV has too many ill-defined responsibilities and receives little support and infrequent supervisory visits from the midwife. If an effective nutrition program is a high priority, the MOPH must redefine the role of VHVs, focusing it on nutrition and directly related health problems. The number of tasks must be reduced; priorities among the remaining activities must be clearly specified; and the activities themselves must be well defined. VHV training must include specific instructions on the use of time, step-by-step definitions of tasks, and clearly stated protocols for intervention in cases of malnutrition, growth failure, and diarrhea.

Supervision of the VHV is essential to his motivation. If the midwife is to have time to visit every VHV in the field, then her time, too, must be restructured. Clear, specific instructions from the MOPH are needed. The MOPH must recognize that time spent on other activities will be reduced and that a clear commitment to the nutrition program (its establishment as a priority) is essential. Transportation funds also must be provided if the midwife is to travel regularly to all villages in her area of responsibility.

Other village-level workers can perform nutrition surveillance functions if there is no VHV or if the existing VHV is ineffective. Similarly, supervision and motivation can come from the villagers themselves, if they can be educated to perceive the need for services.

The team believes that reliance on supplemental foods to treat malnutrition should be reduced. As much as possible, families with malnourished children should be instructed to supplement their diets with foods locally available in the market or grown at home. Processed food supplements, well targeted and properly used, do cure individual cases of malnutrition, but they do not change the family behavior which caused the problem. Furthermore, the MOPH cannot afford to supply free the quantities of supplement needed, given the larger number of malnourished children.

Rice, which is normally the first food other than breast milk introduced to infants, is too bulky to provide sufficient calories and protein for health and growth, given babies' limited stomach capacity. A variety of suitable foods with better sources of protein (beans, pulses) and calories (fat, oil) can be prepared. Simple recipes using locally available ingredients should be developed by the Ministry of Agriculture's Division of Home Economics and taught to villagers.

Kasetsart University, which manufactures the food supplements used in the MOPH nutrition program, is considering ways to commercialize the distribution of these foods. Commercialization would reduce the cost to the government, since recipients would pay for the food, and probably improve the logistics of distribution. Since most households purchase some proportion of their food from the market, such a food would be accessible to the target population. It would have to be priced competitively with rice if the needy are to use it. The only advantage to such a food is that it would require less time to prepare than special meals. Many mothers are unwilling to prepare special foods for children. The feasibility of low-cost production of infant food and the extent of the potential market need to be investigated before the effect of commercial availability on malnutrition can be predicted.

B. Nutrition Education

Nutrition education in the present MOPH program is provided by the midwife at the midwifery center and for the reasons mentioned above fails to reach much of the population. It is not directed at those who have a demonstrable need to change their behavior: mothers of malnourished children. Furthermore, the education is too passive, consisting of lectures, posters, and leaflets. Because it is not based on behavioral objectives, the success of the educational effort cannot be measured.

For maximum effectiveness, education should be targeted to those who need it. It should be provided, at least in part, by VHV's as part of their nutrition surveillance and intervention activities. The messages must be simple, specific, and defined in terms of behavior. The VHV must be given clear instructions to be able to recognize situations in which particular messages are to be given and to determine whether household behavior has changed. The MOPH will need to prepare new training and educational materials to make its nutrition program work.

Education should not be restricted to households in which children are already malnourished. Nutrition education based on behavioral objectives should also be part of routine prenatal care. Well designed mass education campaigns can also play a role, but educational efforts will be most effective in cases where results can be seen. In rural villages, where households have a lot of contact, a successful behavioral change in one household will be informally disseminated to other households. Such dissemination has occurred in the villages of the Four-Village Study, an intensive experiment in nutrition and community development conducted by the Faculty of Medicine, Ramathibodi Hospital, Bangkok (Valyasevi, 1978).

C. Other Program Elements

The MOPH program has missed a number of opportunities to be more effective.

1. Growth Charts

Growth charts, which provide a graphic picture of a child's progress, are not used in the PHC system. These charts allow the immediate identification of malnourished children and of children whose growth is lagging. They are easily understandable, even by uneducated mothers. They should be used throughout the health care system, both to target food supplements and other services and to educate and motivate mothers to keep their children on the "right" growth curve. Every child under six should have a growth chart.

2. Oral Rehydration

Severe childhood diarrhea is a common complaint in the villages. Untreated, it causes serious nutrient losses that contribute to malnutrition. Oral rehydration therapy is easy to use, and it is both safe and effective in treating diarrhea, but it is not given routinely. Oral rehydration salts should be available in every village, and VHVs should be clearly instructed in their uses.

3. Prenatal Care

At present, prenatal care is given at the midwifery center; there is little outreach to mothers who do not voluntarily attend. As a result, many mothers do not receive prenatal checkups, the opportunity for a targeted education effort is lost, and immunization against tetanus reaches only 15 percent of pregnant women.

Since VHVs live in the village, they are in a position to learn of new pregnancies early. They should refer pregnant women to the midwife. They also should strongly encourage attendance at the midwifery center, especially in the case of a first pregnancy or of a pregnancy in a woman over 35. The importance of immunization and proper weight gain should be stressed. Once again, the VHV should have clearly stated instructions how to attend to a pregnancy in the village.

Related Community Activities

We have thus far discussed only modifications in the existing MOPH program which would make it more effective. The question of community involvement has not

been raised. The team believes that community organization and development is the most effective long-term strategy for reducing malnutrition. One reason is that a household's income and its access to productive resources are major constraints on food consumption and, therefore, on nutrition. Activities which generate income and promote increased home food production increase the household food supply, making it easier for the household to follow nutrition education messages. These activities include the use of improved technology to increase production and marketing techniques for home industries such as silk-raising and weaving. There are government agencies which provide assistance in these areas. Such activities fall outside the responsibilities of health workers, even though they can have a profound effect on nutrition. Others in the village must initiate these activities or seek outside assistance.

The link between community development and community health and nutrition has been recognized by the National Economic and Social Development Board (NESDB) and the MOPH in a plan to coordinate the work of community development officers with health and nutrition activities. It is not yet clear precisely how this plan will be implemented.

There is an experimental program in four villages in the Northeast (Valvasi, 1978) which has demonstrated that a well-run nutrition program, combined with community development activities, can reduce severe malnutrition and improve community health. This program probably cannot be exactly replicated nationwide, but many of its components can be adopted. The most important program elements are:

1. An agent of change, that is, a specific person who can start the community development process, encourage leadership and promote new activities.
2. Development of effective leadership capabilities in other members of the community.
3. Linkage with available government services, such as agricultural extension, and marketing assistance.

A. Agent of Change

Community development represents a change in established economic and social patterns. Some stimulus from outside the village is often necessary to start the process of change, since it is unlikely to occur spontaneously within a village. Therefore, an agent of change, a person who can motivate villagers to change and who can provide the technical information needed for economic improvement, is needed.

The team believes the proposed program to use recent university graduates as community motivators and agents of change in rural villages has promise. Many recent graduates are highly motivated to work in rural areas to benefit their

society. They have a demonstrated capacity to learn relatively complex technical materials. With appropriate education, they could offer a range of technical assistance to communities, and also could help develop leadership within the village. In addition to economic development, another objective of these workers would be to train leaders in the villages to ensure that problems continue to be identified and solved after their departure.

The program would select and train the graduates and deploy them in villages for a period of one or two years at a minimal stipend which could be covered by international donor funds. Graduates have been extremely effective in the Four-Village Study mentioned above.

B. Community Leadership

The team believes that in many villages, the potential for community leadership has not been fully exploited. Many villages contain individuals such as monks, schoolteachers, village council members, and headmen who are active in and concerned about the welfare of their communities. These people are often recognized and respected by villagers, and they are capable of organizing and motivating others to work on behalf of the village. They could be more effective in promoting community change and development if they could learn, through special training, how to improve the community and how to take advantage of the sources that are available.

The possibility of developing a training program for community leaders should be explored. Such a program should enable these persons to acquire some of the technical skills needed to promote improved production and marketing. It should teach them to identify community needs, and inform them of the technical assistance and resources available from government and other sources. Such a course should be open to villagers on a volunteer basis, since it is impossible to predict in advance which members of the community are most active. It is assumed that those willing to receive training will be sufficiently motivated to help their communities. The course should be offered in a few selected provinces to determine the magnitude of response from villagers. Ideally, it should be coordinated with the placement of the agent of change. This person could encourage villagers to take the training and then follow up the course with additional education and motivation.

C. Link with Government Services

Communities need an effective link with available government services, such as agricultural extension, home economics, and marketing assistance. This link could be a government employee who knows what services are available, how to request them, and how to ensure that they are received. The Community Development Officers (CDOs) of the Ministry of the Interior could serve this function. However, since there is only one CDO per district, a person at the village level (e.g., the agent of change or the trained village leader) might be more effective.

Related National Price Policies

National policies on agriculture, imports and exports, and prices have important effects on the availability of food and on the ability of consumers to purchase it. These policies can, therefore, be significant, indirect determinants of nutritional status. Two of the long-term strategies for alleviating malnutrition proposed in the Fourth Five-Year Plan were price controls on some foods, and the creation of an agency to distribute food, which would also restructure the food distribution, transportation, and storage systems, and food imports and exports. The details of these proposals were not spelled out, but some price control and food distribution schemes have already been initiated.

A. Subsidized Rice Distribution

Within the past five years, a distribution system has been established for subsidized rice. Special shops operate in urban areas throughout the country. The rice that is sold, "ochaa," is a mixture of one-fifth glutinous and four-fifths 15 percent broken rice. It is obtained by the central government as a tax on exports. Most consumers prefer non-glutinous rice and a lower percentage of broken, so the perceived quality of ochaa rice is low, though its nutritional content is no lower than that of ordinary rice. Any citizen may buy the subsidized rice. The ration is seven kilos per person per week; the quota for children under five is less. The price of ochaa rice is ₦ 3.30 per kg., compared with ₦ 6.00 to ₦ 6.50 per kg. for ordinary rice. Apparently, demand for the subsidized rice is high; it is reported that shops often run out of their weekly supplies after only two or three days. At present, about 20,000 metric tons per week are distributed throughout the country. Assuming that every consumer takes his entire quota, approximately 2.9 million people are receiving the rice.

The nutritional effect of the subsidy depends on how households distribute the food to the family, and how they use the real income increment which the subsidy represents. Since the quality of ochaa rice is low, it probably is consumed primarily by the urban poor. Since the poor tend to devote most of any increase in real income to food, the subsidy may well increase the household food supply. At present, no effort is being made to determine who consumes the subsidized rice or to monitor its nutritional impact.

B. Price Controls on Basic Goods

A somewhat longer-standing policy is price controls on basic goods, including foods such as cooking oil, meat, sugar, canned and powdered milk, and wheat flour. People visit the markets in each province to check on and enforce prices, which are set based on government calculations of the costs of production, plus a "reasonable" margin. Most foods are sold at or close to the control price.

Enforcement of meat prices is intentionally lax, because production costs have risen sharply in recent years; market prices are about 120 percent of fixed levels. Due to a current shortage, the black market price for sugar is more than double the fixed price. Cooking oil now sells below the fixed price. It is not clear that price controls are effective when they operate against market forces.

Because of government restrictions on exports, the farm-gate price of rice is about half the current world price, and the domestic retail price is about 70 percent of world levels. This low-price policy benefits rice purchasers, but presumably reduces the incomes of rice producers. The large majority of the population produces and purchases rice. Cash purchases of grain constitute 16 percent of farmers' total food consumption (the figure is slightly higher for those who rent land); home food production constitutes only 21 percent (26 percent for renters).^{*} Since consumers spend about 47 percent of real income on food, and since rice is the major contributor of calories to the diet, it is likely that the low price of rice increases the total calories available to those households which purchase it. The nutritional significance of this food depends on how calories are distributed within the household.

At least one agricultural economist (Ralston, 1980) has suggested that allowing domestic prices to fluctuate with the world price might not increase the incomes of rice producers, because the world demand for Thai rice is relatively inelastic; increased production would probably cause the world price to fall. If this is so, the low-price policy for rice probably has a positive effect on most households' food supplies.

C. Fair Price Shops

A plan is being implemented to establish special stores which will sell rice, sugar, and about 18 other consumer items at prices about 25 percent below open-market prices. The government will procure these goods from producers and distribute them to licensed retailers in the hope of reducing costs by eliminating the role of the middleman. Initially, the scale of the project will be small: 150 stores in Bangkok, and three in each province. If the project is successful, it will be expanded.

The purpose of the project is to offer an alternative source of supply of basic consumer items and to dampen open-market price increases. Although the project was conceived to benefit the poor, there is no restriction on who may use the shops. The project intends to affect purchasing power, but not, explicitly, nutrition. In other countries where similar projects have been tried, the government has incurred considerable expenditure, since the role of the middleman entails real costs that cannot be eliminated.

^{*}National Statistics Office; undated.

D. Government Discount Brands

Within the past few weeks, the government has started to distribute several products, including condensed milk and cooking oil, under its own "Zinthal" brand name at prices below open-market prices. The products are processed and packaged by private manufacturers under contract with the government. While their brand name and label set them apart, their quality is supposed to equal the quality of privately distributed goods.

As with Fair Price Shops, the purposes of the project are to dampen market prices and to offer basic necessities to consumers at low cost. Anyone may purchase these products. There are widespread rumors of black marketeering, in particular by entrepreneurs buying goods at the low price and repackaging them for sale at market prices. However, the project has not been in operation long enough to be evaluated.

All of these price-related policies have the potential to affect nutritional status indirectly by increasing households' purchasing power and their access to food. While the policies are ostensibly directed at low-income consumers, only the low-quality ochaa rice is targeted toward the poor. None of the programs has an explicit nutrition focus, nor is any apparent attempt being made to combine them with nutrition education.

An evaluation of the costs of each of these projects, its operational efficiency, its coverage of the population, and its effects on household income, food consumption, and nutritional status would be useful in determining which of the projects is most beneficial and whether any of them should be modified. In addition to operational evaluations, small-scale empirical studies of households affected by these programs should be made. If the RTG expresses interest, AID could provide technical assistance and funding for such policy-oriented research. The influence of these price policies should be carefully monitored and documented in the evaluation of the community nutrition activities described in this report.

Proposed Coordinated Nutrition and Health Program

The foregoing discussion suggests the potential benefits of a coordinated strategy to improve community health and to reduce the prevalence of childhood malnutrition. There is evidence from the Four-Village Study that such a strategy can be effective. None of the elements is itself new. What makes the proposed strategy different is the commitment to bring all of the elements together, to eliminate existing barriers to effectiveness, and to make the combined components work.

A. Program Goals

The goals of the proposed strategy are:

- o Eliminate second- and third-degree malnutrition in villages served by the program.
- o Eliminate mortality from severe childhood diarrhea.
- o Eliminate neonatal tetanus.
- o Reduce the proportion of low birth weight. 33 percent.
- o Reduce the prevalence of first-degree malnutrition by 33 percent.

It should be possible to reach these specific targets within two years, once a program has begun in a village. The collection of baseline information on these measures at the start of the program is essential to determine the program's effectiveness.

Measures of service delivery are useful indicators of the progression of a project, although success can be measured only by results. The services that are included in the program and that are assumed to contribute to the realization of its goals are:

- o Maintenance of growth charts on every child under age six in the village. Informal nutrition education should be part of this universal nutrition surveillance. Weighing should take place every month from birth to three months; every two months to one year; every three months to two years; and every six months to six years of age.
- o Delivery of babies at a health facility (midwifery center or better) for all primiparas and all women over age 35, and for all women with reason to expect complications.
- o Nutrition education and tetanus immunization of all pregnant women.
- o Nutrition education (focused on food production, purchase, preparation, intrafamily distribution) of appropriate members of all households with children with second- and third-degree malnutrition and with children who fail to grow in two or more successive weighings.

A broader goal of the program is the economic and community development of the villages served. It is more difficult to set quantitative targets for this aspect of the program, because it is harder to establish a baseline and harder to measure short-term change. The measures of effectiveness would be increased production of

food and home handicrafts, increased household cash and in-kind income, and degree of community participation (e.g., cash and labor contributions) in projects involving the construction of water systems, community facilities (e.g., health centers), agricultural facilities (e.g., improved fish ponds), etc.

B. Magnitude of the Program

Five hundred villages represents a reasonable target for coverage during the three-year project period. This figure represents one percent of the villages in Thailand. Start-up should be slow, so that results can be carefully monitored in a few villages and training and other aspects modified as the program expands.

The program will have its greatest impact in areas where complementary services are available. Since the program relies heavily on the availability of the VHV and the midwife, it is reasonable to include villages which are part of the Rural Primary Health Care Expansion Project.

Because of the ultimate size of the program, it will also cover villages not under the PHC Expansion Project. Needy villages should be a priority, but they should be selected from all four regions of the country. As experience is acquired, the program can be adapted to different ecological conditions.

C. Coordination with Other Sectors

The proposed program operates through the health sector but is also closely linked with other sectors, particularly agriculture.

An important question about any program which relies heavily on education for behavioral change is whether such change is possible or whether an absolute resource constraint prevents people from altering their child-feeding practices and food habits. An effort that focuses on education without also trying to increase income smacks of "blaming the victim" without offering substantive assistance. There is considerable evidence (Pisolyabutra and Viravidhaya, 1974; Pisolyabutra, 1976) that food habits themselves are responsible for much childhood malnutrition and that, in many cases, improved use of existing family resources alone would result in improved diets of infants and children. It is easier to promote a change in food practices when a family has more food available. For this reason, the proposed program goes beyond the provision of education and preventive and curative health care and attempts to promote economic development as well.

The mutually reinforcing effects of the nutrition program and the provision of increased water supply through small piped-water systems are discussed below. Water used for sanitation also can be used to increase kitchen-garden production and animal raising for food and cash. Similarly, the development of new or improved marketing methods to increase villagers'

profits will result in increased income which can be spent on improved diets, among other things. Such promotion is the role of the proposed agent of change. It is important that the neediest households be explicitly included in any economic development scheme.

Almost all rural villagers are farmers, and agricultural development there is perhaps the most important potential means for improving household real income. Agriculture extension agents under the Ministry of Agriculture and Cooperatives (MOAC) are available at the rate of about one for every thousand households. Their role is to provide technical assistance to farmers, as well as access to subsidized inputs, such as fertilizer and improved seeds. They will be an important resource for the villages in the program. Both the trained community leaders and the agent of change will have some agricultural and marketing training, but they will also know how to call on the Agricultural Extension service for help. A new MOAC program that focuses on increased home food production for nutritional purposes receives technical assistance from home economists. Workers in the project villages will consult these specialists to determine what is the best advice and guidance to give to villagers.

Improved agricultural production can benefit health and nutrition through either increased food availability or increased income. The path along which an effect is passed will depend on the type of agriculture in the region and the marketing infrastructure available. The proposed health sector program obviously cannot influence many of the variables (e.g., type of soil, availability of large-scale irrigation, availability of farm-to-market roads) affecting agricultural production and income. This is not essential to the success of the program. Whatever agricultural improvements are possible in a given village should, of course, be made, but it is the job of the village leaders and the agent of change to identify the most promising means of raising village income, whatever these may be. Certainly the proposed program should not be made contingent on elaborate macroanalysis of the agricultural sector. Constraints on local economic progress, as well as solutions, will be identified at the village level during the project. The process is, in effect, community development. If a need is identified (in the village) for an agricultural project (e.g., irrigation) requiring large capital investment, village workers will either seek government assistance or mobilize community resources to implement the project.

D. Questions for Research and Evaluation

The proposed program will be implemented in a relatively large number of villages, which will represent a wide variety of social, economic, and ecological conditions and many combinations of available complementary services. It is, obviously, impossible to set up a carefully controlled research study on the effects of these conditions on program effectiveness, because the number of combinations is too large and many conditions will covary, making it impossible to distinguish the effects. Nonetheless, if data are collected on measurable impacts (e.g., prevalence of malnutrition, incidence of diarrhea, and neonatal tetanus) on delivery of specific services, and on the use of resources external to the program (e.g., construction of irrigation systems, piped-water systems), it should be possible to identify the most effective combination of programs.

It is important to consider the degree to which the inputs of the proposed nutrition and health sector program can themselves be effective and to what extent they depend on integration with other sectors. The marginal effect of increasing capital investment in agriculture on measures of nutrition and health should also be explored. Is most of the impact achieved as a result of small improvements (e.g., water for kitchen gardens; improved seed; altered choice of vegetables to grow)? Or do large-scale inputs significantly increase the effect? The answers to such questions are important for later analysis of cost-effectiveness. Of course, the answers to these questions will depend, in part, on existing resource constraints in a given village.

Data also should be collected to answer questions about the details of program design and implementation. One should consider, for example, alternative methods of education and training, ways of deploying program workers, and uses of workers' time. Data needs for health/nutrition program evaluation and for operation and management uses are discussed in Appendix A.

E. Cost

An effort has been made to propose a program which will be replicable on a large scale. To accomplish this, costs must be kept low. Most of the workers in the program are already provided for in the MOPH budget. The agent of change will be a temporary position, at a stipend around \$1,000 per month. Other program costs, for example, the development of training program and educational materials, do not involve a great deal of funding. Furthermore, as one-time costs, they will not recur during the life of the program.

The magnitude of benefits to be expected will vary widely from one region to another, depending on the economic potential of the area and the prevalence of health and nutrition problems. For this reason, at this stage in program development, any effort to calculate full costs and benefits would not be useful. Using regional data, however, some very rough estimates may be made after the project villages have been identified.

F. Project Paper Issues

The feasibility of the project depends on the MOPH's willingness to redefine the tasks and responsibilities of the VHV and midwife and to restructure training.

Furthermore, the success of the project depends on the willingness of university graduates to volunteer for work in the villages as agents of change, and on the interest of village leaders in being trained and becoming active in community development activities in their villages.

It should be noted that the individual components of the project are separable. For example, programmatic improvements in the rural PHC delivery system

would have a beneficial impact, irrespective of the availability of village leaders or agents of change.

G. Potential AID Input

Aid could support this program in the following ways:

1. Provide funds and technical assistance (TA) to develop training courses.
2. Fund training.
3. Provide TA and funds for the development of new health and nutrition education materials.
4. Fund university graduate-volunteer stipends.
5. Provide TA and funds to design and produce growth charts.
6. Provide TA and fund research on appropriate home-prepared weaning food recipes.
7. Provide TA and funding for production and marketing studies for a commercially marketed low-cost infant food.
8. Provide technical assistance and funding for research on consumption and the nutritional effects of government food price policies.

Water Supply and Sanitation

In this section we assess the strategies used to improve the quantity, quality and accessibility of rural water systems. We recommend the expansion of piped-water systems because these systems have been proven to work in Thailand, can improve health and nutrition, can be self-supporting, and can have a significant development impact in rural areas.

A. Water Supply Strategies

The methods used to provide water for villages include: shallow wells with or without handpumps; rainwater catchment cisterns; deep wells with handpumps and piped-water systems using either surface or ground water. When making decisions about technologies, it is important to understand their operational characteristics.

Shallow wells are the most common source of water for rural communities in Thailand. Some villages have a number of shallow wells that provide dependable sources of water throughout the year, but in other communities water is not available during the dry season. Some shallow wells are used for drinking because of taste preferences.

The water quality of shallow wells can be improved if surface runoff is diverted. This is done by building a raised curb above ground level.

Water is usually withdrawn from shallow wells by a bucket. To ensure the quality of water, many wells are being completely sealed and fitted with handpumps. The team believes that sealing wells or fitting wells with handpumps does little to improve water quality, because, as extensive evidence confirms, water is inevitably contaminated when it is collected, transported, and stored in the home.

Deep wells with handpumps provide safe water, but water from such a well often is not used for consumption because of its taste. In addition, there is an universal problem in maintaining handpumps. This problem is aggravated by the large number of agencies involved in village handpump installation and by the variety of equipment used. It is common to find that both the Thai "608" and U.S. Dempster handpumps are installed and maintained by different agencies in a single remote community.

Rainwater cisterns are convenient sources of water and are preferred by almost everyone because of the taste of the water. Water is collected after the first rains have washed the roofs and gutters, and it is stored in cisterns of various sizes. Rainwater is preferred for drinking; during the dry period it is reserved solely for this purpose. The quality of rainwater may be impaired by dirty roofs or gutters, by storage in contaminated cisterns, or during withdrawal and use.

The major argument against rainwater cisterns, however, is basically economic. Although the capital cost of cisterns is relatively low, their storage capacity provides only limited water availability over the long dry period. Costs per cubic meter of water used are, therefore, very high.

Piped-water systems distribute water from either groundwater or surface sources to individual house connections or to communal standpipes within a village. The water is treated appropriately to remove suspended solids or excessive iron, and it is generally chlorinated. Most piped systems have substituted metered house connections for public standpipes.

Water use per capita is high, although many people do not use water for drinking. Most water is used for household and personal sanitation, gardening, and animal rearing. Families served by piped-water systems use large amounts of water, even though the costs per cubic meter are relatively high. A recent survey found that most rural systems charge $\text{฿}3$ per cubic meter, compared to $\text{฿}1.9$ in urban communities.

The present price of $\text{฿}1.9$ per cubic meter (the charge for the larger systems operated by the PWWA) is causing dissatisfaction among the villagers who pay,

on the average, over 50 percent more. The RTG should require all systems to be self-sufficient and should adopt a policy that would ensure adequate revenues. Such a policy would be consistent with the recent announcement that all state enterprises should be self-sustaining.

Piped systems in rural communities have a reputation for being unreliable, a result of a number of misleading reports based on old data. Piped systems are, in fact, among the most reliable methods of water supply in rural areas of Thailand. A recent survey of a random sample of systems in the Northeast, North, and Central areas showed that 93 percent were operating. Another 3 percent were in operating condition but lacking a trained operator.

B. System Comparisons

There is no perfect water system. Shallow wells and rainwater cisterns are preferred as sources of drinking water; deep wells provide safe water but the water often is not acceptable for drinking and the costs are restricted to a few locations in a village; piped-water systems provide large quantities of safe water, but chlorination or other taste constraints limit the use of the water for drinking.

Piped-water systems and cistern storage are the only methods that are or can be self-sustaining. Other water systems impose a cumulative budget requirement for maintenance on the government. Careful consideration should be given to the cumulative costs of extensive programs to provide handpumps.

C. Water and Health

Despite the many questions on the taste preference of various methods of supply, a plentiful supply of a suitable quality of water can affect the health of villagers directly by improving nutrition and indirectly by increasing income. The direct improvement of nutritional status is achieved by decreasing food wastage from diarrhea and by increasing the availability of food from home gardens and animal rearing for home consumption. Indirectly, nutrition is improved by using the time previously spent in collecting water for economic activities, such as raising cash crops or making and selling handicrafts.

1. Piped Water and Reduction of Diarrhea

A number of studies have shown that better quality water seldom results in reduction of diarrhea (Feacham, 1977). However, a USAID-funded study in Guatemala shows that a piped chlorinated water supply delivered through private metered connections resulted in a substantial reduction in the rates of diarrhea among all age groups, except infants younger than one and adults over forty-five. Those most affected were children between the ages of one and seven who experienced a 30 percent reduction in the incidence of diarrhea over the 42-month period of the study.

(Dworkin and Dworkin, 1980). What is particularly significant for Thailand is that this reduction in the rate of diarrhea resulted primarily from improvement in water quantity. Water quality, which was good at the source, became contaminated by fecal coliforms before use.

Reduction in diarrhea results in decreased food wastage and therefore better nutrition. If the experience in Guatemala can be applied to Thailand, it would affect an age group among whom malnutrition is known to be a significant problem.

2. Additional Benefits of Piped-Water Systems

A recent survey of piped systems in Thailand found villagers using water from piped systems for gardening and animal rearing, both for home use and marketing (Dworkin and Pillsbury, 1979). The team's field observations confirmed that some villagers use piped supplies for gardening, both for home use of food produced and for cash income. Home gardening could be a valuable method of supplementing diets where nutrition is a problem.

Another benefit reported by users of piped systems is increased income. Villagers find they can devote more time to traditional crafts. While it is impossible to relate small increases in income directly to health and nutritional status, the relationship between significantly increased income and improved nutrition has been well established.

3. Water Seal Privies

Piped-water systems promote the use of water seal privies. No specific government programs fund their installation. Most households in communities served by piped-water supplies had, and claimed to use, water seal privies. The ready availability of water seems to be a greater incentive for the family to construct and use a privy.

4. Institutional Factors

Arrangements for building and maintaining piped-water supplies in small communities have not been made. The PWWA has been given the responsibility for all piped systems in existence. However, it has not been given the funds that it considers necessary to provide supervision. Supervision includes inspection of the system, recommendations for preventive maintenance, and consultation with the village committee on management problems.

The Ministry of Public Health Rural Water Supply Division (RWSD) no longer has responsibility for monthly supervision of all small piped-water systems. The 1979 USAID report identified some problems in operation that had resulted from

inadequate supervision. Present field observations confirm that systems are not visited regularly by any supervisory personnel. If this lack of supervision continues, the small piped systems that have been operating so successfully over the past years will no longer continue to function.

The capability exists in both the PWMA and in the Ministry of Public Health to build, operate, and maintain small piped systems in rural communities. The construction of additional systems should be delayed until the RTG makes a clear decision about the appropriate locus of institutional responsibility. Once a decision is reached, regular supervisory visits should be reinstated. As the number of systems increases, less frequent visits will be necessary, but visits should be made at least once every other month. Cutting the time period would allow the number of systems to be doubled without adding more personnel. It is not the function of USAID to recommend specific institutional arrangements. Nevertheless, certain characteristics of these small piped systems should be considered when responsibility for supervision and maintenance is assigned. These systems must be planned and built with active participation by the community; they must be designed and operated at low cost to be self-sustaining; and they must be supervised regularly.

5. Reaching Low-Income People

Water systems serving community elites will not have any effect on those who most need the services, the poor. Previous piped systems and those being built by the PWMA require individual contributions from users who want service. Systems should provide private metered connections for all households within the service area. The cost of such connections should be funded as part of the capital cost of the system.

Tariffs also should be structured to ensure that all users can afford basic amounts of water for personal use and household sanitation. Increasing rates should be charged for water used for other purposes. Acceptance of an equitable rate structure that will provide the necessary financial support should be a precondition to selection of a community for a water supply system.

6. Sanitation

The sanitarian is the trained professional who should provide advice to the villagers on a number of sanitation problems that can affect health, including water use and disposal, excreta disposal, food handling, refuse disposal, and insect and rodent control. The sanitarian also should provide advice on housing design and the modification and location of water sources and privies.

The sanitarian's priorities are clear. His first task in rural communities should be to promote the access and use of water sealed privies. He should provide advice on the location and integration of privies in relation to the house and to adjacent homes. Coincidental with the location of the privy

should be the location of the water source and water disposal areas so that standing grey water (sullage) will not be a potential health hazard.

A criterion for providing a piped-water system to a community should be the commitment of the community to provide complete access to all families to a domestic water sealed privy.

When water becomes available the sanitarian should provide advice and, to the extent possible, monitor village attitudes on the appropriate use of water to promote sanitary practices.

The sanitarian has a second set of priorities for late phases of the program. These priorities are to provide advice and monitor refuse disposal and insect and rodent control. The sanitarian also should provide advice on the location and design of new homes to ensure that water service, sullage disposal, and privy location will not adversely affect the environmental balance of the community.

7. Program Extent and Costs

The previous USAID-funded program to provide piped water to rural villages developed a number of standardized designs for water systems. These designs are still being used. Now over 12 years old, they are for larger communities than the proposed present program, where all villages will have 2,000 persons and have a median population of 600. Implementation of older designs will cost an average of ₡750 per capita. New standardized designs that cost less, serve fewer people, and require less maintenance are needed.

The RWSD has proposed costs for smaller systems of between ₡450-₡600 per person served. This figure does not include the cost of piping water to the house or metering use, which would add an additional initial investment of ₡100 per person.

A community of 600 could be furnished with piped and metered water from these less complex systems for ₡360,000 (\$18,000). These cost estimates are consistent with those prepared independently for USAID/T by Pineo and others in 1979.

The feasibility of the program has been enhanced considerably by the recent electrification program, one objective of which is to supply electricity to half the villagers in the Northeast by 1982. Electric motors are less costly to operate and maintain than diesel engines. The Provincial Electricity Authority (PEA) proposes complete funding for electrical service to rural villagers, without contributions from the residents. The director of the Office of Rural Electrification has agreed to provide electrical service to those communities that will receive rural water systems under the proposed program.

8. Criteria for Village Selection

The criteria used to select a village in which a piped-water system will be installed should include: willingness to contribute suitable land for the system; willingness to contribute to the capital cost; willingness to adopt a suitable rate structure for the water; and willingness to set a goal of 100 percent access to water sealed privies.

The team believes that considerable disposable income could be used to defray the initial capital cost of the system. This would ensure the villagers' commitment to the system's continued operation. A survey of the ability and willingness of the villagers to pay for a piped-water system should be made before the project is implemented.

A program to serve 500 villages with piped supplies would require a total capital cost of less than \$10 million.

Population

The National Family Planning Program is expected to meet its goal of reducing population growth to 2.1 percent by 1981. The Committee on Population Policy and Planning established a new target of 1.5 percent population growth by 1986. The earlier program was based on an extensive program to generate demand for services and on an effective program to deliver those services. Research findings suggest that little motivation was necessary. Most persons who use contraceptive services needed only information and supply.

The new program, which is designed to reach the 1.5 percent target, is a replication of the elements of past successful programs. It also makes more widely available voluntary surgical contraception (which is particularly emphasized in rural areas) and oral contraceptives, and involves special efforts to expand coverage of commodities and services in areas with low contraceptive prevalence rates. To increase the availability of personnel, the MOPH has undertaken a pilot program to train paramedical workers to perform voluntary surgical sterilizations, to insert IUDs, and to inject DMPA.

The number and types of services available should be increased immediately. There is a demonstrated need for delivery of some methods of contraception to remote communities. Current MOPH and NFPP policies place unnecessary constraints on the use of paramedical personnel who provide VSC, IUD, and DMPA services in rural health facilities. The rationale for restricting such activities to medical personnel is not compelling. A review of the current policy constraining the use of paramedical personnel should be made. The team encourages the training and use of these persons to provide all contraceptive services.

In view of the high level of commitment to the family planning program, it is disturbing that the RTG has relied so heavily on outside support. More than half the cost of the contraceptives used in the program are provided by outside funding, much of which may end in 1981. The extended program will have problems

maintaining adequate supplies unless the budget is increased substantially. Even now there are periodic shortages of IUDs. There is evidence that DMPA may be in short supply when it becomes available for use by paramedical personnel. In view of the long association with the National Family Planning Program, USAID should gradually reduce its support of the routine operating expenses of the program rather than terminating funding when the project is completed.

The team has some reservations about the proposed program expansion, and questions whether it is sufficient. The team concurs with the statement in the NESDB study that "we cannot simply rely on the supply of contraceptive methods as we did in the past" (Hongladorn, et al., 1980, p. 10). USAID should provide grant funding to improve the speed and utility of management information flowing back from the field. It should support the use of additional methods of motivation in areas where contraceptive use is lagging; and it should fund research to determine what works and why.

Research opportunities have been neglected. There are few answers to questions about varying performance in different areas within a given region. The answers to such questions could be used to guide the future direction of the program. Research should be focused on simple questions, the answers to which may be used to determine program direction. Research studies should be designed to provide fast answers using limited samples; they should be more than rigorous academic exercises. More extensive sampling is recommended only when limited sampling provides ambiguous answers.

Advantages of Combined Programs in Water, Nutrition, and Health

Lack of water, poor nutrition, and lack of primary health care affect the development potential of a community. Each individually affects the health of the population, but the effects of all three conditions are closely interrelated. Programs to provide water, improve nutrition, and provide primary health care can be instituted separately, and each can have a positive impact. The team suggests that combining HPN programs in a single community will increase both the magnitude and the cost-effectiveness of their benefits. Projects do not necessarily have to be tied together; some communities already have piped-water systems, for example, and may require only health and nutrition programs. What the team is saying is that each of the three different project types deals with aspects of the same problem (community health) which the others do not address.

For example, nutrition programs emphasize the provision of supplementary food. Experiences have shown that in many cases, villagers use piped water to raise home gardens. This permits them to raise supplementary foods for themselves, without relying on outside sources. Appropriate use of the food does not automatically follow; nutrition education is also necessary. There is good evidence that the incidence of diarrhea is reduced when supplies of water are abundant. At the same time, the detrimental effects of diarrhea can be reduced if ORS is available and used in primary health care. This is an example of two non-redundant approaches to the same specific problem.

Because a combined program has an impact on the community's health problems, people working in these programs may find that they have time for other things. As water supply acts to reduce diarrhea, for example, health workers may have more time to devote to preventive health activities or family planning.

Theoretically, the attractiveness of the combined approach to community development is that many of the elements are already in place, or at least have been tested and proved effective in other communities. Piped and metered water systems do not require pretesting: they work. Water seal privies are already used extensively. Health and nutrition programs are active in some areas, and can be redirected so that villagers can take advantage of the benefits of water systems as well. The great development potential of combined programs is not to create a new plan, but to fit together the existing pieces and make them work.

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APPENDICES

Appendix A
DATA SYSTEM REQUIREMENTS

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DATA SYSTEM REQUIREMENTS

Finding

The data system used by the MOPH is seriously inadequate. It does not provide users at any level with timely information to make informed judgments. In addition, our field work indicates that misinformation may be generated to meet performance standards.

Recommendation

The team strongly recommends that the MOPH review and strengthen the system so that supervisors and managers at all levels will have the evaluation information they need to determine if the program is working; the planning information they need to determine the need for new facilities or additional training; and the management information they need to assist in logistics and budgeting.

The MOPH already has a substantial data system in place. It is not clear at this time what optimal strategy would provide the information necessary to assess and guide ongoing or completed programs.

The MOPH should review the existing system of data collection and determine the utility of the products produced and the capability of the personnel and equipment used. When this review has been completed, the MOPH should decide whether a trial revision should be undertaken in a selected geographical area or a number of independent evaluation studies carried out independently of the ongoing data system.

USAID should support an effort to:

- review the system;
- redefine needs and objectives; and,
- improve the capability and competence of the Central Information Division through the training of personnel in Thailand and abroad.

Operational Research Center

Grant funds should be provided for short-term operational research studies. The activity should be based in the MOPH or in an academic institute. Staff should include a full-time technical expert with demonstrated competence in research design, protocol preparation, and the implementation of studies in the

field. Funding for this activity should be restricted to payment of the actual costs of the research. Funds should not be used to cover institutional administration costs or to supplement salaries.

Appendix B
CONDUCT OF THE REVIEW

Appendix B

CONDUCT OF THE REVIEW

Purpose

A thorough assessment of needs and activities in the health, population, and nutrition sector was prepared by the staff of USAID/Thailand. The consultant team was asked to review and comment on this document. It was to give particular attention to the following:

- o Assessment of the adequacy of existing policies and programs to improve health status and reduce population growth.
- o Identification of priority areas of intervention to affect health status and population growth.
- o Identification of potential areas for future USAID assistance.
- o Analysis of alternative strategies to carry out programs in these areas, including: identification of strategies, supporting rationale for selection of strategies, analysis of likely project cost, rationale for AID assistance, potential institutional and administrative constraints to implementation, and identification of research and feasibility studies needed during project development.

The team was asked to amplify its review of this health needs assessment document through on-site review of health sector activities and programs and discussions with RTG and mission staff, and to assist in the development of project implementation documents.

Participants

The three-member review team included:

- * Michael M. Stewart, M.D., M.P.H., Team Leader
Associate Professor of Medicine
Chief, Division of General Internal Medicine
Director, Office of Primary Care Education
Faculty of Medicine, Columbia University
New York, New York
- * Daniel Dworkin, Ph.D.
Agency for International Development
Bureau for Program and Policy Coordination
Office of Evaluation, Studies Division
Washington, D.C.

- * **Beatrice Lorge Rogers, Ph.D.**
Research Associate
International Nutrition Planning Program
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dr. Stewart is an internist with a special interest in public health, community medicine, and primary care education. His international experience includes four years in Thailand as a field staff member of the Rockefeller Foundation and as a faculty member at the Ramathibodi Hospital Faculty of Medicine, Mahidol University. Dr. Stewart has a working knowledge of the Thai language.

Dr. Dworkin, visiting Associate Professor of Geography at Clark University, was seconded to the Office of Evaluation in the Programming and Policy Coordination Bureau of the Agency for International Development. He has participated in a number of evaluations of rural water supply programs in developing countries, including a previous study (1979) of piped-water systems in rural communities in Thailand.

Dr. Rogers is an economist who specializes in food and nutrition. Her major research interest is the nutritional implications of price, income, and agricultural policies. She has evaluated nutrition-related policies and programs in Pakistan and India, as well as in the United States.

Methodology

The review team was briefed in Washington, D.C., by USAID/W staff. World Bank staff involved in related health-nutrition sector activities also participated in the discussions. The USAID/Thailand needs assessment document and related documents were made available to the team. Three weeks were spent in-country.

Time constraints were severe. The team was able to spend only four days observing health and nutrition programs and water supply systems outside Bangkok. Heavy reliance was placed on published and unpublished documents and on data available from USAID/T staff and from Thai research institutions and government offices. The team met with Mission staff, RTG officials, and university faculty members to obtain information on present programs and future plans and policies, and to present for discussion the observations and findings from the review.

While this report contains the team's independent observations and analysis, it also reflects and has benefited significantly from the team's extensive interaction with Mission staff and RTG representatives.

Appendix C

ITINERARY AND PRINCIPAL CONTACTS

Appendix C

ITINERARY AND PRINCIPAL CONTACTS

7/10/80 Bangkok

USAID Briefing

Mr. Henry Merrill, Director, O/HPN, USAID/Thailand

7/11/80 Bangkok

Sanitation Division, MOPH

Mr. Chit Chaiwong, Director

Mr. Thira Thatsanatheb

Nutrition Division, MOPH

Dr. Prasert Suvannus, Director

Institute of Nutrition, Mahidol University

Dr. Aree Valyasevi, Director

7/12/80 Bangkok

Documents Review

7/13/80 To Ubol

7/14/80 Ubol Province:

Field Visit

District Trakan Phut Phon

Village Feeding Centers and Water Supplies

7/15/80 Ubol Province

Field Visit:

District Phibun Mansahan

District Khuang Nai

Village Feeding Centers and Piped-Water Systems

7/16/80 Buri Ram Province

Field Visit:

Sawayjik Village Nutrition Center

Nongtat Tambon Biogas Facilities

Goksaart Village Development Project

Pukwarn Village Piped-Water System

7/17/80 Bangkok

NESDB Meeting

Mrs. Orathip Tanskul

Mr. Visuth Kanchanavisuth

Faculty of Public Health, Mahidol University

Dr. Debhanom Muangman, Dean

7/18/80 Bangkok

MOPH

Dr. Amorn Nondasuta, Deputy Under-Secretary for Planning and Evaluation

Nutrition Division, Department of Health, MOPH

Dr. Chana Kumboonrat, Deputy Director-General

Dr. Prasert Suvannua, Director, Nutrition Division

Staff members of Nutrition Division, MOPH, and Agricultural Extension Department, Ministry of Agriculture and Cooperatives

Mr. Somchet Taeracoop, Public Utilities Sector, Infrastructure Projects Division, National Economic and Social Development Board

7/19/80 Bangkok

Dr. Robert Ralston, USAID/O/RD

Dr. Ronald Wilson, Lampang Project

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Institute of Nutrition, Mahidol University

Dr. Aree Valyasevi, Director

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NESDB Standing Committee on Health

Mrs. Sumontha Thanyapon, DTEC

Mr. Pichet Sunthornpipit, DTEC

Mr. Poonsap Piya-Anant, Bureau of Budget

Mr. Visuth Kanchanavisuth

Community Based Family Planning Services

Mr. Mechai Viravaidya

Dr. Maiae Sundaghul

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Ramathibodi Hospital

Dr. Pensri Khanjanasiththi, Department of Pediatrics

MOPH

Dr. Preecha Deesawasdi, Director, Division of Primary Health Care

Dr. Michael Maurier, Health Planning Division

Family Health Division, MOPH

Dr. Prayoon Klinchom, Deputy Director

Dr. Suvanee Sattayapan, Assistant Director

Miss Tongplaew Narkavonakit, Chief, Research and Evaluation Section

Provincial Water Works Authority

Dr. Vithya Pienvichitr, Governor

Mr. Sittichai Pissathanporn, Rural Water Supply Department

Mr. Kometh Fuengtharnthip, Technical and Planning Department

**Mr. Chetpan Kamkaew, Director, Rural Water Supply Division
Ministry of Public Health**

7/24/80 Bangkok

Faculty of Public Health, Mahidol University

Dr. Debhanom Muangman, Dean

7/24/80 Bangkok

Kasetsart University

**Dr. Amara Bhumirak, Director, Institute of Food Research and
Product Development**

Institute of Nutrition, Mahidol University

Dr. Aree Valyasevi, Director

7/29/80 Bangkok

Price Index Division, Business Economics Department
Ministry of Commerce

Mr. Chamnong, Director

Ministry of Agriculture and Cooperatives

Mr. Kriang-Krai Mekvanich, Agricultural Engineer

Ms. Puengpit Dulyapach, Agricultural Extension

USAID Mission

Mr. Donald D. Cohen, Mission Director

Mr. Bruce O'Dell, Director, Program Office

7/30/80 Bangkok

Ministry of Commerce, Internal Trade Division

Mr. Chalor Fuang-a-Rom, Deputy Director-General

Field Visit, Central Provinces

Provincial Water Works Authority

Mr. Sitthichai Pissanthanaporn, Rural Water Supply Division

7/31/80 Bangkok

Dr. Chulapongs Chullakesa, Director, Office of Rural Electrification,
Provincial Electricity Authority, Ministry of Interior