

**Irrigation Management Issues in
Sustainable Irrigated Agriculture Project,
Laos and Thailand**

Nouanedeng Rajvong¹
Nguyen Hong Toan²

INTRODUCTION

THE SUSTAINABLE IRRIGATED Agriculture Project (SIRAP) 1992-1996 has been established to provide support for irrigation scheme improvement (infrastructure, operation and management) and agricultural development in 65 existing (almost all small scale with irrigation area of 100-400 ha) pumped irrigation schemes in 7 provinces in Northeast of Thailand and 3 provinces in Laos along the Mekong River and its branches. Total irrigation area is around 322,000 ha, as shown in [Figure 1.]

Irrigated agriculture is poorly developed in Laos, with only about 2.5 percent of the total rice production being produced within medium-and large-scale, "public sector-managed" irrigation schemes. Of the total land area under irrigation, some 88 percent is supplied with water from small schemes (command areas less than 100 ha) that have been developed and managed by farmers and community groups. There is considerable scope for the construction of new small-scale schemes from which the benefits are particularly attractive, if constructed in areas where they are able to reduce the negative environmental impact of shifting cultivation. Small pump schemes are primarily oriented towards dry season production and schemes of less than 100 ha are generally within the capacity of the farmer community group to operate simple operation and maintenance (O&M) and water allocation systems.

In Thailand, the total area within the project schemes is about 24,000 ha, involving some 11,000 farming households or about 57,000 people. Poverty in the region is due mainly to water resource constraints, while poor soils and marketing problems further aggravate the situation. Irrigation schemes in the project include one medium-scale and 34 small pumped schemes that have generally been designed for wet season rice. Increasing agricultural production requires that dry season crops be extended in which the role of irrigation becomes vital. Effective farmer organizations, capable of undertaking efficient system operation, water management and system maintenance, are needed to achieve these requirements.

The project idea stemmed from the fact that in the project area little attention was paid to the strengthening of farmer organizations as a means to maintain these irrigation schemes. No adequate support was given to farmers in the field of scheme O&M and crop water management. Various schemes were also hampered by a lack of attention to institutional aspects (markets, credit and government support) for sustainable irrigated agriculture.

The immediate objectives of the project are as follows:

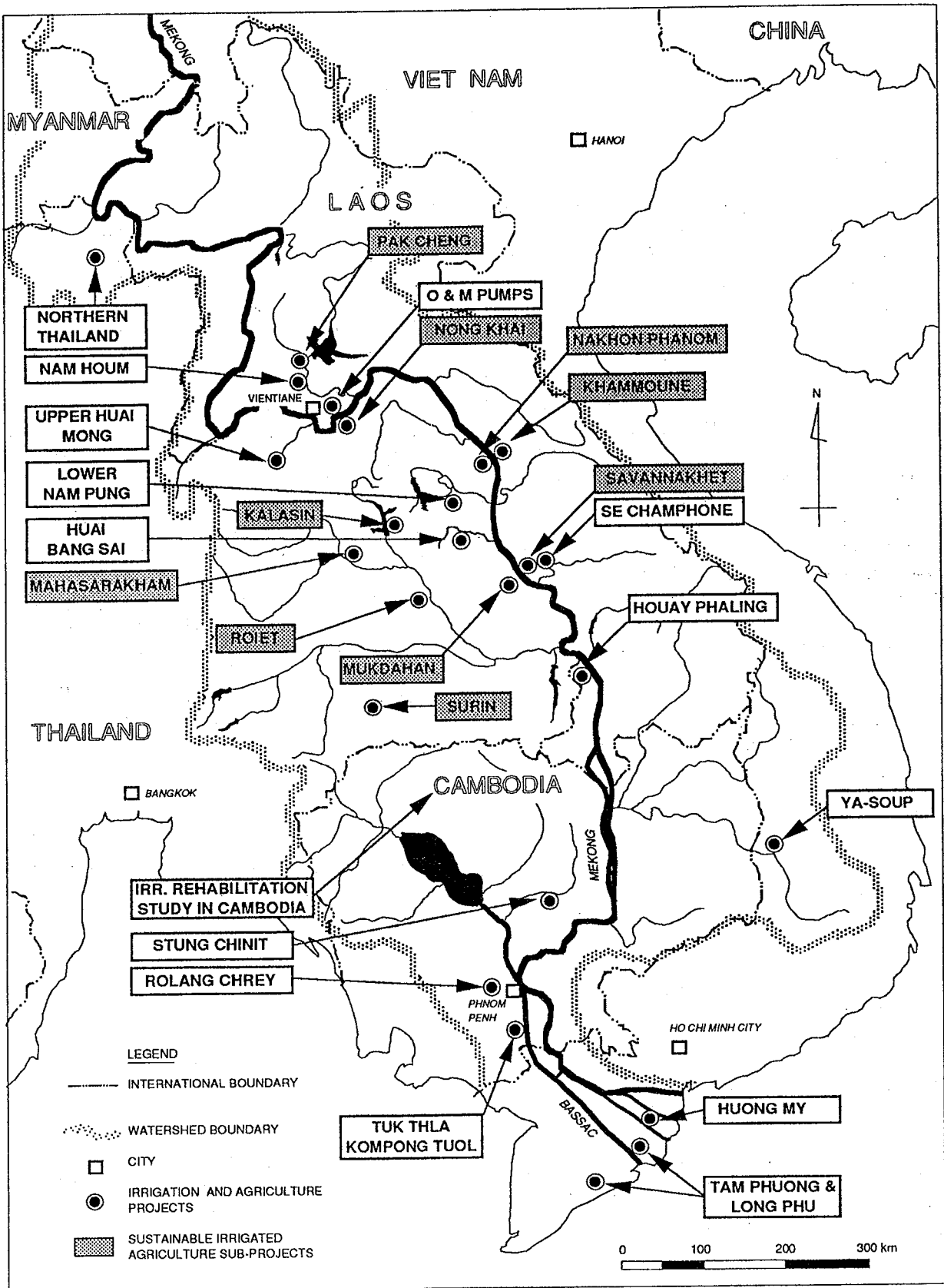
1. To improve conditions for viable and sustainable agricultural development in 65 selected irrigation schemes in Laos and Thailand through a program of training, demonstration, advisory services and monitoring in farmers' needs analysis, organization strengthening and action planning, irrigation system improvement, crop production and marketing.
2. To strengthen the capability of Lao and Thai national agencies involved in analysis, planning and implementation of irrigation development in 10 selected provinces, through a program of training, advisory services and monitoring.
3. To increase regional cooperation in irrigated agriculture in the lower Mekong Basin, particularly through trans-Mekong exchange programs for provincial agency staff and farmers between Laos and Thailand.

With the above-mentioned objectives, SIRAP Project is being treated as a pilot project for the development of about 750,000 irrigated hectares in Thailand and 30,000 hectares in Laos. These irrigated areas should produce rice and field crops for the increasing urban population as well as for export, and reduce the ecologically undesirable pressure on rainfed land of the slash-and-burn system (in Laos).

¹Director, Lao National Project.

²Project Officer, Mekong Secretariat, Mekong Committee.

Figure 1. Irrigation and agriculture projects.



PROJECT STRATEGY: THE PARTICIPATORY APPROACH

[To achieve sustainability of irrigated agriculture which is very much related to the irrigation management transfer issue, the concept of the participatory approach to development is to involve the members of the target groups for development in all planning and implementation in order to:]

- * Inform and motivate them.
- * Have their ideas and solutions to problems incorporated in the scheme plans.
- * Develop viable irrigation schemes, technically, economically and socially.
- * Achieve sustainable water user and agricultural groups.
- * Permit the groups to accept responsibility for organization of scheme operation and maintenance.

The concept is simple but deceptively so. Instead of offering a blueprint, members of the target groups are to be involved from the period of initiation of the work, preferably even in the phase of working out ideas. This involves explaining the ideas, organizing groups, group discussions, changes in ideas and further discussions until consensus is reached. The more complicated the proposed technology is, the more explanations and discussions are needed.

Irrigation management in this project is a complicated matter both in the two reservoir irrigation schemes and 63 pump irrigation schemes, especially the latter because of the higher O&M costs involved and the consequent need for a stricter organization. It needs a complicated set of rules, rights, obligations and penalties, plus an administration system with authority to enforce them.

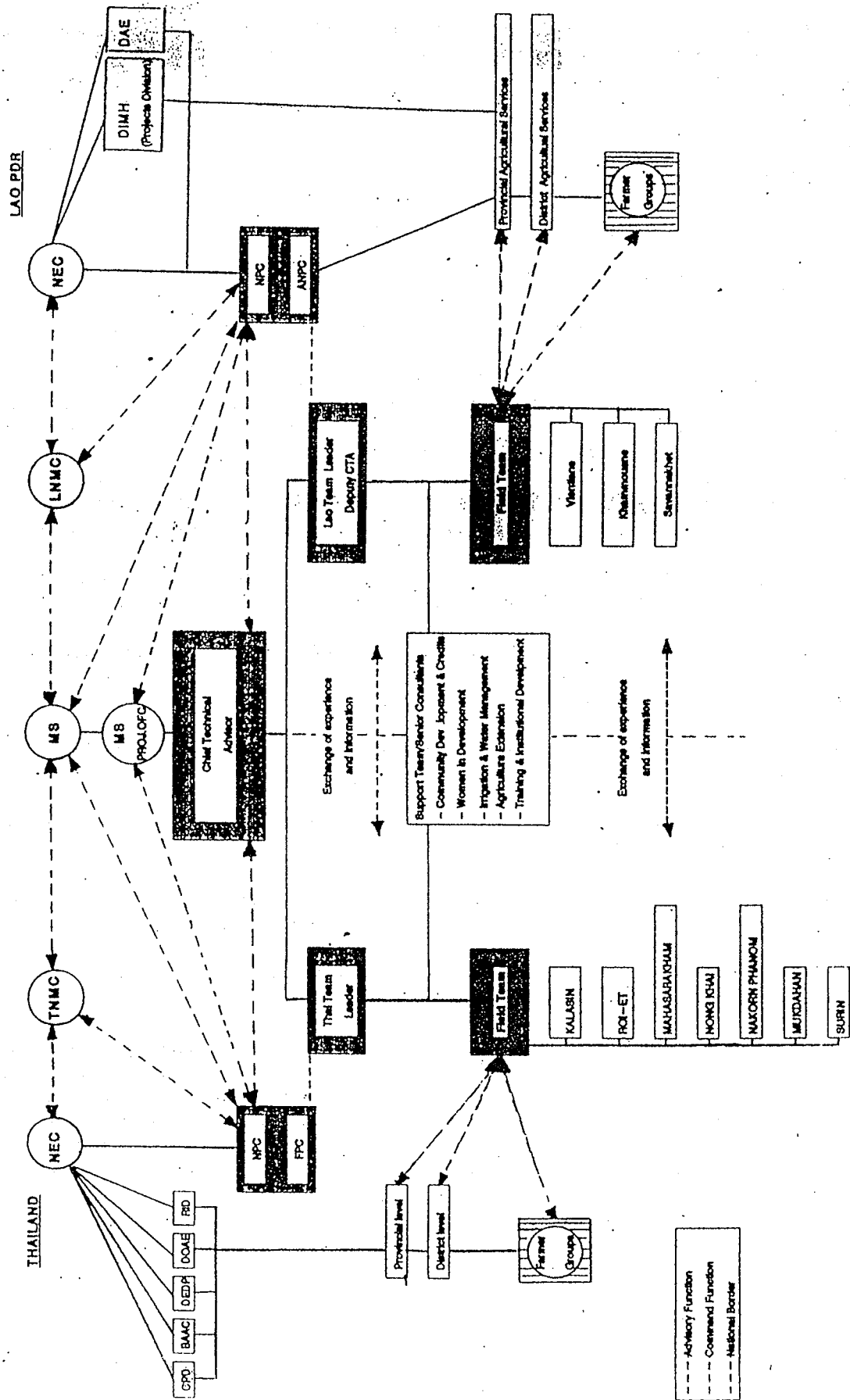
Another implication for participation is that "top-down" and dependency attitudes must change to "cooperation-in-development" approaches. Results have repeatedly shown that office solutions cannot guarantee acceptable field solutions.

To achieve sustainability of irrigated agriculture, the farmer organizations (water user groups--WUGs) which will be established or re-established are not only involved in water management but also engaged in agriculture extension. Through encouragement and training, these groups should become capable of the following:

- * Managing their own systems, i.e., responsible for organizing and implementing all the operational and maintenance activities of the scheme.
- * Securing supply of credit and inputs, i.e., able to negotiate and make decisions on the sources of credit and inputs required for crop production.
- * Having access to markets and market information, i.e., able to make decisions on which crops to grow for which market and to negotiate contracts with buyers, based on good market information.
- * Adapting to changing economic and social changes, i.e., able to change ideas and cropping systems, in line with changing economic and social developments.

The SIRAP Project is funded by the Government of the Netherlands through the Mekong Committee. The organizational structure of the project can be seen in [Figure 2]. In Laos there are two departments to implement the project: Department of Irrigation (DOI) and Department of Agriculture and Extension (DOA). In Thailand there are five departments: Department of Agricultural Extension (DOAE), Department of Energy Development and Promotion (DEDP), Royal Irrigation Department (RID), Cooperative Promotion Department (CPD), and Bank for Agriculture and Agricultural Cooperatives (BAAC). The afore-mentioned organizational structure was aimed to facilitate the process of Irrigation Management Transfer (IMT).

Figure 2. Organization chart, SIRAP.



IMPROVEMENT OF INFRASTRUCTURE

The project used the Rapid Rural Appraisal (RRA) method to assess problems of the farmer groups and, especially, their willingness and readiness to resolve these problems and undertake development. The specific situation and problems of each scheme and its organization have then been used as a learning situation, i.e., with a fresh view on problems and possible solutions facilitated by extension workers.

The project intervened with the schemes at varying levels of support. [Depending on the readiness of the farmer groups to develop their irrigation schemes and taking into account available means and manpower of the project, an irrigation scheme plan was developed for each scheme].

The project distinguished two kinds of schemes. The first called **intensive scheme** referred to a scheme receiving full support from the Technical Assistance Team (External Fund), national agencies, and farmer groups; and the second was **extensive scheme** receiving only limited assistance from TA team. Nine schemes were selected as intensive schemes and some of them will be selected to be transferred to be under farmer group management.

The participatory approach was applied for the infrastructure improvement for both design and construction of on-farm structures in the intensive schemes. The design was developed in consultation with the farmers prior to being approved for construction. Labor-based construction was widely given attention. The work that was complicated or had to use construction equipment was done by a contractor, but under the joint supervision by farmer groups, government staff or field staff of the consultancy team. A small work volume or simple rehabilitation work was given to farmer groups. The project provided the construction materials and a small daily allowance. During a period of two years (1993-94), 60 per cent of the total construction budget for on-farm development (US\$600.00) was expended through the farmer-supervised and labor-based construction. In Thailand, the on-farm development in one medium-scale reservoir irrigation scheme was fully carried out by the farmer groups.

INSTITUTIONAL STRENGTHENING

This is one of the most important of SIRAP's activities, which governs and consolidates the output of the other activities. The term "institution" in the context of SIRAP includes all government institutions at all levels with particular attention to the provincial and district levels and farmer organizations. The total amount of US\$1.2 million was approved for the institutional strengthening activities of SIRAP.

Government Organizations

As mentioned in the SIRAP Organization Structure, in Thailand there are five departments involved with SIRAP, whereas, in Laos there are two. The role of these departments can be seen in Figures 3 and 4.

Farmer Organizations

In Thailand, most government-administered farmer organizations have limited activities and are mainly engaged in channelling government subsidized credit and fertilizers. Differences in functioning between farmer organizations are often related to the quality and motivation of farmer leaders and administrative government officials. At the start of SIRAP, there were already water user cooperatives (WUCs) and water user groups (WUGs) in the intensive schemes. However, the existence of a WUC or WUG does not mean that it functions as a proper farmer organization. They have been established in a top-down way, and are administered by the Cooperative Promotion Department.

Development of viable farmer organizations with capable leadership and appropriate levels of technology is vital to achieve sustainable irrigated agriculture development. SIRAP activities strongly focus on strengthening the function of these WUGs and WUCs.

In Laos, the provincial authorities have already encouraged the formation of farmer groups (water user groups) in the intensive schemes included in SIRAP. Farmers have gathered themselves in groups for managing and controlling the use of water in their scheme. However, in some villages the WUGs are not operational, because the farmers have no responsibility in the operation of the pumps and in the division of the water supply to the different areas. Their activities are limited to repair of tertiary canals and contribution of labor.

Role of Women

In the process of RRA, SIRAP's field assistants collected information on the role of women in irrigated agriculture which is considered to be one of the support areas for sustainable development in the field of institutional strengthening.

Figure 3. SIRAP Thai activities and agencies.

DOAE	--	Farmer-based agricultural planning (individual and group)
	--	Use of agricultural area analysis in extension
	--	Agricultural extension as a resource networking service
	--	Provincial agricultural planning, monitoring and coordination
	--	Environmental monitoring, training and management
DEDP	--	Main system and on-farm water management
	--	On-farm system improvement
	--	System operation and maintenance
	--	Provincial and regional monitoring, maintenance and management
RID	--	On-farm system improvement
	--	Water use planning and reservoir operation management
	--	Main system operation and water management
	--	Tertiary unit and on-farm water management
CPD	--	Farmers group promotion, strengthening and monitoring
	--	Group's leadership, meeting, reporting and book-keeping skills
	--	Women's activities and organization
	--	Group's preparation for eventual legal registration
BAAC	--	Farmers' access to input supply, credit and market
	--	(For water user cooperative and individual farmers, in connection with Agricultural Marketing Cooperatives)

Figure 4. SIRAP Lao activities and agencies.

AGRI	--	Farmer-based agricultural planning (individual and group)
DEPT	--	Agricultural extension service strengthening
	--	Women's activities and organization
IRRI	--	Main system and on-farm water management
DEPT	--	On-farm system improvement
	--	System operation and maintenance
	--	Water use planning and reservoir operation management
	--	Environmental monitoring, training and management
PROV	--	Community and farmer needs survey and analysis
AGRI	--	Farmers' group promotion, strengthening and monitoring
SERV	--	Group leadership, meeting, reporting and bookkeeping skills
PROV	--	Provincial agricultural planning, monitoring and co-ordination
BANK	--	Farmers' access to input supply, credit and market

In Thailand, it was found that women are quite exposed to the outside world. Their problem is, however, that they have less time to participate in certain project activities owing to household labor constraints. In nearly all villages, there exist (informal to formal) womens groups including Farmer Housewives' Group, Womens' Group, Silkworm Raisers' Group and Traders' Group. It proved that the women gather together only when there are certain activities to be done. Therefore, the need is to define project implementation strategies that would encourage farmer participation and specifically women, recognizing their existing roles and work commitments. For instance, the legislation and regulations of the WUG/WUC should be amended by changing the membership unit from household head to household family.

Due to the hierarchical structure of Thai society, in which personal attitudes of top- and middle-level managers can make all the difference in either supporting or opposing certain policies, workshops for DOAE staff on strengthening extension service by using gender-based analysis were organized.

With regard to strategies to make gender development an integral part of development activities, the workshops were important in raising an awareness of gender issues among senior staff.

In Laos, the project and program working on womens issues have coordinated and cooperated closely with the Lao Womens Union (LWU) which is situated at all levels from the national to the village. At the beginning of the project, the concept of gender was not widely known. After two years of implementation, the situation is changing. Through meetings and training with LWU many changes in attitude from perception to willingness, a new vision on WUO structure taking gender issues into account have been observed. An improvement in womens' participation in the WUO management has occurred.

WATER MANAGEMENT AND AGRICULTURE EXTENSION IN RELATION TO IRRIGATION MANAGEMENT TRANSFER (IMT)

Crop Production Situation

SIRAP Project Area in Laos. Production of rice is the principal agriculture activity both during the wet and dry seasons. During the dry season crop diversity is low, consisting mainly of rice (90%), plus a few other crops, e.g. tobacco, field crops (peanuts, beans, corns) and vegetables.

The production of rice and its yield in the different areas covered by the SIRAP intensive schemes is shown in Figure 5.

Generally, farmers grow rice during the wet season for their own consumption. In the dry season, rice is planted as a cash crop or for family consumption if their wet season crops have failed. Compared to the wet season, dry season cropping is undertaken in a more intensive manner.

SIRAP Project Area in Thailand. Within 34 schemes in seven provinces of SIRAP area, it was determined that in the wet season more than 95 percent of the cultivated land is used for rice production. Approximately 50 percent of the farmer members use some part of their land for growing non-glutinous rice for the market. However, the price of rice in the recent years (1992-93) was unfavorable which has undoubtedly discouraged the farmers to increase their rice production.

Utilization of irrigation facilities in the dry season is also low; cropping intensities range from 25 to 35 per cent. Poor soil condition, inadequacy of water, incomplete water distribution infrastructure, poor water management and lack of sufficient support limit crop diversification.

Water Management. In Thailand, water management can be either by formal or informal organizations. The informal groups are the Water User Groups (WUG) and the formal ones are the Water User Cooperatives (WUC). WUGs which are formed initially will be developed at a later stage to become WUCs. There are 16 schemes with WUGs and 18 schemes with WUCs, within the 7 provinces in which SIRAP is working.

In the small pump schemes, system maintenance is shared between the farmers and the Pumping Service Centers (PSC) of DEDP. PSC is responsible for maintenance of all large structures, the pump and its components and the electrical system. Farmers are responsible for desilting the canals and ditches, grass cutting, construction of new farm ditches and maintaining the embankments.

The established WUCs and WUGs are responsible for the fee collection in the pump irrigation schemes. The water fee is collected from the water user members by the zone leaders then passed to the group chairman and then on to DEDP via the PSC. The fee has changed from being charged on an irrigated area basis to an electricity unit cost basis, i.e., cost per KWh. In general, DEDP charges Baht (Thai currency) 0.60/KWh to the group and therefore subsidizes Baht 1.17/KWh paid by DEDP to the government.

Figure 5. Rice production, growing area and yield.

Irrigation scheme	Wet season rice		Dry season rice	
	Plantation area (ha)	Yield (t/ha)	Plantation area (ha)	Yield (t/ha)
4 schemes in Vientiane	3,089	2.8	738	3.5
Muong Kao	519	1.8-2.2	187	3.5
Ton Hen	927	1.5-2.5	166	2.3-3.6
Na Kae	50	1.5	27	2.5
Thasano	55	1.5	28	2.5
Houay Sakhouang	222	1.5-2.0	51	2.0-2.5

In Laos, the schemes are managed by Water Management or Agriculture Companies (WMC) (if schemes are big and complicated), or by the Farmer Organizations with assistance from the Provincial/District Agriculture Service (if schemes are medium or small size). In fact, the water management by WMC is not efficient. In the scheme managed by the WUGs, normally the district authority assigns one pump operator and one extensionist to assist the farmers in managing the water.

The SIRAP Project is developing three levels of farmer organizations participating in water management as a basis for handing over (see Figure 6).

Agriculture Extension

With the ultimate goal of the project being sustainable irrigated agriculture development in the Northeast of Thailand (the poorest region) and Laos, agriculture extension activities aim to increase crop production, and market opportunities involve the training of government staff at all levels (central, provincial, district) and farmers. Sustainability is the key factor to make WUGs or the private sector agree to take over irrigation schemes from public sector.

Training provided by the SIRAP Project includes information on how to establish WUGs/WUCs, improve and manage them; information on how to involve farmers (men and women) in water management and agriculture production; provision of training courses and demonstrations on agriculture production, and simple guidelines for farmers to easily understand; and access to marketing. The project strategy is to show that after the completion of the project the farmer organizations can achieve a high degree of self-reliance with the support of the government staff.

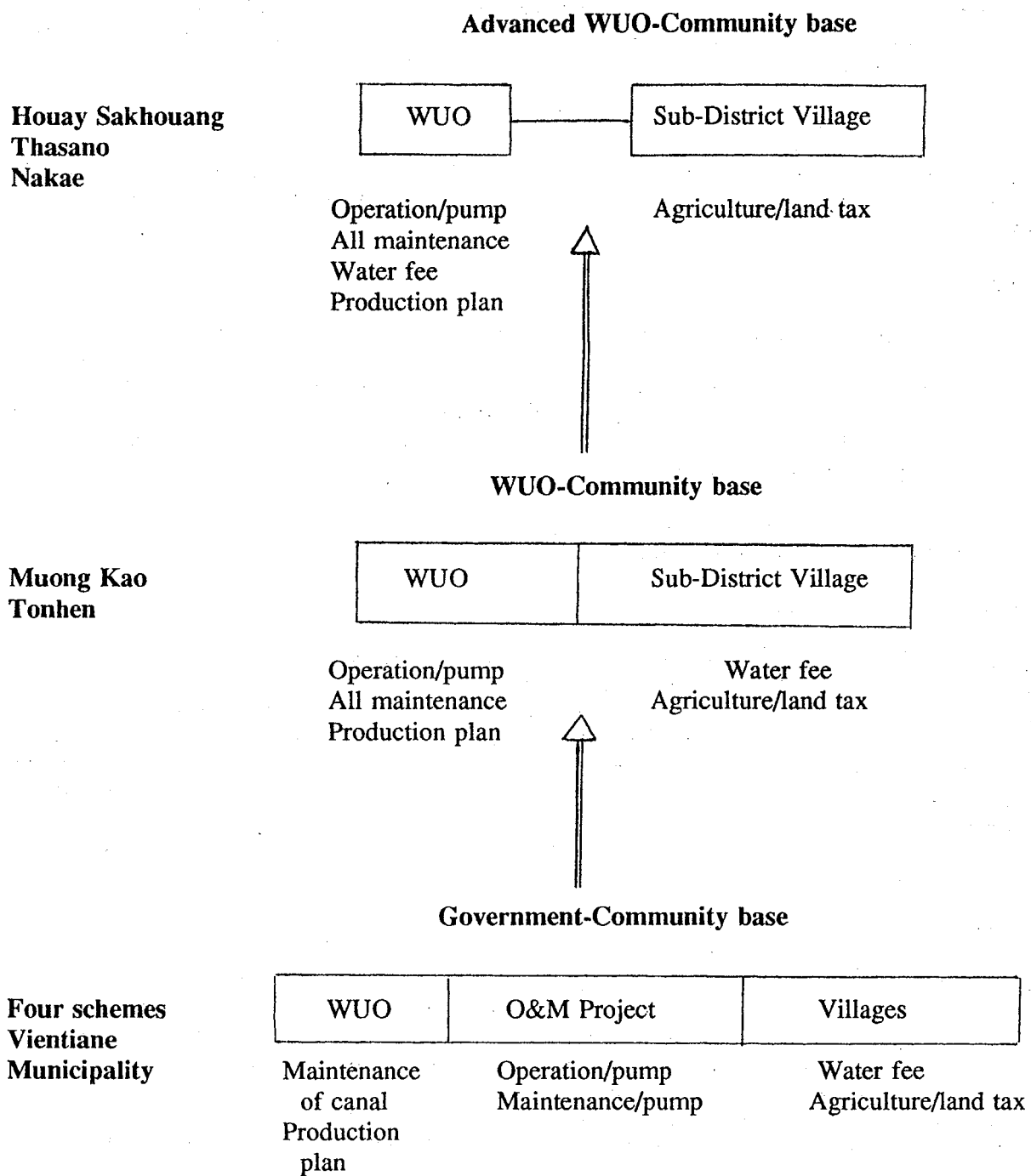
In the Thailand Project area, about 11,000 households are involved in the development of irrigated agriculture in 34 pump irrigation schemes and one gravity irrigation scheme. About 500 organization leaders have to be trained.

In the Laos Project area with 30 schemes and 4,000 household, a total of 250 organization leaders have to be given training.

Concept of Handing over Irrigation Schemes to WUGs

SIRAP Project is being implemented in Thailand and Laos with policy differences in each country. The Government of Thailand has subsidized farmers a lot in order to avoid migration from the countryside to the city. Decentralization in agriculture structure was given attention to increase the role of farmer institutions and government agencies at provincial and district levels. The new policy of the Thai Government on agriculture structure and production system adjustment offers significant encouragement to the farmer-managed irrigation scheme. Due to such a policy, the framework includes farmers' farm-plan formulation and support of farmers' farm-plan. The SIRAP Project lays emphasis on small pump schemes, water management and consideration of social factors of farmer organizations which will play an important role in supporting implementation of the above policy.

Figure 6. Present organization for O&M of irrigation schemes in SIRAP Laos.



The Lao Government is being burdened with a shortage of funds for the maintenance of irrigation schemes. Therefore, the Lao farmers in all schemes are requested to pay water fees to the Water Management Company. In addition, the Lao Government has a policy to transfer management (and ultimately ownership) of irrigation schemes from the government to the water user organization.

In general, the farmers on both the Lao and Thai side wish to be more involved in irrigation scheme operation and to have sufficient water and other agricultural inputs for their crop cultivation. However, the marketing issue (related to crop diversification) is also a decisive one. Without markets, farmers are not very enthusiastic to take over irrigation scheme operation from the public sector and very much like to receive subsidy from the government.

Conditions for Irrigation Management Transfer (IMT)

Because of the different economic developments in Laos and Thailand and the different attitudes of the governments, conditions for IMT are also different. The study of SIRAP Project showed the process of IMT in Laos as shown in Figure 7.

In order to implement IMT, three issues need to be clearly defined:

1. The government must have a clear policy of transfer of ownership of community schemes.
2. The water user organization must have a legal identity, such that they are in a position to accept the scheme and undertake all the necessary management activities required to run a scheme, i.e., have a legal charter, be registered within a legal framework, negotiate maintenance contracts, arrange loans with banks, have resources for arbitration when necessary, etc.
3. The water user organizations must develop their own rules and regulations for their own schemes, and have complete financial and operational control.

Findings from Regional Experience Exchange in IMT

One of the activities of the SIRAP Project in the IMT issue was the regional exchange program. Four visits and discussions in that field were organized between Thailand, Vietnam and Laos. These visits gave the chance to discuss and exchange ideas on the management of irrigation schemes and the participation of farmers.

In Vietnam, all schemes have to recover the cost of O&M, including some costs of the salaries of staff of the companies. The guidelines for setting of water charges are based on the type of scheme and cropping pattern. The water charges cover some budget for rehabilitation, routine maintenance, power consumed, administration cost and salaries.

In Vietnam, the organizational arrangements are more disciplined than in either Thailand or Laos and the farmers play a very active role in operation and maintenance, even in collecting water fees.

EXPECTED OUTCOME AND CONCLUSIONS

Discussions with government agencies concerned with the activities of the SIRAP Project during the last two years, and positive changes in policy aiming to involve farmers in irrigation management and agriculture development with the active support of the governments, showed that IMT can be applied to all small pump irrigation schemes.

For the medium schemes, the partial IMT can be applied in the secondary and tertiary canals.

In Thailand, the handing over can be done with O&M.

In Laos, the handing over can be done in two steps: the first is management transfer and the second is transfer of ownership. The selection of a pilot scheme as before applying to all the schemes of the project area is essential.

