SANITATION PROGRAM DEVELOPMENT FOR RURAL THAILAND IN RELATION TO THE INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

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ABSTRACT

The sanitation level in the villages of Thailand is still generally low despite the past efforts of the Sanitation Division of the Department of Health. Consequently, the Royal Thai Government (RTG) is embarking on a national sanitation program with a view to minimizing the occurrence of excreta-related diseases in the rural communities, which will be implemented together with the rural water supply program, so as to produce the optimum effects on health. This dual program, otherwise known as the "Thailand Decade Plan," will be initiated in 1985 and will continue until the end of 1991. The realization of this plan will serve as Thailand's commitment to the International Drinking Water Supply and Sanitation Decade (IDWSSD).

With only 2.8 million pour-flush (PF) latrines installed up to the end of 1983, accounting for 44.3% of the total number of households, the plan calls for the provision of an additional 2.5 million PF latrines in order to achieve the target, which is to provide 75% of households with PF latrines by the end of 1991. Considering the attitudes and economic status of the Thai rural people, the proposed strategies for the implementation of the sanitation program will be the provision of material subsidies and/or "revolving funds," with strong support from such activities as health education, especially for women and children, and the necessary training of personnel. Implementation of the plan will require an investment of approximately Baht 1,792.6 million (roughly U.S.$ 66.4 million).

KEYWORDS

Water-borne and -related diseases, rural water supply, sanitation, excreta disposal methods, pour-flush latrine, social attitudes, Decade Plan.

INTRODUCTION

The 1980 Population and Housing Census in the Kingdom of Thailand reported a population of 44.8 million, of which 83% were rural. Generally, communities with a population of less than 5,000 are regarded as villages, and there are more than 50,000 such villages in the country. This means that the real prosperity of the Kingdom depends on the development of these rural communities.

In line with the overall development objectives of the Royal Thai Government (RTG) is the improvement of the quality of life of the rural population. One way to achieve this goal is to raise the standard of public health through the provision of water supply and sanitation services. Although vigorous efforts have been made in the past to extend these basic services, a considerable number of households still lack access to clean water and proper toilet facilities, a situation which exposes them to a wide range of water-borne and -related diseases (about 40% of all reported cases from 1978 to 1981), and limits their economic productivity.

WWST 18:7/8-8

51
Based on the data obtainable from the "National Census of Rural Drinking Water Sources and Latrines" which was undertaken by Mahidol University, and the annual reports of the various RTG implementing agencies, it was revealed that by the end of 1983 only about 5.2 million people, accounting for 15% of the rural population of Thailand, have been served by adequate and sanitary sources although approximately 85% of the entire rural population already had access to adequate sources (i.e., facilities capable of providing water the whole year round).

On the other hand, the report from the Department of Health showed that up to 1983 about 2.8 million pour-flush (PF) latrines, the most acceptable form of excreta disposal facility, have been installed in the rural areas of Thailand, serving approximately 44% of the total rural households outside municipalities. Other types of sanitation facilities are also in existence, but in limited numbers.

**TABLE 1 Sanitation Facilities in the Rural Areas of Thailand (1983)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Households Outside Municipalities</th>
<th>Biogas Digesters</th>
<th>DVCFF Latrine</th>
<th>PF Latrine No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>1,645,372</td>
<td>800,309</td>
<td></td>
<td></td>
<td>48.6</td>
</tr>
<tr>
<td>Northeast</td>
<td>2,308,022</td>
<td>910,763</td>
<td></td>
<td></td>
<td>39.6</td>
</tr>
<tr>
<td>Central</td>
<td>1,526,273</td>
<td>864,380</td>
<td></td>
<td></td>
<td>56.0</td>
</tr>
<tr>
<td>South</td>
<td>798,531</td>
<td>217,210</td>
<td></td>
<td></td>
<td>27.2</td>
</tr>
<tr>
<td>Whole Kingdom</td>
<td>6,278,198</td>
<td>2,455</td>
<td>400</td>
<td>2,782,662</td>
<td>44.3</td>
</tr>
</tbody>
</table>

The RTG has, therefore, committed itself to an extensive program designed to install a safe and dependable water supply and sanitation facilities within easy reach of the majority of rural households in the shortest practicable time and in the most cost-effective manner. The preparation of the national Masterplan for Rural Water Supply and Sanitation endorses this commitment. The Masterplan also reflects the RTG's positive response to the directive of the United Nations for the governments of all nations of the world to devote more resources towards the provision of clean water and adequate sanitation during the decade of 1981-1991, which has been designated as the "International Drinking Water Supply and Sanitation Decade (IDWSSD)." The Decade Plan of Thailand, as embodied in the Masterplan, follows closely the objectives of the IDWSSD, which is the essential first stage of the "Global Program of Health for All by the Year 2000" launched by the World Health Organization (WHO).

This paper deals mainly with the important aspects of the development and planning of the sanitation component of the Thailand Decade Plan, with a view to formulating the basic strategies for the national sanitation program and delineating the equally important support activities.

**SURVEY OF EXISTING CONDITIONS**

**Effects of Deficiencies in Water Supply and Sanitation Services**

A major objective of the national rural water supply and sanitation program is the improved health of the people, especially among the poor rural dwellers. The absence of continuously available safe water supplies in sufficient quantities is a serious constraint to healthy living. The low sanitary standards associated with prevailing methods for the disposal of human excreta and other waste also constitute an equally serious problem. Inadequate facilities for excreta disposal actually reduce the potential benefits of a satisfactory water supply by transmitting pathogens from infected to healthy persons.

Diseases associated with a deficient water supply and sanitation still prevail throughout the country, notably gastroenteritis, dysentery, viral hepatitis, parasitism, para-typhoid and typhoid fever. In particular, gastrointestinal infections and parasitic diseases are prevalent and affect about one-third of the entire population every year. While epidemics of water- and food-borne diseases have been attributed to contaminated water supplies, the endemic base results from a combination of poor personal and domestic hygiene, unsanitary disposal of excreta and inadequate food sanitation.
Excreta Disposal Methods of the Thai Rural People

**Simple pit latrine.** This is the cheapest type of latrine existing in the rural areas of Thailand. It may cost nothing where superstructure and lining of the pit are not necessary. It is usually a make-shift structure, with a shallow unlined hole, and some minimal provision for footing and privacy protection. In this form, the latrine is very unaesthetic since the excreta in the pit are fully visible and user's privacy is not adequately protected. Still worse, fly and odor nuisances are intolerable, and there is great danger of disease transmission through insect and rodent vectors and through soil and groundwater contamination. There is also a danger of falling into the pit, due to eroded footing, and it is unlikely that children have ever used this type of latrine.

The pit latrine design as such is not satisfactory and Thai users certainly have objections to it. Some modifications at nominal extra costs can be made which result in the ventilated improved pit (VIP) design, and this is a significant improvement over the simple pit latrine.

**Pour-flush (PF) latrine.** This type of latrine is the most well-known and widely used in Thailand. The PF latrine is very much cheaper to build than the conventional cistern-flushed toilets. The construction cost ranges from Baht 440 to 3,000 (1 U.S. dollar is equivalent to approximately 27 Baht), depending on the material used for the superstructure.

The fact that a large number of PF latrines are being satisfactorily adopted by the Thai people and that the Thai design has also spread to several neighboring countries (such as Malaysia and Bangladesh) confirms the reliability of the PF latrine. Perhaps the conditions for the widespread implementation of the PF latrine are more favorable in Thailand than in many other countries. In Thailand, the private sector has played a strong supportive role by manufacturing its components. PF latrines are so varied that the user can have a wide choice according to how much he can afford. The design concept of the PF latrine is both economical and technically sound, and consequently user satisfaction is virtually guaranteed. In short, the affordability and appropriateness of the PF latrine are beyond doubt.

**Double-vault composting pour-flush (DVCPF) latrine.** The estimated total construction cost of a DVCPF latrine ranges from Baht 1,200 to 3,000. It is more expensive than the PF latrine because two water-tight vaults have to be built.

The DVCPF latrine is essentially a resource recovery system, where excreta (feces and urine), cleansing materials and flush water are composted together under wet conditions. The contents are stored in a water-tight vault to be used as a liquid fertilizer (i.e., without drying). The system has worked well in countries such as China, India and Vietnam, where the handling and use of nightsoil has become a traditional practice among farmers. In contrast, Thai rural people are very adverse to nightsoil composting, and it is extremely difficult to introduce this practice to the local people who have a marked distaste for this type of processing. It would obviously not be appropriate to build a DVCPF latrine where its purpose as a means of resource recovery will not be fulfilled. It is simply not logical to spend extra money to build a latrine with a strong, water-tight vault if the effluent is not to be used to bring benefits and simply presents disposal problems. Rather, the absorptive capacity of the soil should be exploited as much as possible to minimize the problem of final disposal, and to reduce the cost of the latrine, since the building requirements for such a vault will be appreciably reduced. If nightsoil is not going to be used as a resource, it is clearly more appropriate to build an ordinary PF latrine.

In short, in the Thai situation the DVCPF latrine possesses some serious defects, namely: (i) it cannot serve its intended purpose, but in fact creates disposal problems, (ii) it is expensive, and (iii) it is not socially acceptable due to its complicated use (alternating between two vaults) and the requirement for manual handling of the effluent.

**Biogas digester.** This is an option for the recycling of wastes other than excreta. The cost of a unit is about Baht 5,000, which is quite high for ordinary rural people in Thailand.

Generally digesters have failed in Thailand not because of the technology itself, but rather because of the way the technology was introduced and implemented. Various socio-economic conditions combine together to make biogas less desirable. The overall consequence is that a high proportion of the biogas digesters which were constructed have been abandoned or misused. In one interview, one-half of the non-users stated that they had constructed their digesters just to please the government's promotional officials. This clearly shows that the people do not appreciate or understand this technology.
Social Attitudes Regarding Sanitation

Social attitudes towards using the latrines is very important. In some situations, improving household sanitation becomes compulsory, and the law may support and enforce it. Some households must be sufficiently interested to agree to the change.

Among the constraints to user interest in low-cost sanitation is the "social indulgence" of traditional practices where others simply pay no attention to someone squatting in the field or the bush. Another factor which limits interest is the greater concern often shown for other things, such as improvements in the water supply (in many rural areas water is scarce) or simply better food and clothing. Still another constraint is the fact that other natural alternatives (such as open fields, bushes, water courses, etc.) are easily accessible, cost nothing, are reliable and have been used for so long by their ancestors that people see nothing particularly unpleasant about them.

On the other hand, factors which have been found to encourage people to seek improvements include: the desire for privacy (especially for women); the prestige value associated with having such services; the increasingly crowded living conditions which limit access to private open space; and concerns about adverse effects of a polluted environment on one's health and the health of one's family.

SANITATION PROGRAM PLANNING AND DEVELOPMENT

Recommendations on Appropriate Sanitation Options

The discussion on the existing excreta disposal methods has given some hints on the strategy for implementing the various sanitation options. The conclusion here is quite straightforward and can be summarized as follows.

Mainstay options. With an inadequate water supply for toilet flushing, the need is for VIP latrines - with initial pilot projects for field study and feedback collection. This is an urgent task which needs to be started as soon as possible in order to achieve a design effective for the conditions pertaining in Thailand. When a water supply has been made available, the VIP latrine can be upgraded to a PF latrine.

With an adequate water supply for toilet flushing, PF latrines will be widely implemented straightaway - with guidance from all levels of the authorities concerned and the current supportive role of local manufacturers for the supply of latrine components, as this is the type which is preferred by the villagers.

Pilot application followed by batch development. The DVCPF latrine, biogas technology and composting can be studied with a view to establishing their technical and economic viability. Then these methods may be applied in pilot projects in limited areas so that their performance in field conditions can be tested. Most likely the implementation of these options will ultimately be confined to isolated locations rather than becoming nationwide in their scope of application.

It is obvious that the upgrading of sanitation options is closely linked with the level of the water supply, and this determines the choice between VIP and PF latrines. Furthermore, where water is consumed in large amounts, the environment cannot cope with a large flow of greywater generated from a community, and so the PF latrines which have been built become inadequate. Therefore, upgrading cannot be limited to sanitation features alone but should be considered as part of an integral approach covering all interrelated factors.

Needs for Hygiene Education

Because no improvement in public health is likely to take place without proper utilization of sanitation services, it is imperative that promotion through hygiene education should be considered as one of the most important components of the rural sanitation program. Hygiene education will aim to enhance the involvement of the villagers not only in the continual use, but also in the care of sanitation facilities, thus contributing to the success of the program.

Hygiene education for children and young people. Explaining to younger generations the importance of building a healthy society is vital, and consequently they must learn more about
human excreta disposal and personal hygiene, in addition to accident prevention, food sanitation and household sanitation. School education program generally offer learning opportunities for children. Children are more receptive to new ideas than adults, so the school premises may well be the most suitable institution for acquiring adequate initial training, and in particular for changing the children's habit from open defecation to controlled excreta disposal.

The school curriculum on hygiene and sanitation can also be further enhanced by practices in proper use of latrines if these are built on the school premises. Moreover, the experience and information gathered by the children through the use of latrines in school and through hygiene education will be passed on by the children to the adults in their community, and to other children who do not have the benefit of a formal education. Hence, attention should be paid to latrines for schools, and an allocation of resources should be made for this purpose.

Hygiene education for women. Women are usually the managers of household water supplies, being the primary users and the mediators between the water source and the household requirements (for food preparation, washing, bathing, etc.). Their role in household sanitation and family health is equally important. Women are usually responsible for obtaining water and seeing that it is available for daily use. Likewise, they need a latrine more than men and children, since they are in charge of keeping the latrine clean and making sure that it has sufficient water for flushing.

It is quite possible that a "medical revolution" could take place if rural people - particularly children - learn to wash their hands after defecation and before eating. In the family, only the woman will normally be responsible for this education. If children are to be encouraged to use the latrine, women will play the most important role in forming this habit.

While playing such vital roles, women are seldom allowed to be involved in the process of making decisions which directly affect their responsibilities, and they often are not singled out for the intensive user education which is so necessary for project success. This anomaly should cease, and women should be considered as important users, trainers and educators - perhaps more important than men!

Sanitation Demand Forecast and Feasibility Study for Service Areas

The 5th National Five-Year Development Plan sets out that 70% of the rural population will be served with adequate sanitation facilities by the end of 1986. This target has also been adopted by the Sanitation Division of the Department of Health for its main policy in the implementation of the national sanitation program. In addition, it is intended that a much higher coverage be achieved in the 6th National Five-Year Development Plan, i.e., 95% by the end of 1991.

Since only about 44% of the total number of rural households had installed PF latrines up to 1983, there is at present an urgent need to construct more sanitation facilities if the desired health objectives and other related environmental impacts are to be effected. In order to achieve the official targets it will be necessary to install 1.84 million PF latrines by the end of the 5th National Five-Year Development Plan, and another 2.2 million by the end of the 6th National Five-Year Development Plan. This amounts to around 600,000 latrines per year. Looking back at the past performance, the target was usually set at 400,000 per year, but even this target was never achieved.

Many countries have experienced bitter failures due to hasty implementation of their sanitation and water projects on a large scale. To avoid similar experiences in Thailand it is imperative that the national targets should be readjusted to cope with problems arising during implementation. In this regard, a reduction of the coverage to 55% and 75% for the 5th and 6th National Five-Year Development Plans respectively is proposed for the Masterplan formulation. It should be noted that different targets have been set for different regions. This takes account of the reality that discrepancies in user awareness and affordability or program feasibility exist among the four regions. While equality among regions should be promoted, exactly equal development among them is not a realistic objective.

It should be noted that interest in improved latrines will vary between different sub-groups in a given project area, with the richer and better educated families generally being more anxious and ready to participate. Women are sometimes more interested than men - whereas men, and not women, are involved in the decision-making processes. Such differences should be taken into consideration in the implementation of the program, as they are likely to affect the types of people that the program will serve, at least initially, and also affect the rate at which the improvements can be expected to take place.
Financing

Careful observations of the way of living in Thai villages revealed that while it is true for many cases that non-existence of a latrine was due to its unaffordability, the main reason for the lack of latrines is the unwillingness to pay as a result of lack of awareness and felt need. The villagers simply do not think that a latrine is an essential part of their life, and instead give priorities to, for instance, agricultural machinery and equipment, which bring perceivable benefits, and to owning a radio, a TV set or even a motorcycle, which bring life amenities and satisfaction.

As stated previously, women feel a need for a latrine, but nevertheless, they are normally not involved in the decision-making process, both at the household and community levels.

Considering the attitudes and economic status of the rural people, it is necessary that a sensible subsidization scheme should be drawn up, and it should be preferably a compromise between (i) no subsidization at all - as is the current practice, which does not provide incentives and encouragement while user awareness is still lacking and takes time to induce; and (ii) full subsidization, which leaves no room for the sense of ownership and responsibility while creating huge financial burdens on the authorities.

Thus in the implementation of the envisaged national sanitation program, the main strategy being contemplated is the provision of material subsidies and/or "revolving funds," with strong support from such activities as health education, especially for women and children, and training of necessary personnel like the village health communicators/village health volunteers (VHC/VHV), village sanitation craftsmen (VSC) and tambon (sub-district) health workers (THW).

The provision of material subsidies means giving recipients (identified as poor rural households) the essential materials to construct PF latrines. The essential materials will consist of four items, namely the squatting plate, the concrete rings, the asbestos concrete pipe and the cover slab, which are estimated at Baht 440. This incentive should stimulate the awareness of rural people regarding the importance of latrines, and can be considered as a form of motivation for the villagers to accept the program. It is then presumed that labor and other materials for complete construction of the toilet will be borne by the recipient households out of their enthusiasm for the project. This form of subsidies is an innovation applying only to the government's sanitation program.

"Revolving funds," mainly for sanitation projects, will come in the form of a loan of Baht 500 and will be provided to interested householders who are unable to finish the construction of their latrines without further financial assistance, or to those householders not entitled to receive the material subsidy but who want to construct their own latrines. The repayment period will be 10 months.

The Village Committee, in close collaboration with the Tambon Health Worker, will submit to the Tambon Council the names of householders who are to be provided with the subsidies. Priority will be given to the poorest.

PROPOSED RURAL SANITATION PROGRAM

Program Description

The proposed rural sanitation program corresponds to the different activities to be carried out during the implementation of the Decade Plan between 1985 and 1991. This includes toilet construction, training, health education, and research and development (R&D).

Toilet construction. The aim will be to increase the availability and use of sanitary latrines by installing an additional 2.5 million latrines, mainly pour-flush (PF) types, in the rural areas of Thailand before the end of 1991, to serve 2.5 million households. This will be implemented through the provision of material subsidies and/or revolving funds by the respective village committees.

Training. The aim will be to provide knowledge and skills to different levels of sanitary technicians as well as village leaders so that they will be able to plan, promote and strengthen the national sanitation program. To achieve the objectives of the national Decade Plan, it is important to utilize the available manpower resources in the locality. Therefore different groups of people who are interested in water supply and sanitation activities will be selected and trained at different levels. During the training, per diem and transportation costs will be
Sanitation program development

Between 1985 and 1991, it is estimated that the national training program will cover about 689,000 village health volunteers/village health communicators (VHV/VHC), 90,816 tambon council committee (TCC) members, 46,008 village sanitation craftsmen (VSC) and 1,424 tambon health workers (THW). In addition, personnel from the relevant RGV agencies and target groups at different levels will be called for meeting/workshops in relation to program objectives and policies, and the organization and management of community activities.

Health education, information and communication. As sanitation emphasizes the promotion of new ideas, it is necessary to design appropriate methods for imparting messages which will enhance the awareness, the understanding and the interest of the villagers and motivate them to improve community sanitation and personal hygiene. It is essential for villagers to participate in keeping their environment clean. To underscore the importance of proper excreta disposal and personal hygiene, health education, information and communication should play a very important role in community preparation and in the implementation of water supply and sanitation activities.

Educational activities will include the provision of health education to village dwellers, especially women, through the mass media, and by means of health educators and other responsible personnel for disseminating information relating to water standards and the importance of sanitation. In the villages, this can be effectively carried out by field workers, such as THW, VHV and VHC, through face-to-face communications, in particular the VHV and VHC who are themselves village residents.

Similarly primary schools in each tambon should have at least a sanitary latrine on the school premises to be used by the school children. This is to inculcate in young people the habit and proper use of latrines - and, hopefully, these children in turn will convince their parents to have their own latrines.

Programs for radio and television should be introduced. Government and non-governmental publications and posters should be circulated as well. An alternative way would be to arrange for mobile units to bring movies and slide shows with sanitation themes into target villages so as to show people how to observe good hygiene and sanitation. A film show should be followed by small group meetings and house-to-house visits. Posters promoting the Decade program with regard to excreta, water and diseases should also be distributed to the community during these events.

Research and development (R&D). This will consist of support activities of all the technical and administrative aspects of the sanitation program. Priority should be given to providing appropriate technology and testing it under field conditions.

Out of the various sanitation options under consideration, only the PF latrine can be considered as an "established" type. Therefore, the PF latrine can be implemented straight away, with promotional efforts to induce community awareness and participation. For VIP and DVCPF latrines and for biogas and composting, technical information and data exist which make it possible for pilot projects to be conducted applying these technologies.

The economic and social aspects of any option should be investigated in detail, with geographical variations in mind. Such investigations have not been sufficiently thorough in the past, with the exception of some recent sociological studies, i.e., KAP (knowledge, attitude and practice).

Investment Requirements

For the implementation of the envisaged sanitation program in Thailand a budget allocation of approximately Baht 1,792.6 million will be needed, broken down as follows (in million Baht):

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost (Baht)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet construction:</td>
<td></td>
</tr>
<tr>
<td>- material subsidies</td>
<td>1,095.6</td>
</tr>
<tr>
<td>- revolving funds</td>
<td>350.0</td>
</tr>
<tr>
<td>- VHV, VHC</td>
<td>171.6</td>
</tr>
<tr>
<td>- TCC, VSC, THW</td>
<td>122.4</td>
</tr>
<tr>
<td>- seminars/workshops/etc.</td>
<td>13.8</td>
</tr>
<tr>
<td>Health education:</td>
<td></td>
</tr>
<tr>
<td>- latrines in schools</td>
<td>11.2</td>
</tr>
<tr>
<td>- posters, leaflets, etc.</td>
<td>7.0</td>
</tr>
<tr>
<td>- mobile units</td>
<td>14.0</td>
</tr>
</tbody>
</table>

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Sources of funding may come from purely governmental sources, or may be solicited from international agencies/organizations.

**Institutional Requirements**

The sanitation sector is already organized within a well-defined, comprehensive and centralized structure with a number of workable schemes of decentralization and local participation underway. Moreover, the proposed sanitation program for the national Decade Plan does not require any drastic departure from the existing one. In short, the current institutional set-up is quite capable of accommodating the proposed sanitation program without radical modifications.

However, the success of implementing the envisaged sanitation program will require cooperation from other related RTG agencies. For example, the Health Education Division in the Ministry of Public Health will have to coordinate with the Ministry of Education to design a proper health education curriculum for schools. Also community preparation in relation to the program through the village leaders will need the help of development workers from the Department of Community Development under the Ministry of the Interior.

**CONCLUSION**

Improved community water supply and sanitation can have a wide ranging impact on the health, economic status, and the social and environmental setting enjoyed by rural people. But the most evident direct benefit is the improvement of health, and this is the aspect which Thailand wants to improve for its millions of rural people during the implementation of its own Decade Plan.

Since the PF latrine is the backbone of rural sanitation in Thailand, it can be readily seen that sanitation programs rely on the status of the water supply as a prerequisite. Hence, the provision and upgrading of sanitation is planned in conjunction with improvements in the water supply.

In the implementation of the envisaged sanitation program in the Thailand Decade Plan, the main strategy which has been adopted is the donation of material subsidies and/or revolving funds coupled with mass education by trained personnel. Although the proposed plan is technically feasible, economically justified and financially viable, it may be necessary to make some changes in the details of the plan in accordance with any new conditions which may arise. To cope with such contingencies there should be an effective mechanism for monitoring the program so that a post-evaluation (or a "before-and-after" study) can be made based on adequate feedbacks.

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**REFERENCE**