

6.3 Special Sector Programs

6.3.1 Rationale

The three area development programs presented in the previous section will provide the driving force for the development of the entire LNE-UE regions. They emphasize explicitly the urban sector and industrial and related service activities. At the same time, they will induce the development of respective hinterland rural areas, and they will in turn be supported by enhanced productivity and living standards in the rural areas.

Three special sector programs are defined to complement and support the area development programs. Two of them will ensure the enhancement of productivity and living standards in rural areas of the entire LNE-UE. The third one will allow to diversify the regional economy by taking advantage of emerging opportunities for increasing economic interactions with the Indochina countries.

These sector programs are (1) Agricultural Diversification Program, (2) Rural Environment Enhancement Program, and (3) Broad Based Border Activities Promotion Program. These programs are described below with their objectives, component projects/programs, and implementing arrangements. Other regional and local projects/programs are also described at the end of this section.

6.3.2 Agricultural Diversification Program (ADIP)

(1) Background and objectives

Background

Crop diversification and livestock improvement are two most important strategy components to boost the agricultural production in the Study Area by changing its structure from traditional crops, subsistence-oriented one to commercial, market-oriented one. Crop diversification can be realized through both mixed farming by small farmers and large scale commercial operation. Contract farming is an effective measure to reconcile the small and the large with the organization of farmers. Also applied agricultural research should be geared more to establishing proper crop cycles.

Livestock improvement can also be realized by small farmers in their backyards and by large commercial enterprises. Among the important measures are the improvement of feed base, expansion of market outlets including processing, and a full range of extension services.

Active participation of farmers in all aspects of these structural changes is the basic requirement. In addition to contract farming, participatory approach is recommended. Individual farmers need to be motivated to cooperate with one another either on a project-wise basis or broadly through cooperatives.

A key to the success of these changes is how to coordinate and integrate various activities for better overall effects. Therefore, individual projects/programs proposed are packaged, and implementing arrangements for the packaged program are recommended.

Objectives

Objectives of this program are expressed as follows.

- 1) To increase farm incomes by increasing agricultural productivity, through crop diversification in favour of high value-added crops, and livestock improvement supported by coordinated services provision through integrated implementation of key projects/programs; and
 - 2) To encourage farmers' participation in changing the agricultural structure through cooperatives, contract farming and other schemes.
- (2) Development projects/programs

This program contains both production and support components. Some components are programs consisting of production and support elements. These component projects/programs are listed below. Their descriptions are found in subsection 4.1.3. The structure of this program is illustrated in Figure 6.4.

Projects	Production/Support
Mixed farming promotion	Production
Drip irrigation development	Production
Livestock improvement program	Production, Support
On-farm drainage improvement	Production, Support
Participatory irrigation system development	Production, Support
Agricultural marketing network development	Support
Agricultural cooperatives promotion	Support
Crop cycles research	Support

- (3) Implementing arrangements

Initial implementation

Production projects will be used as a core activity to implement this program. Local assembly markets will be established associated with the production projects, but once established will be used for other products as well. This new marketing outlet would provide farmers a motivation to enter into new production activities. Support measures will be provided by the respective production projects. Only a few local assembly markets may be established initially. At least one of them would better be established on a cooperative basis. In this case, support services would be channelled more effectively through the cooperative. A central commodity market will be established in one of the provincial capitals initially to serve the local assembly markets as well as other individual farmers. The concept of this initial implementation is illustrated in Figure 6.5.

Figure 6A Components of Agricultural Diversification Program

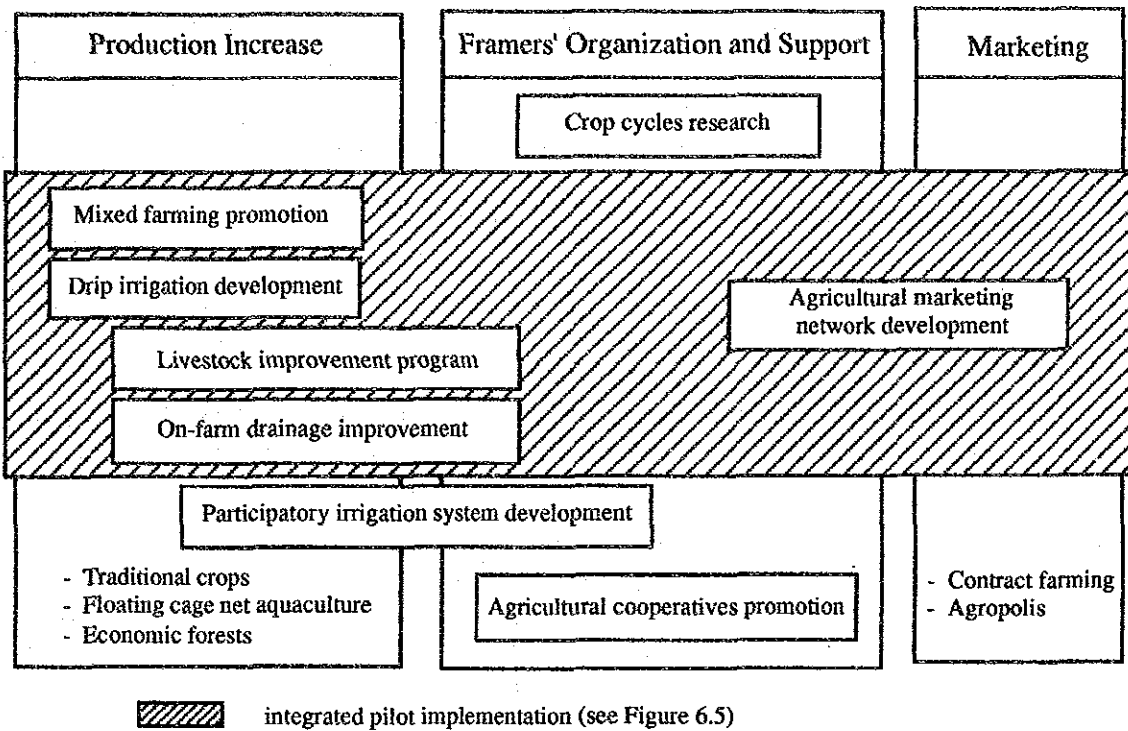
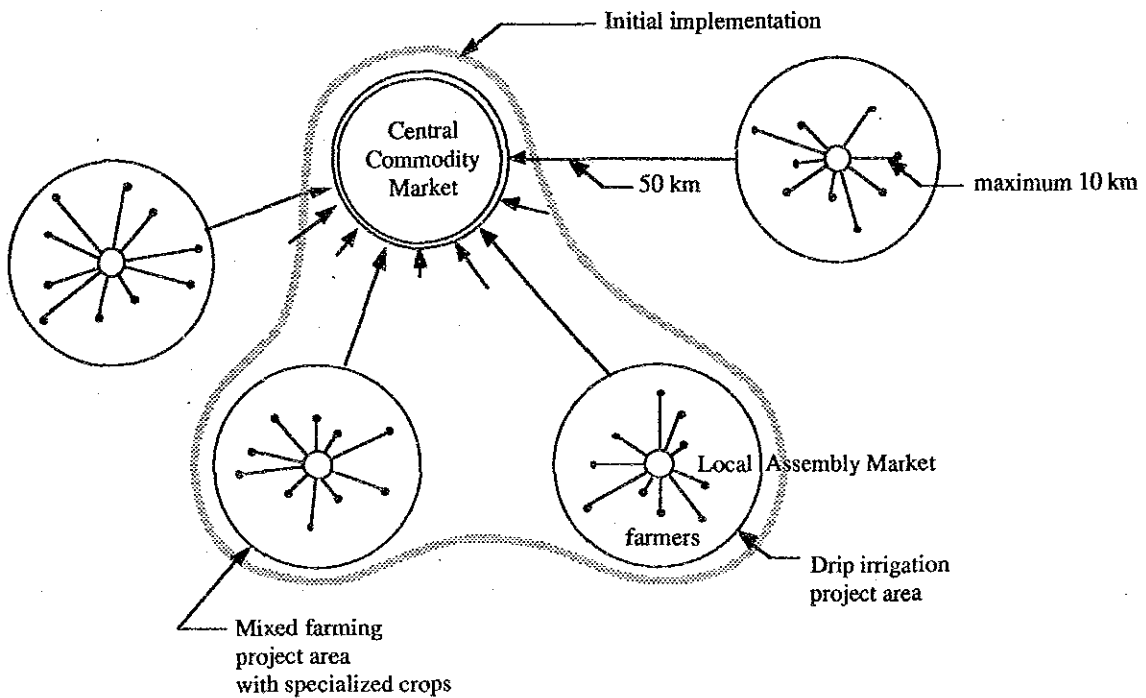


Figure 6.5 Concept of Agricultural Diversification Program Implementation



Expansion

The program will be expanded in steps to cover more local assembly markets. They will be established increasingly more on a cooperative basis capitalizing on the agricultural cooperatives promotion project. Results of the crop cycles research project will be put to field application under this program. Eventually, central commodity markets will be established in all the provincial capitals.

6.3.3 Rural Environment Enhancement Program (REEP)

(1) Background and objectives

Background

The Study Area is predominantly rural, and this symbolizes the least developed status of LNE-UE. Urbanization will proceed rapidly in the Study Area, but still over 50% of the people will be living in rural areas in the year 2010.

Enhancement of rural environment is critically important to uplift the living standards of the Study Area as a whole. First, the existing poverty will have to be alleviated with associated problems of acute water shortages, malnutrition, poor sanitation and inadequate social services. Second, economic activities in rural areas will have to be expanded and diversified to support the regional economy and to minimize the drift of people out of rural areas into large cities.

Improvements are necessary in many different aspects; improvement of one aspect would not take effects without concomitant improvements in other aspects. Various measures will have to be properly coordinated and phased. Therefore, a package of measures should be taken combining the projects/programs proposed by sector.

Objectives

Objectives of this program are defined as follows, corresponding to basic human needs (BHN) and needs for production increase.

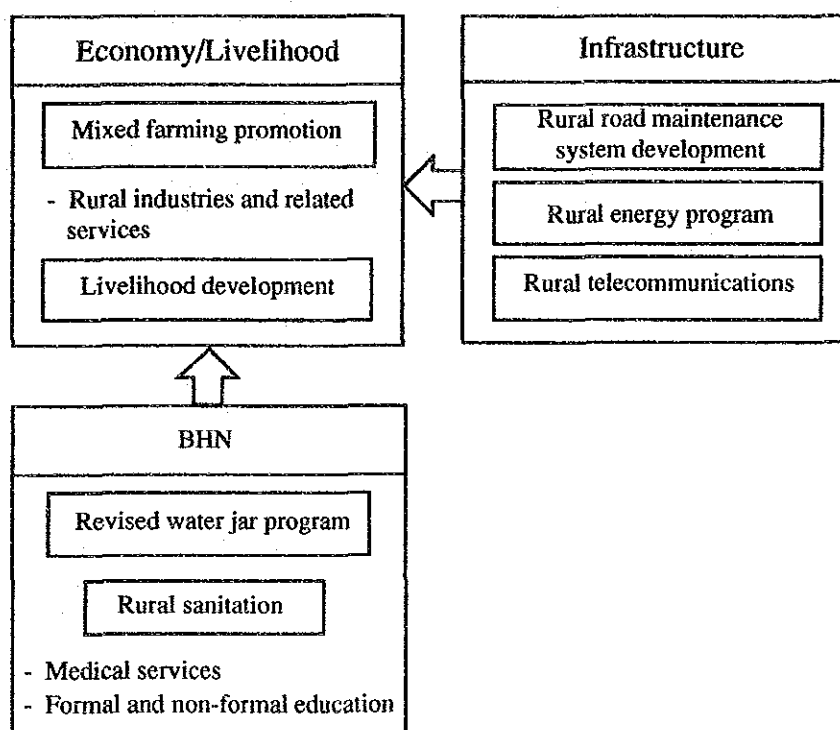
- 1) To alleviate poverty and associated problems in rural areas as the provision for basic human needs to improve moral sanitation of people and prepare a better base for market-oriented economic activities; and
- 2) To expand agricultural and related processing and service activities by improving the provision of infrastructure and other support services.

(2) Development projects/programs

This program consists of economic projects, infrastructure projects and BHN projects. Core projects/programs are listed below. The structure of the program is illustrated in Figure 6.6.

Project/Program		Subsection containing description
Economic projects :	Mixed farming promotion	4.1.3
	Livelihood development	-
Infrastructure projects :	Rural road maintenance system establishment	5.5.3
	Rural energy program	5.3.3
	Rural telecommunications	5.4.3
BHN projects :	Revised water jar program	5.2.3
	Rural sanitation program	-

Figure 6.6 Structure of Rural Environment Enhancement Program



(3) Implementing arrangements

Most of the component projects/programs may be implemented by respective line agencies. For coordinated implementation, however, the existing institution for rural development should be effectively utilized. In particular, the Tambon Rural Development Committees would be instrumental in working out implementation programs. Representatives of farmers in respective subject villages should be involved in program formulation.

Biomass and biogas components of the rural energy program should be integrated with the mixed farming promotion projects. Solar PV component may find application in the rural telecommunications project.

A community based rural road maintenance system should be established, and in some rural areas, linked to project areas of mixed farming promotion. This would

contribute to the marketing of new agricultural products by allowing more effective and timely repair services for rural access roads.

Mixed farming promotion in various forms will create opportunities for additional means of livelihood in services and simple processing. Support to these activities should be part of the program.

6.3.4 Broad Based Border Activities Promotion Program

(1) Background and objectives

Background

A major advantage of the Study Area is its location between the BMA/the ESB and the Indochina countries. Six of the nine LNE-UE provinces share borders with Cambodia and/or Laos. The link between the ESB and the Indochina will be improved with the establishment of the new regional artery passing through the central part of the Study Area.

How to make effective use of emerging opportunities for economic interactions with the Indochina countries is a key not only for the development of the Study Area but also for renewed growth of the Thai economy. The Study Area is in a pivotal position to take advantage of the opportunities.

The prospect for economic interactions with the Indochina goes well beyond just commodity trade. It extends to processing, tourism, financial transactions, technology development and skill training. The Study Area can lead the kingdom to assist the rebuilding of the Indochina countries by technical and financial cooperation through the private sector joint ventures and the official development assistance.

A package of measures should be taken to support a wide range of activities involving interactions with the Indochina. In particular, a new institution should be introduced to provide comprehensive supports to broad based border trade related activities.

Objectives

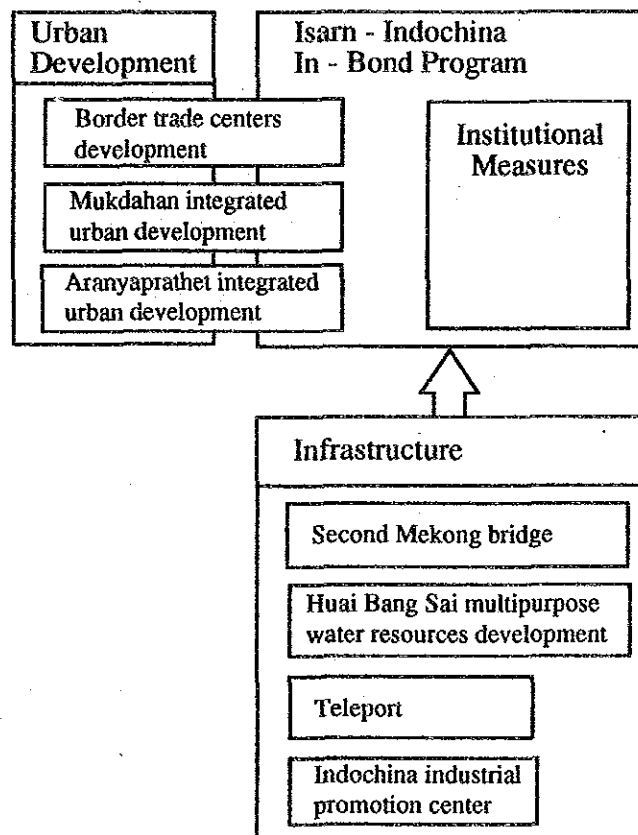
Objectives of this program are expressed as follows.

- 1) To encourage border trade and related production and services activities by introducing a new institution of support package; and
 - 2) To improve urban services to local communities through the improvement of urban infrastructure and utilities to support these border related activities.
- (2) Development projects/programs

The Isarn-Indochina In-Bond program proposed in the trade and distribution sector (subsection 4.4.3) is the center piece of this special sector program. It combines the institutional measures to support broad based border activities and the projects to improve urban infrastructure in selected urban centers. It will be supported by other infrastructure projects. Core projects/programs are listed below, and the structure of this program is illustrated in Figure 6.7.

Project/Program	Subsection Containing Description
Isarn - Indochina In-Bond (III - B) program	
Urban development projects	Border trade centers development 4.4.3
	Mukdahan integrated urban development 5.6.5
	Aranyaprathet integrated urban development 5.6.5
Infrastructure project :	Second Mekong bridge 5.5.3
	Huai Bang Sai multipurpose water resources development 5.2.3
	Teleport 5.4.3
	Indochina industrial promotion center 4.2.3

Figure 6.7 Structure of Broad Based Border Activities Promotion Program



(3) Implementing arrangements

Institutional mechanism should be developed in Phase I for the Isarn-Indochina In-Bond program, including legislative measures and custom services both in Thailand and in the Indochina countries. Plans for urban and infrastructure development should be prepared initially for selected urban centers and presented to the Laos and the Cambodian governments to convince them of the advantages of the scheme and to demonstrate Thai government commitment.

Prospective Thai investors shall be widely invited to participate in the program by clarifying special features and incentives to be provided. Initial establishments will be made by joint efforts of the government and private enterprises. The Indochina industrial promotion center to be established in Phase I will be expanded to support the program by meeting requirements for technology development and skill training. Border trade and distribution centers to be established within the Study Area will facilitate the marketing of products to the BMA, the ESB and export markets as well as other domestic markets.

6.3.5 Other regional and local projects

There are other projects formulated in different sectors, which are not included explicitly in any program described above but nevertheless are important on their own merits. They are categorized broadly in four sectors : environment, water resources, agro-related, and new energy. They are outlined below emphasizing their roles in LNE-UE regional development.

(1) Environmental projects/programs

The following projects/programs are included. They are described in subsection 5.1.3.

- Regional environmental monitoring
- Fragrant wood reforestation program
- Problem soil management and soil erosion prevention

Environmental management is critically important in the Study Area having generally vulnerable land and water environment. While urban-based environmental problems are addressed by individual control measures, a different approach is necessary to deal with rural-based problems. The problem soil management and soil erosion prevention project is particularly important to maintain the land productivity.

Reforestation areas for various economic forests have been broadly identified by a GIS. In addition to plantations of fast growing tree species already attempted, the fragrant wood reforestation program will examine the economic and social viability of the new possibility.

In addition to anticipating possible environmental problems and formulating measures to alleviate them, monitoring is essential. The regional environmental monitoring project will allow to identify problems at an early stage of development and take corrective measures to minimize adverse effects.

(2) Water resources projects

Water resources projects contained in the area development programs would assure adequate supply of water to fulfill designated functions of respective areas. The following projects will serve two other areas. They are described in subsection 5.2.3.

- Nakhon Nayok river basin multipurpose water resources development
- Yasothon water network development

Subsistence requirements for water in rural areas would be met largely by the revised water jar program contained in the Rural Environment Enhancement Program. To expand the water supply further, much increased use of groundwater is necessary.

The following should be implemented during Phase I (description in subsection 5.2.3).

- Groundwater exploration program

(3) Agro-related projects

Aquaculture should be promoted to improve nutritional conditions of local people and to let them earn extra cash income. The following projects, described in subsection 4.1.3, would be instrumental. In particular, the Yasothon aquaculture center would complement and strengthen the Ubon Ratchathani Agro-Industrial Forefront Development.

- Floating cage net aquaculture development
- Yasothon aquaculture center

Paddy cultivation and goat raising are not emphasized in the Master Plan. The following projects would safeguard future options.

- Rice products development
- Goat bank development

(4) New Energy Application Promotion (NEAP) Program

In addition to co-generation for Nakhon Ratchasima and the biomass, biogas and mini-hydro components of the rural energy program contained in the Rural Environment Enhancement Program, the following should be pursued under this program. They are described in subsection 5.3.3.

- Solar PV application
- Rick husk power generation
- Solar water heater application program

(5) Border trade centers

Border trade centers will be established at Aranyaprathet and Mukdahan as well as the one in Ubon Ratchathani contained in the area development program. A site should be selected for each center during Phase I, and initial facilities established in Phase II probably with permanent trade facilities, a branch at customs office, and financial facilities initially. Functions and facilities would be expanded in steps with a trade information center, grievance committee on trade disputes, exhibition, storage and sample processing facilities.

6.4 Human Development

6.4.1 Goal and objectives of human development

The term "human development" is used in this section instead of "human resource development". The idea is that it is human beings themselves who pursue development and receive benefits at the end. "Human resource development", on the contrary, implies that human is a tool for achieving development. Most recent discussions on education in Thailand tends to focus on human resource development for generating better quality laborforce regarding humans as one of the inputs for macro-economic development. In other words, conventional discussion tends to look

at the population as an agent playing a passive role in development process. Considering the ultimate goal of development, the achievement of a better life, the population should be regarded as generator and promoter of development, playing an active role in development process.

For realizing the concept of "humans as the main player and beneficiary of development", a new institutional set-up will be required that would ensure involving every party concerned in development process, from planning to implementation and monitoring. Under this set-up, the role of the government would be to assist and cooperate with the private sector and the general public in making efforts pursuing development.

Population in the Study Area, like any other region, is composed of various groups such as farmers, business management, industrial and service workers, government officers and others. A variety of problems faced in the Study Area affect activities and welfare of the Study Area's population in different ways. Consequently, measures to tackle these problems are varying, sometimes conflicting each other, while some are for the common interest of all parties concerned.

To ensure that the new development process functions effectively under these complex circumstances, "human development" plays an important role. The general population as well as government and business people would develop themselves so that decision making can be achieved based on sound skills and a broad comprehension of various issues.

With this understanding, the objectives of human development are specified as follows.

- 1) To expand educational opportunities for upgrading analytical and judgement capabilities of the population;
- 2) To reinforce the higher education and research and development programs to promote social and technological innovations conducive to development;
- 3) To provide the population with opportunities to upgrade professional skills that would enable the improvement of income level in rapidly changing society; and
- 4) To improve public health condition of the population as the basis for active engagement in development activities.

In the following subsections, the strategy and measures to achieve these objectives are presented.

6.4.2 Education and skill development

Overall strategy in education and skill development has the following components.

- (a) Government efforts in education and skill development should focus on skill development of the existing labor force as the most immediate and short-term strategy to upgrade income levels of the population. The expansion of basic education should be regarded within a more medium to long-term perspective as it will take some years before its effects begin to be felt.

Government efforts in expanding skill development programs and basic education programs should be promoted in parallel, but with this difference in time frame kept in mind.

- (b) To cope with mounting requirements for educational and skill training programs, existing resources should be flexibly utilized beyond administrative boundaries. Cooperation in resource diversion and sharing of resources should be promoted, for example, between primary schools and secondary schools and between vocational colleges and skill development institutes.
- (c) The objective of expanded educational and skill training programs should basically be to open ways for upgraded skill levels needed for the development of the Study Area. The role of the provincial government should be strengthened as an effort to tailor various education and skill training programs to meet local needs.
- (d) The role of private sector as provider of educational opportunities should be more emphasized. Under a more flexible system, private schools could provide quality education to selected groups, while government concentration on providing baseline education. A government-private joint skill training program such as Choonhavan Technology Center in Nakhon Ratchasima is also a possibility to be pursued.
- (e) Role of education in minimizing various social problems associated with economic development should be recognized and relevant educational programs be integrated into curricula.

Individual objectives and strategy for each education level are presented below for basic education (primary to upper secondary school), higher education (university/college and upper), and non-formal education and skill training.

Basic education

The objective of reinforcing the basic education system is to provide wider opportunities to the population to acquire sound analytical and judgement capabilities. With better capabilities, the population will be able to bear a more important role and perform it more effectively in development process as one of the important players of development. At this stage of the educational system, emphasis is to be placed on :

- basic reading, writing, speaking and listening abilities,
- communication ability,
- knowledge on various subjects, and
- training of analytical skill.

The strategy for basic education are as follows:

- (a) To expand lower and upper secondary schools in rural areas, especially in remote areas by diverting primary educational resources to secondary education;

- (b) To strengthen financial assistance programs to support poor families to send their children to primary and secondary schools. This measure together with the measure (a) above would be instrumental in raising enrollment rate at secondary school level;
- (c) To allow a higher level of flexibility in curriculum preparation so as to meet various needs specific to each area;
- (d) To enhance the role of the private sector in providing basic education through relaxing controls and regulations (e.g. regulation on maximum chargeable tuition fee);
- (e) To restore the social status of teachers and upgrade their teaching capability; and
- (f) To expand non-conventional educational programs such as the distance educational programs through application of modern telecommunications and audio-visual media, especially for remote areas (c.f. The "Teleport" project proposed by the Study could provide a good hardware for this approach.) and mobile teaching programs.

Higher education

The role of higher education would be to provide opportunities for some upper secondary school graduates to pursue further professional education in humanities, social and natural sciences. Graduates from the higher educational programs are expected to bear an important role in leading technological developments and social reforms. The Suranaree University of Technology in Nakhon Ratchasima is a recent challenge of the Thai government to establish a new higher educational center in the Study Area focusing on science and technology fields and with a new administrative principle giving higher level of autonomy to the university. The challenges and experiences of the Suranaree University of Technology should be duly considered and reflected in the planning and implementation of higher education projects in the Study Area in the coming years. Ubon Ratchathani University will send its first graduates to the society in social sciences in 1993.

The strategy for higher education in the Study Area are summarized as follows.

- (a) To establish another major higher educational institute in the Study Area by the year 2001 (the medium target year) that would cover both science and technology and social science fields to meet growing demand for skilled personnel in these fields in addition to the existing two universities.
- (b) To convert Ubon Ratchathani University to an open university, capitalizing on Teleport Project in Ubon Ratchathani. This will ensure a much easier access to higher education for the regional population.
- (c) To capitalize on the existing higher education institutes in the Study Area such as teacher colleges and agriculture colleges and develop them to higher level education institutes covering a wider range of specialities and to increase the enrollment to meet the expected growth for skilled workers.

- (d) To allow a higher degree of autonomy for new public higher education institutes to be able to meet the conditions necessary for successful operation such as follows:
- to recruit good faculty with financial conditions competitive with the private sector,
 - to prepare curricula suited to various requirements arising from the Study Area's development, and
 - to set tuition fee level affordable for the students.

Rather than depending on increased subsidy from the central government, these institutes are expected to rely more on their own operational efforts in securing additional income sources such as joint scholarship program with the private sector and self-income generating activities with a higher degree of autonomy.

- (e) To encourage the private sector to invest into the establishment of higher education institutes through relaxing a number of controls and regulations such as tuition and fee control and curriculum regulation on private education; application of incentive measures such as those offered by BOI to industries would be a measure that could turn the Study Area into an attractive location for higher education investment.
- (f) Course offerings should be tailored to prospective demands arising from expanded and diversifying economic activities in the Study Area. Educational programs should also be enlivened through various measures.
- (g) The "ability-to-pay" principle should be introduced to tuition fee system, while scholarship programs should be expanded in parallel.

Non-formal education and job training

Development in the basic education and higher education aims at providing opportunities for formal education to young people. Non-formal education and job-training are, on the contrary, designed to cater for adults who either lack or have already finished the formal education programs and are already active in the society. The objectives of non-formal education and job-training are the following:

- (a) to provide adults who lack formal education or are eager to learn more with opportunities for learning basic skills (e.g. reading and writing skills) and developing analytical and judgement skills (non-formal education), and
- (b) to provide the population with opportunities for learning and training professional skills applicable to their works (both non-formal education and job-training).

Non-formal education for basic skills should contribute to upgrading the level of intelligence and analytical capability of the population, thereby enabling them to bear a greater role in development process. Job training, if reinforced appropriately, would provide the population with good chances of getting better jobs in changing circumstances of the Study Area resulting in improved income level. Better income

ensures a wider choice of even better jobs as well as provide a firmer foothold for participation in social and economic development.

The strategy for non-formal education and skill-training programs are summarized as follows.

- (a) To expand non-formal education programs targeting at both urban and rural population through establishing non-formal education centers, introducing mobile teaching unit and applying modern technology and audio-visual media as well as capitalizing on indigenous teaching practices (e.g. teaching at temples).
- (b) To encourage and support farmers in setting up various opportunities for exchange of opinions and information on agriculture development in parallel with upgrading the existing agriculture extension services rather than expanding them.
- (c) To allow a higher level of flexibility in curriculum preparation to tertiary level vocational schools and other job-training centers so that curricula matched to the local needs can be developed and offered.
- (d) To review the role of private job-training programs and provide support measures such as tax incentives and financial support.
- (e) To develop a "distant-learning system" in connection with the "Teleport" development concept planned in Ubon Ratchathani.
- (f) To support activities of non-governmental organizations (NGOs) active in developing managerial skill of the rural population.
- (g) A system should be established to ensure smoother exchanges of information on manpower requirement and availability involving the supply side (schools and skill training institutes) and the demand side (private firms, public organizations etc.).

6.4.3 Improvement of public health condition

Health is the basis for any kind of human activities : personal life, family life, economic activities and social activities. Good health opens the way for pursuing a better life and provides the basis for social engagement. Improvement in health condition, therefore, is one of the most important tasks to fulfill basic human needs.

Public health condition in the Study Area is characterized by a high level of morbidity, malnutrition and infant mortality and poor health services level compared with other regions in Thailand. Poor public health condition in the Study Area is attributed, most fundamentally, to poverty as well as to under-investment in health service facilities and underutilization of the existing facilities due to various constraints on the part of the local population. It is certain that an increase in the income level will lead to the improvement of health condition because of better nutrition and better chances for using the existing medical facilities. This direction should be pursued in the context of promoting economic development and poverty alleviation. There are also a number of measures specific to the public health sector that would contribute to improving the public health conditions under the existing

economic condition. The major strategy for the public health sector are summarized as follows.

- (a) To strengthen and upgrade the functions of tambon health care centers.

The functions of tambon health care centers as the local medical center should be reinforced to be able to offer primary health care to a wider segment of rural population. They should have sufficient manpower and equipment so as to cover all communities under their jurisdictions in providing various medical and health services such as a routine health check-up, immunization services, more sophisticated treatment of injuries and diseases currently transferred to amphoe medical centers, provision of educational programs and dispatch of mobile medical unit.

- (b) To develop and promote educational and awareness programs.

With tambon health care centers as the core of activities, educational and awareness programs should be prepared and presented to local population more widely. The idea is that there are many simple measures in daily life that could prevent diseases and improve health condition (e.g. appropriate management in water use, information on diseases, nutrition management, and hygiene management).

- (c) To encourage close collaboration between tambon health care centers and local communities.

Any type of medical services provided by the public sector is most effective when a strong leadership and cooperative organization exist on the side of local community. Such programs as mentioned above in (a) and (b) should be promoted under a cooperative mechanism with local communities. Whenever necessary, financial support to the community should be considered for such a collaborative work and voluntary activities by the community.

- (d) To effectively integrate public health improvement component into various infrastructure development projects.

Certain types of infrastructure development contribute to improving public health condition of the local population such as improvement of access to hospitals by upgraded road, supply of clean water and transmission of medical information by improved telecommunications network. It is, therefore, recommended that such impacts on public health aspect be duly considered in planning various infrastructure projects.

- (e) To accord priority to least advanced areas in terms of investment on medical service resources.

From the viewpoint of inter-provincial balance, priority in investment on medical resources expansion should be placed on least advanced provinces such as Si Sa Ket and Surin where various indicators show an especially low level of medical service resources in the Study Area.

- (f) To develop and expand a medical insurance system to the rural population.

As a measure to reduce financial constraint in using medical services, a medical insurance system should be expanded to cover not only the employed people, who are at present accessible to the existing insurance system, but also self-employed people such as farmers and small scale enterprises. Development of the existing "community-based health card project" into such an insurance system would be a viable alternative.

- (g) To review advantages of traditional and indigenous medical techniques and effectively integrate them with the modern medical techniques.

A review should be made on effectiveness of traditional and indigenous medical techniques such as herbal medicines and traditional nutrient management. The findings could be effectively incorporated into various programs to be provided by tambon health care centers in close cooperation with local communities.

6.4.4 Projects proposed for human development

A number of projects and programs were identified to pursue human development in the Study Area. A brief description is given below.

Education and skill development

A number of possible skill development projects were identified based on the analysis on existing condition and potential for regional development in the Study Area, especially in relation with potential and anticipated roles of each sub-region within the LNE-UE regions. It is assumed that expansion of basic education programs be planned within the national educational development context rather than within the LNE-UE regional development context. The following projects were identified.

- (a) Thai-Khmer Culture Bridge Project (Sector Report 11. "Socio-economy and Social services)

Training of Khmer-origin minority population for tourist guide and trade/business firm personnel

- (b) Thai-Vietnam Culture Bridge Project (Sector Report 11. "Socio-economy and Social services)

Training of Vietnamese-origin minority population for tourist guide and trade/business firm personnel

- (c) Si Sa Ket Agriculture Training Center (Sector Report 1. "Agriculture")

Provision of a multi-facet and multi-directional opportunity for information exchange on agriculture development among government officers, farmers, researchers, NGOs, and school teachers and students.

- (d) Korat Skill Training Center (Sector Report 2. "Industry")

An existing program implemented by the Department of Skill Development

- (e) Yasothon Aquaculture Training Center (Sector Report 1. "Agriculture")

An extension and development of the ongoing UN project called "Communities Fisheries Management in Rural Reservoirs"

- (f) Thai-Cambodia Skill Development Center (Sector Report 2. "Industry")

A skill training center centering on industrial technologies for Upper East Region population as well as Cambodian population.

Public health

A project proposed from the viewpoint of reinforcing primary health care services is the "Tambon Health Care Center Expansion Program". The program will aim at upgrading public health condition of overall rural population by reinforcing the capacity of existing tambon health care centers. The expanded health care centers will provide primary health care services for rural population more widely and closely.

Under this program, all the tambon health care centers within the Study Area will be manned with at least five health care workers and provided with a vehicle and audio-visual equipment for disseminating health education programs. Establishment of a second health care center for all tambons would be implemented basically beyond 2001.

Integrated programs

The "Rural Environment Enhancement Program (REEP)", one of the special sector programs described in sub-section 6.3.3 and the "Integrated Urban Development (IUD)" proposed for urban system in sub-section 5.6.3 will also contribute to preventing or improving public health problems in the Study Area.

REEP is an approach that tries to upgrade the rural people's quality of life by tackling economic and basic human needs (BHN) problems including public health problem in a coherent manner. REEP should be designed such that initial support by the government through REEP would be a trigger for rural people to escape a vicious cycle of "poverty - low quality of life - poverty" to capture a favorable cycle of "better income - more favorable living environment - better income". Self-reliant development by rural people will become possible once this process takes place.

IUD aims at creating a comfortable living condition for urban population in the major cities by guiding various urban developments in an environmentally acceptable manner according to an overall land use plan as well as developing various infrastructure facilities needed to maintain sanitary living condition such as water supply, wastewater treatment and solid waste disposal. This approach could be referred to as "offensive" in that necessary measures will be taken well in advance to avoid or minimize any problems as opposed to a "defensive" approach that implies taking curative measures after all environmental and health problems become too serious.

6.5 Implementing Arrangements

6.5.1 Management of investment schedule

(1) Projected public fund allocation to LNE-UE

The availability of public fund to be allocated to the programs/projects in the LNE-UE regions has been estimated by the ratio of all public investment to GDP, investment shares by the LNE-UE regions (nine provinces), and expected GDP growth. The average ratio of all public investment to GDP during 1985-1991 was calculated at 6.2%. Public investment shared by the LNE-UE regions was 11.7% on the average during 1989-91. GDP is expected to grow on an average at 8.2% per annum in real terms during 1992-1996 (7th Development Plan) and 6.5% per annum during 1996-2010.

The term of "public fund" is defined as public investment consisting of government investment (through ministries/departments) and fifty non-financial state enterprises investment. Since annual fund mobilization was estimated based on the government investment and state enterprises investment data, capital outlays of local governments and private firms are not included in the estimate of fund mobilization. Fund mobilization was estimated on the expenditure basis, implicitly reflecting implementation ability of the government agencies.

The cumulative amount of public fund allocation to LNE-UE is projected to be 85.2 billion baht during 1993-96, 144.8 billion baht during 1997-2001 and 408.7 billion baht during 2002-10. The total amounts of fund that may be mobilized in the LNE-UE regions up to 2010 was estimated to be 638.7 billion baht.

(2) Indicative investment schedule

An indicative investment schedule for all the projects in the LNE-UE regions is shown in Table 6.5 for Phase I and Phase II. The schedule shows a broad breakdown of the projected total public investment fund by sector. The breakdown reflects public investment allocation to sector agencies at the national level in the recent years, regional characteristics, and master plan emphasis.

For the core projects of the LNE-UE regions, a crude estimate has been made individually for each project. For those core projects for which studies will be carried out first in Phase I, investment costs are not shown explicitly except indicative allocation for studies. Costs of implementation depend on study outcomes and may be included in costs for "other projects" in respective sectors.

(3) Investment requirements for core projects

Early implementation of core projects is essential for the realization of LNE-UE regional development in accordance with the Master Plan. The total investment requirements for the core projects are 19,950 million bahts during Phase I and 60,950 million bahts during Phase II, corresponding to 23 and 42% of the projected total public investment allocation to LNE-UE in the respective phases (Table 6.6). The total investment costs for the core projects during Phase II will depend on projects to be formulated through studies in Phase I, but may require a slightly larger share of the projected public fund availability.

Table 6.5 Indicative Investment Schedule for LNE-UE Regional Development (1/2)

(Unit : million baht)

Sector/Projects	Agency	Status	Phase I (-1996)	Phase II (1997-2001)	Phase III (2002-2010)	Total	(%)
1. Agriculture and Water Resources			21,296	36,194	102,178	159,667	25
1.1 Agricultural Diversification Program (ADIP)	Inter-agency	New	800	2,500			
1.2 Drip Irrigation Development & Drainage	RID, etc.	"	2,300	10,500			
1.3 Small Pumping Reservoirs Development	Inter-agency	"	2,700	6,500			
1.4 Lam Don Yai / Huai Tha Multipurpose	"	"	100	*			
1.5 Lam Nam Chi / Lam Plai Mat Multipurpose	"	"	100	*			
1.6 Huai Bang Sai Multipurpose	"	"	50	*			
1.7 Nakhon Nayok/Prachin Buri Multipurpose	"	"	50	*			
1.8 Yathoton Water Network	"	"	100	*			
1.9 Revised Water Jar	"	"	*	*			
1.10 Groundwater Exploration	"	Extension	*	*			
1.11 Phanom Dong Rek Water Resources Dev.	RID	On-going	1,400	700			
1.12 Others			13,696	15,994			
- Implementation of 1.4, 1.5, 1.6, 1.7, 1.8 & 1.9							
2. Energy			14,481	24,612	69,481	108,573	17
2.1 Lam Takong Pumped Hydropower	EGAT	On-going	5,300	12,000			
2.2 Pak Mun Hydropower	"	"	*	*			
2.3 Natural Gas Pipeline Extension	PTT	Planned	*				
2.4 Co-generation System	EGAT	"	100	*			
2.5 Others			9,081	12,612			
- Power Transmission & Distribution	EGAT	Extension	*	*			
- Rural Energy Program	Inter-agency	New	*	*			
- Joint Hydropower Development with Laos	"	Planned		*			
3. Transportation and Communications			21,296	36,194	102,178	159,667	25
3.1 Regional Artery Establishment	DOH	New	1,700	6,900			
3.2 Railway Improvement	SRT	Extension	100	2,200			
3.3 Route No.24 Improvement	DOH	"	500	2,200			
3.4 Second Mekong Bridge	MOTC	Planned	100	700			
3.5 Buri Ram International Airport	AAT	New	100	400			
3.6 Local Air Services Network	"	"	100	100			
3.7 Provincial Roads and Highways	MOTC	Extension	*	5,035			
3.8 Other Transport Projects			18,696	18,659			
- Ubon Ratchathani Airport	AAT	Extension					
- Mukdahan Local Airport	"	New					
- Nakhon Ratchasima Airport	"	Planned					
- Regional Truck Terminals	MOTC	New	50	50			
- Rural Road Maintenance System	"	"	*	*			
- Inland Waterways, etc.	"	"					
3.11 TOT Rural Long Distance Telephones	TOT	Extension	5,000	10,000			
- Rural Telecommunications		New					
- Others							
3.12 Teleport	MOTC	New	200	800			
3.13 Other Communication Projects	"		4,800	9,200			

Table 6.5 Indicative Investment Schedule for LNE-UE Regional Development (2/2)

(Unit : million baht)

Sector/Projects	Agency	Status	Phase I (-1996)	Phase II (1997-2001)	Phase III (2002-2010)	Total	(%)
4. Urban Development			7,666	13,030	36,784	57,480	9
4.1 Nakhon Ratchasima Integrated Urban Dev.	Inter-agency	New	800	1,800			
4.2 Ubon Ratchathani Integrated Urban Dev.	"	"	400	2,000			
4.3 Mukdahan Integrated Urban Dev.	"	"	200	1,000			
4.4 Aranyaprathet Integrated Urban Dev.	"	Extension	200	1,000			
4.5 Buri Ram / Surin Twin City Development	"	"	200	1,600			
4.6 Others	"		5,866	5,630			
- Secondary Town Development		Extension					
- Rural Centers Development		"					
5. Environment							
5.1 Northeast Industry Promotion Sub-Center	MOID	New	50	250			
5.2 Khao Yai Resort and Research Development	TAT & MOE	"	100	1,400			
5.3 Agropolis	Inter-agency	"	50	150			
5.4 Nakhon Ratchasima Industrial Modernization	MOID	"	50	100			
5.5 Others			2,305	2,443			
6. Education			5,963	10,134	28,610	44,707	7
6.1 Si Sa Ket Agriculture Training Center	MOIT	New	30	*			
6.2 Korat Skill Training Center	MOAC	On-going	540	*			
6.3 Thai-Vietnam Culture Bridge Project	"	New	20	*			
6.4 Yasothon Aquaculture Center	"	"	19	*			
6.5 Thai-Khmer Culture Bridge Project	TAT	"	*	20			
6.6 Thai-Cambodia Skill Development Center	MOID	"	*	120			
6.7 Others			5,354	9,994			
- Buri Ram Provincial Training Center	MOIT	New					
7. Public Health			4,259	7,239	20,436	31,933	5
7.1 Tambon Health Care Center Expansion	MOPH	New	1,344	1,680			
7.2 Others (conventional programs)	"	Extension	2,915	5,559			
- Village Health Care Center Dev. Program							
8. Social Development			7,666	13,030	36,784	57,480	9
8.1 Rural Environmental Enhancement Program [REEP]	MOIT	New	2,000	5,000			
8.2 Others			5,666	8,030			
Public Fund Availability (Total)			85,183	144,774	408,710	638,667	100

* Costs to be incurred but not estimated; some costs included in other projects.

Table 6.6 Indicative Public Investment Allocations to Core Projects (1/2)

Programs/ Projects	Phase I (- 1996)	Phase II (1997-2001)
<u>Regional/Inter-regional Projects</u>		
Regional artery establishment	1,700	6,900
Railway improvement	100	2,200
Route No.24 improvement	500	2,200
Second Mekong bridge	100	700
Local air services network development	100	100
Small pumping reservoirs development	2,700	6,500
Phanom Dang Rek water resources development	1,400	700
Lam Thakong pumped storage power generation	5,300	12,000
Pak Mun hydropower	*	*
Sub-total	<u>11,900</u>	<u>31,300</u>
<u>Area Development Programs</u>		
1. Greater Nakhon Ratchasima Industrial Center		
1.1 Nakhon Ratchasima integrated urban dev.	800	1,800
1.2 Nakhon Ratchasima industrial modernization	50	100
1.3 Natural gas pipeline extension	*	-
1.4 Co-generation system	100	*
1.5 Khao Yai resort and research development	100	1,400
	<u>1,050</u>	<u>3,300</u>
2. Ubon Ratchathani Agro-industrial Forefront		
2.1 Ubon Ratchathani integrated urban dev.	400	2,000
2.2 "Teleport"	200	1,800
2.3 "Agropolis"	50	150
2.4 Border trade center	50	-
2.5 Lam Don Yai / Huai Tha multipurpose	100	*
	<u>800</u>	<u>3,950</u>
3. Buri Ram - Surin Integrated Central Area		
3.1 Buri Ram international airport	100	400
3.2 Northeast industrial promotion sub-center	50	250
3.3 Lam Nam Chi / Lam Plai Mat multipurpose	100	*
3.4 Buri Ram - Surin twin city development	200	1,600
	<u>450</u>	<u>2,250</u>
Sub-total	<u>2,300</u>	<u>9,500</u>

Table 6.6 Indicative Public Investment Allocations to Core Projects (2/2)

Programs/ Projects	Phase I (- 1996)	Phase II (1997-2001)
Special Sector Programs		
1. Agricultural diversification (ADIP)		
1.1 Drip irrigation development	2,300	10,500
1.2 Other components	800	2,500
	<u>3,100</u>	<u>13,000</u>
2. Rural environment enhancement (REEP)		
2.1 Total allocation	<u>2,000</u>	<u>5,000</u>
3. Broad based border activities promotion (Allocation included in other projects)	*	*
Sub-total	5,100	18,000
Other Local Projects		
Mukdahan IUD / border trade center	200	1,000
Aranyaprathet IUD / border trade center	200	1,000
Yasothon water network development	100	*
Yasothon aquaculture center	50	150
Huai Bang Sai multipurpose development	50	*
Nakhon Nayok/Prachin Buri multipurpose dev.	50	*
Groundwater exploration	*	*
Sub-total	<u>650</u>	<u>2,150</u>
Total	<u>19,950</u> [23%]	<u>60,950</u> [42%]

* Costs to be incurred but not estimated; some costs included in other projects.

It is unlikely for Phase I that the core projects proposed by the Master Plan would have an "crowding out" effect on other regular projects. Public investments during Phase II will be dominated by the core projects, including those to be formulated through studies in Phase I. The core projects can be implemented during Phase I and Phase II without distorting the overall public investment fund allocation at the national level to transform the development structure of the LNE-UE regions.

(4) Planning and budgeting linkage

The LNE-UE projects are characterized by two aspects. One is regional development, and the other is long-term development. In order to implement the planned schedule of all the projects in the LNE-UE regions, these two aspects will have to be fully taken into account to strengthen the linkage between planning and budgeting in the existing budgetary preparation system.

Investment programs of various line agencies do not seem to be always well coordinated. Each program is assessed on its own merit without being examined under any macro perspective. It also happens that a budget which does not support the development plan is proposed on the regional basis. At the time of budget preparation, an emphasis shall be given to the linkage between planning and budgeting.

It is therefore suggested that investment planning be undertaken in the annual budget preparation through three major steps as follows.

- 1) Each government agency and state enterprise should firstly submit proposed development projects during the plan period by way of annual budget submission, making development projects an integral part of the budgetary process.
- 2) The government agencies responsible for the nation's fiscal budgeting (viz., the Bureau of the Budget, Ministry of Finance, Bank of Thailand, NESDB, etc.) should check/determine the level of potential revenue available for the plan period, the size of public debt to be incurred, and thus the size of potential resource availabilities, in the light of expected economic situations to be prevailing over the period.
- 3) In collaboration with NESDB, the Bureau of the Budget then will determine the size of development expenditure and the budget to be appropriated for each development project submitted by government and public agencies concerned.

By this process, investment planning could be efficiently carried out through coordination of public development projects and within the inter-regional and/or inter-provincial framework. In this connection, problems in planning and monitoring of public fund flow might deserve the most urgent attention since they have a great bearing on resources allocation and their efficient use.

As pointed out in numerous study reports and strategic guidelines, the sole key to improvement for efficient use of allocated resources lies in human development. To enhance the efforts toward the efficiency improvement and promote properly the proposed programs/projects in the LNE-UE regions, it is essential to establish a systematic and coordinated personnel training system. Lack of such system or weak

back supporting will be clearly a major hindrance to future development of the LNE-UE project management.

6.5.2 Development administration for regional development

(1) Project management system

The Thai government has an established management system for rural (or regional) development. Using its information system, the government is actively implementing the "Rural Development Program" to alleviate poverty and associated problems in rural areas. This system seems practical provided that key administrative reforms presently contemplated by the government are enacted. Basic directions of such reforms are further decentralization of development administration and strengthening of rural development institutions to assume regional roles.

Development administration proposed here is based on the existing management system and the envisioned reforms. A key to the envisioned reforms is to increase and strengthen administrative and financial capacities of local administrations: muang and tambon municipalities, sanitary district administrations (SDA's), and changwat administrative organizations (CAO's). To realize this effectively, a new institution called a Project Management Unit (PMU) may be established. For the LNE-UE regions, PMU may be based on the two regional offices of NESDB for initial staffing and budgeting. The development administration with PMU is described below for national, regional/provincial and local levels (Figure 6.8)

(2) National level

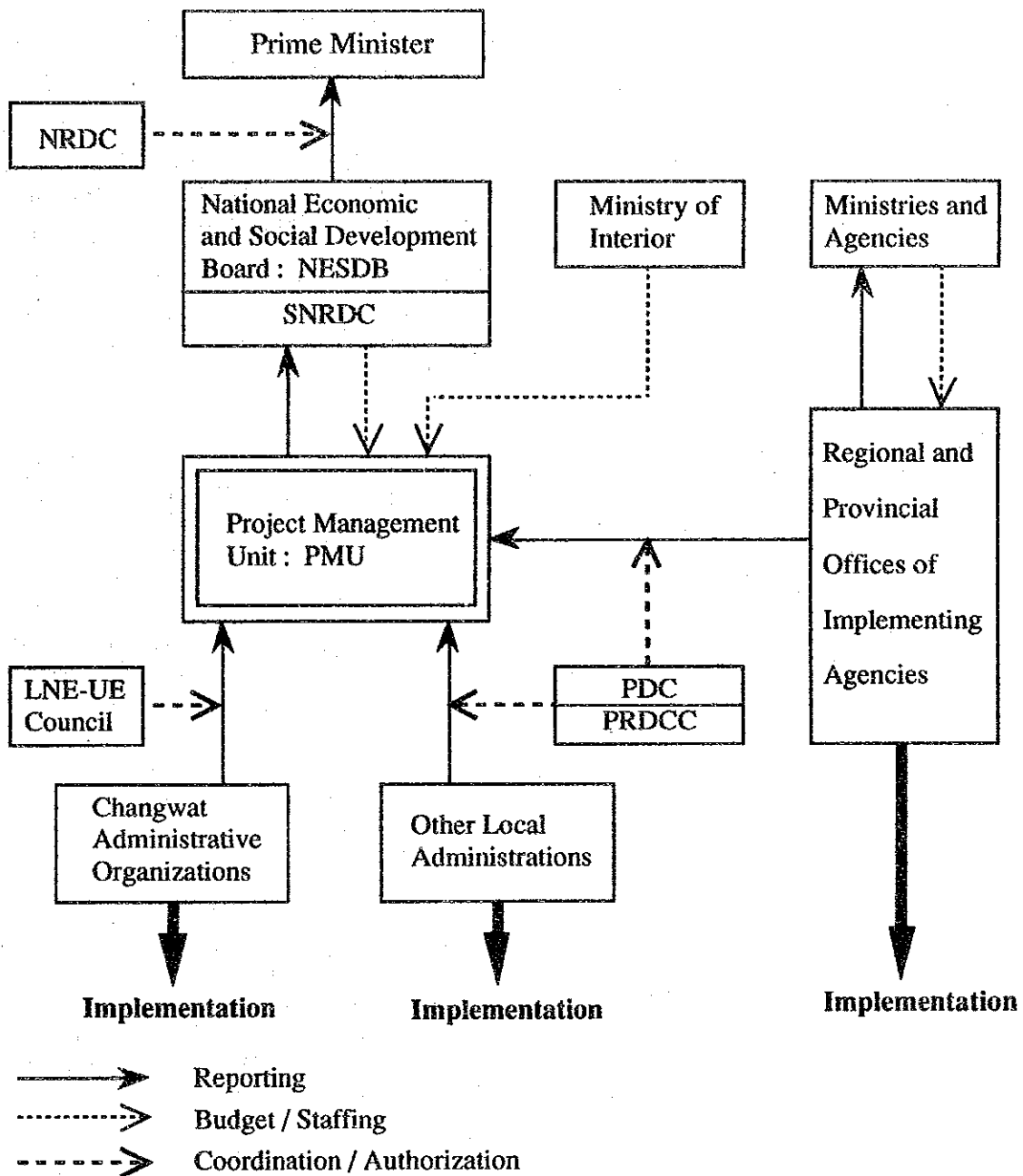
The development management at the national level by the National Rural Development Committee (NRDC) will not basically change, except it would better be renamed the National Regional Development Committee. NRDC assumes roles of policy formulation, coordination among central agencies, review of annual and multi-year programs, supervision of their implementation at the central level, and promotion of institutional and financial capacities in regions, all related to regional development.

As a working office, the Office of the Secretary to the National Regional Development Committee (SNRDC) is responsible for the coordination of the overall regional development management activities and for the review, recommendation and advisory matters for NRDC. Major tasks of SNRDC are to coordinate the development programs/projects, their screening, coordination, monitoring and evaluation, and submit them for final approval by NRDC. The inter-regional and inter-provincial programs/projects will be coordinated at the NRDC/SNRDC level.

(3) Regional/provincial level

At the provincial level, the existing Provincial Development Committee (PDC) and the Provincial Rural Development Coordination Center (PRDCC) should be strengthened, with the support of PMU. The LNE-UE council may be established to coordinate these provincial institutions, consisting of governors of LNE-UE provinces and a representative of the office of the Prime Minister, chaired by the PMU director.

Figure 6.8 Project Management System for LNE-UE Regional Development



Main functions of PMU to be effected through PDC and PRDCC are the following:

- 1) to review and update the Master Plan occasionally,
- 2) to review the programs of line agencies, and coordinate and integrate them for submission to NRDC,
- 3) to identify fund sources for implementation of the programs,
- 4) to prepare/initiate integrated area development and multi-sector programs, and
- 5) to promote investment opportunities to Thai and foreign investors.

(4) Local level

At the local government level, the line rural (or regional) development committees established in each district, tambon and village undertake the monitoring and evaluation of the programs/projects, and submit revised proposals for the annual and multi-year programs/projects to PDC/PRDCC.

To improve and strengthen the capabilities of the existing rural (or regional) development management system, it is recommended to start an "institutional supporting program". The program comprises the following major components.

- 1) To assist the PDC/PRDCC activities in each province and ensure the smooth implementation of the development programs/projects, this program will dispatch from the central office an experienced development expert to each development office and committee for a period of five years.
- 2) A principal ministry (e.g. Ministry of Interior) and agency concerned will assign/dispatch the experts in planning, implementing and managing the regional development programs/projects to the respective provincial and local government offices. They will undertake the counterpart training.
- 3) This program will assist this decentralized management system for 10 years mainly by means of providing the salary of experts and certain local staff and necessary equipment like personal computers.
- 4) To deal with a large volume of data and information, it is necessary to standardize the document formats as simple as possible, while the equipment and instruments for filing/keeping system will be provided with appropriate instructions and procedures.
- 5) While the regional (or rural) development management is a joint responsibility of the central and local governments, especially at the initial stage, its effectiveness and success will depend largely on their skills and resources and the involvement of private organizations and general public in the areas. To realize the expected results, it is vital to provide training seminars and workshops with a view to disseminating all development related information to the interested people.

PMU may play important roles in implementing this program. The following functions seem particularly relevant:

- 1) to provide technical assistance to municipalities and sanitary district administrations for the preparation of local development plans and landuse plans,
- 2) to prepare simple standardized document formats and system for various data necessary for development management, including monitoring and evaluation of project/program implementation, and
- 3) to organize training seminars and workshops as mentioned above.

CHAPTER 7

ACTION PLAN

Four kinds of activities should be undertaken, subsequent to the submission of the LNE-UE Master Plan. They are (1) adoption of the Master Plan, (2) promotion of the Master Plan (3) project formulation studies of some core projects, and (4) implementation of other core projects.

7.1 Master Plan Adoption and Promotion

The bulk of development projects and related measures proposed by the LNE-UE Master Plan can be implemented within the competence and policies of sector agencies. However, the coordination of various development efforts by many agencies and timely implementation of core projects will have to be assured. For this purpose, Master Plan proposals will have to be discussed first among related agencies, sectoral concerns and conflicts resolved, and the Master Plan formally adopted, if necessary with addenda.

Initial steps to be taken, immediately following the Master Plan submission are shown in Table 7.1. In these steps, NESDB should play key roles as shown. In particular, the establishment of a Project Management Unit (PMU) based on the two regional centers of NESDB is proposed to facilitate the regional/provincial level coordination and to provide technical assistance to local administrations for plan/project formulation (Section 6.5).

In parallel with these steps, the Master Plan proposals should be disseminated widely to facilitate implementation and to cultivate public acceptance. The following may be particularly effective:

- 1) implementation of orientation seminars to convey the Master Plan proposals to a wide range of people such as politicians, local government officials, prospective investors, NGO's, environmentalists and researchers as well as general public,
- 2) preparation of publicity materials such as brochures and videos,
- 3) drafting of promotion materials for selected priority projects/programs,
- 4) launching of a series of TV programs combining video presentation, plan schematics and commentaries by various people, and
- 5) organization of international donors meeting and investment promotion committee by public-private cooperation.

Table 7.1 Initial Steps in the Action Plan for LNE-UE Master Plan Implementation

Step	Action	By whom
1	Prepare a policy document recommending adoption of the Master Plan objectives and strategy in principle and requesting approval	NESDB NESDC
2	Adopt the Master Plan objectives and strategy in principle as a national policy	Prime Minister (Cabinet)
3	Convene National Regional Development Committee to resolve sectoral concerns and conflicts related to Master Plan proposals	Chairman (Prime Minister)
4	Take legislative measures necessary for the streamlining of NESDB functions and the establishment of PMU	Prime Minister
5	Appoint the Director of PMU	Secretary General of NESDB
6	Establish PMU and organize it with key staff	Director of PMU
7	Organize LNE-UE council and resolve fundamental issues related to Master Plan implementation	Director of PMU
8	Establish local support and advisory base	PMU

7.2 Core Projects Formulation and Implementation

(1) Regional/inter-regional projects

All the regional/inter-regional projects designated by the Master Plan as the core projects can be implemented by relevant sector agencies, following the implementation phasing indicated by the Master Plan (Table 6.1). For most of them, project formulation including feasibility studies and design can be conducted also by the sector agencies.

For the regional artery establishment and the small pumping reservoirs development, pre-feasibility level analyses have been conducted as part of the master planning. Further project development can be undertaken by sector agencies in line with these preliminary analyses. A feasibility study needs to be carried out for the Second Mekong bridge within the framework of the Master Plan. Stage-wise development of local air services network may be clarified first by NESDB and other related agencies before its implementation.

For the railway improvement and the route no.24 improvement, existing programs should be reviewed in the light of the Master Plan to fix the implementation schedule as well as design. Other projects should be implemented as already planned by respective sector agencies.

(2) Area development programs

Greater Nakhon Ratchasima Industrial Center Development

The Nakhon Ratchasima integrated urban development has been formulated at preliminary level as part of the master planning. Each component project should be further developed and immediately implemented by relevant sector agencies in cooperation with the CAO and the municipality.

Existing program for the natural gas pipeline extension and the co-generation system should be reviewed in the light of the Master Plan. A feasibility study and design should be completed in Phase I for the co-generation system.

A feasibility study should be carried out by either NESDB or the Ministry of Industry for the Nakhon Ratchasima industrial modernization (or small industry district). NESDB, in cooperation with other related agencies, should take the initiative to invite the private sector to prepare jointly a plan for the Khao Yai resort and research development and to work out implementing arrangements.

Ubon Ratchathani Agro-Industrial Forefront Development

For the Ubon Ratchathani integrated urban development and the border trade center development, NESDB should provide technical assistance to the CAO and the municipal government for project formulation. For the Lam Don Yai/Huai Tha multipurpose development, NESDB should take the initiative for a comprehensive development and management study, coordinate activities of related agencies, and monitor the implementation.

The "Teleport" can be implemented by TOT within the framework of the Master Plan, possibly in cooperation with a foreign corporation. The private sector initiative to establish the "Agropolis" may be assisted by provincial governments and NESDB for planning and implementing arrangements.

Buri Ram-Surin Integrated Central Area Development

The Buri Ram international airport and the Northeast industrial promotion sub-center should be further elaborated respectively by AAT and the Ministry of Industry (Depart of Industrial Promotion) in line with the Master Plan. For the Lam Nam Chi/Lam Plai Mat multipurpose development, NESDB should take the initiative to conduct first a comprehensive development and management study. For the Buri Ram-Surin twin city development, NESDB should provide technical assistance to the provincial governments and the municipalities for project formulation.

(3) Special sector programs

Agricultural Diversification Program (ADIP)

An inter-agency task force should be formed with NESDB for program formation based on the Master Plan. The drip irrigation project has been studied at preliminary level as part of the master planning. A joint public-private committee should be established in each province with the initiative of the provincial governments supported by NESDB to identify project area with implementing arrangements. For

the crop cycle research, subject matter institutes should be designated and research programs prepared based on the Master Plan.

Rural Environment Enhancement Program (REEP)

Implementation programs should be worked out by the Tambon Rural Development Committees with participation of farmers' representatives. They would be reviewed at provincial level. In this review, NESDB would be in a position to ensure that component projects are consistent mutually and with other related projects such as those in the ADIP. Component projects will be programmed by relevant sector agencies for implementation.

Broad Based Border Activities Promotion Program

An inter-agency task force should be formed with NESDB to draft the Isarn-Indochina in-bond program. This would provide the basis for negotiations with neighboring countries. For other projects, NESDB should extend technical assistance to the relevant municipalities for the preparation of development plans.

7.3 Immediate Actions and Phase I Budget

Immediate actions to be taken for all the core projects are summarized in Table 7.2 together with budget allocation during Phase I. For those projects to be implemented during Phase I, the budget allocation covers initial investment as well as further project formulation. For other projects for which only studies are recommended for Phase I, only indicative allocation is given.

The total investment requirements for all the core projects are 19,950 million bahts during Phase I, corresponding to 23% of the projected total public investment allocation to LNE-UE (subsection 6.5.1). Early implementation of those projects would be essential to transform the development structure of the LNE-UE regions.

Steps for implementation of the core projects are shown in Table 7.3. Outlines of the selected priority projects for which pre-feasibility analyses were carried out are presented in Table 7.4.

Table 7.2 Immediate Actions to Implement the LNE-UE Master Plan and Phase I Budget (1/3)

No. Project/Program	Immediate Actions	Phase I Budget (million baht)
<u>Regional/inter-regional projects</u>		
R.1 Regional artery establishment	• Programing of initial link between LNE and UE (Sa Kaeo - Buri Ram/Surin border)	1,700
R.2 Railway improvement	• Review of existing program in light of M/P	100
R.3 Route no.24 improvement	• --- ditto ---	500
R.4 Second Mekong bridge	• F/S	100
R.5 Local air services network development	• Study to clarify stage-wise development	100
R.6 Small pumping reservoirs development	• Preparation of I/P for identified schemes followed by implementation	2,700
R.7 Phanom Dong Rek water resources development	• Acceleration of implementation	1,400
R.8 Lam Thakong pumped storage power generation	• Programming of stage 1	5,300
R.9 Pak Mun hydropower	• --- ditto ---	*
Sub-total		<u>11,900</u>
<u>Area Development Programs</u>		
<u>Greater Nakhon Ratchasima Industrial Center Development</u>		
1.1 Nakhon Ratchasima IUD	• Project elaboration through NESDB technical assistance to local governments based on M/P	800
1.2 Nakhon Ratchasima industrial modernization	• F/S by NESDB/MOI based on M/P to be followed by implementation	50
1.3 Natural gas pipeline extension	• Review of existing program for early implementation	*
1.4 Co-generation system	• Review of existing program and F/S	100
1.5 Khao Yai resort and research development	• Plan formulation and implementing arrangement by public-private partnership with NESDB initiative	100

Table 7.2 Immediate Actions to Implement the LNE-UE Master Plan and Phase I Budget (2/3)

No. Project/Program	Immediate Actions	Phase I Budget (million baht)
<u>Ubon Ratchathani Agro-Industrial Forefront Development</u>		
2.1 Ubon Ratchathani IUD	<ul style="list-style-type: none"> • Project formulation based on M/P through NESDB technical assistance to local governments 	400
2.2 "Teleport"	<ul style="list-style-type: none"> • Detailed planning based on M/P by TOT (in cooperation with foreign corporation) 	200
2.3 "Agropolis"	<ul style="list-style-type: none"> • Planning by private sector and implementing arrangement assisted by NESDB 	50
2.4 Border trade center development	<ul style="list-style-type: none"> • Project formulation through NESDB technical assistance to local government 	50
2.5 Lam Dam Yai/Huai Tha multipurpose development	<ul style="list-style-type: none"> • Comprehensive development and management study by NESDB 	100
<u>Buri Ram-Surin Integrated Central Area Development</u>		
3.1 Buri Ram international airport	<ul style="list-style-type: none"> • Detailed planning to be followed by implementation as local airport 	100
3.2 Northeast industrial promotion subcenter	<ul style="list-style-type: none"> • Detailed planning by MOI (DIP) 	50
3.3 Lam Nam Chi/Lam Plai Mat multipurpose development	<ul style="list-style-type: none"> • Comprehensive development and management study by NESDB 	100
3.4 Buri Ram-Surin twin city development	<ul style="list-style-type: none"> • Project formulation based on M/P through NESDB technical assistance to local governments 	200
Subtotal		<u>2,300</u>
<u>Special Sector Programs</u>		
Agricultural Diversification Program (ADIP)	<ul style="list-style-type: none"> • Program formation based on M/P by inter-agency task force with NESDB 	800
- Drip irrigation development	<ul style="list-style-type: none"> • Preparation of I/P by public-private committee by province 	2,300
- Crop cycles research	<ul style="list-style-type: none"> • Designation of subject matter institute(s) and research program preparation based on M/P 	

Table 7.2 Immediate Actions to Implement the LNE-UE Master Plan and Phase I Budget (3/3)

No. Project/Program	Immediate Actions	Phase I Budget (million baht)
Rural Environment Enhancement Program (REEP) - Revised water jar program	<ul style="list-style-type: none"> • Preparation of I/P by Tambon Rural Development Committee with farmers' participation • Identification study for problem areas to determine needs for and applicability of larger containers 	2,000
Broad Based Border Activities Promotion Program	<ul style="list-style-type: none"> • Drafting of Isarn-Indochina in-bond program by inter-agency task force with NESDB 	*
Subtotal		5,100
<u>Other local projects</u>		
Nakhon Nayok/Prachin Buri multipurpose development	<ul style="list-style-type: none"> • Comprehensive development and management study including land use plan 	50
Yasothon water network development	<ul style="list-style-type: none"> • Comprehensive development and management study 	100
Yasothon aquaculture center	<ul style="list-style-type: none"> • Project formulation coordinated with Mekong Secretariat 	50
Groundwater exploration	<ul style="list-style-type: none"> • Review of DMR data to identify more promising areas 	*
Huai Bang Sai multipurpose development	<ul style="list-style-type: none"> • F/S to be followed by initial implementation 	50
Mukdahan IUD/border trade center	<ul style="list-style-type: none"> • Project formulation based on M/P through NESDB technical assistance to local governments 	200
Aranyaprathet IUD/border trade center	<ul style="list-style-type: none"> • Project formulation based on M/P through NESDB technical assistance to local governments 	200
Subtotal		650
Total		19,950

* Costs to be incurred but not estimated; some costs included in other projects.

Table 7.3 Steps for Implementation of Core Projects

◊ study, design, implementing arrangement, review etc.
● implementation

Project	Phase I (~1996)	Phase II (1997~2001)	Phase III (2002~2010)
R.1 Regional Artery establishment (New Indochina gateway road)	●	●	
R.2 Railway improvement	◊ ●	●	●
R.3 Route no.24 improvement	●	●	●
R.4 Second Mekong bridge	◊	◊ ●	●
R.5 Local air services network development	●	●	
R.6 Small pumping reservoirs development	● ◊	● ◊	●
R.7 Phanom Dong Rek water resources development	●	●	
R.8 Lam Thakong pumped storage generation	●	●	
R.9 Pak Mun hydropower	●	●	
1.1 Nakhon Ratchasima integrated urban development	◊ ●	●	● ◊
- Regional truck terminal	◊ ●	●	●
- Commerce and industry plaza	◊	●	
- Automobile test course		◊	●
1.2 Nakhon Ratchasima Industrial Modernization (Small industry district)	●	●	
1.3 Natural gas pipeling extension	●		
1.4 Co-generation system	◊	●	
1.5 Khao Yai resort and research development	◊	●	●
2.1 Ubon Ratchathani integrated urban development	◊ ●	●	
- Regional truck terminal	◊	●	
- Commerce and Industry plaza	◊	●	
2.2 Teleport	◊ ●	●	●
2.3 "Agropolis"	◊	●	●
2.4 Border trade center development	◊ ●	●	
2.5 Lam Don Yai/Huai Tha multi-purpose development	◊	● ◊	●
3.1 Buri Ram International airport	●	●	
3.2 Northeast industrial promotion sub-center	◊ ●	●	
3.3 Lam Nam Chi/Lam Plai Mat multi-purpose development	◊ ●	● ◊	●
• Green wedge development	●	●	●
• Elephant park establishment	◊	●	
• Khmer ruins upgrading	●	●	
3.4 Buri Ram - Surin twin city development	◊	●	●

Table 7.4 Outline of Selected Priority Projects *

Projects	Objective	Outline	Investment cost (10 ⁶ Baht)
Regional artery establishment	To establish a regional artery from the northern part of the Upper East region to Mukdahan passing through the poorest central part of the Lower Northeast to promote various economic activities along the route	<ul style="list-style-type: none"> - Forecast traffic volume: 12,000 VT/day in 2000 16,000 VT/day in 2010 - Total length : 635.2 km Laem Chabang - Sa Kaco : 163.3 km Sa Kaco - Nang Rong : 154.8 km Nang Rong - Suwannaphum : 161.2 km Suwannaphum - Mukdahan : 155.9 km - Economic internal rate of return: - Total : 10.5% - Laem Chabang - Nang Rong section : 10.3% 	Phase I (~1996): 1,700 Phase II (~2001): 6,900 Total : 8,600
Small pumping reservoirs development	To expand the water availability in LNE-UE during the dry season to support various activities in both rural and urban areas by constructing small reservoirs connected to river systems	<ul style="list-style-type: none"> - Number of selected sites Nakhon Ratchasima : 5 Buri Ram : 3 Surin : 2 Si Sa Ket : 2 Ubon Ratchathani : 2 Yasothon : 3 Mukdahan : 3 Nakhon Nayok : 2 Prachin Buri : 6 Total : 30 - Scale of reservoirs - inundation area : 1 to 25 ha - storage capacity : 70,000 to 2,000,000 m³ - Economic internal rate of return : 11.7% 	Phase I (~1996): 2,700 Phase II (~2001): 6,500 Total : 9,200
Integrated urban development program	The following objectives will be pursued in an integrated manner. <ol style="list-style-type: none"> (1) Review and modification of existing land use plans (2) Development and improvement of various urban infrastructure and utility facilities (3) Enhancement of institutional and financial capabilities for better urban management 	<ul style="list-style-type: none"> - An integrated urban development program was prepared for Nakhon Ratchasima at the pre-feasibility analysis level - Population framework : 1 million in 2010 - The existing land use plan prepared by DTCP was reviewed and modified in light of the new population framework, anticipated functions of the city in the future and various projects proposed by the master plan. - Individual infrastructure projects water supply: expansion to 140,000 m³/day capacity by 2001 wastewater-drainage: expansion to 60,000 m³/day capacity by 2001 solid waste: expansion of garbage collection capacity to 150,000 tons/day and construction of an additional disposal site by 2001 	Phase I (~1996): 800 Phase II (~2001): 1,800 Total : 2,600

Projects	Objective	Outline	Investment cost (10 ⁶ Baht)
		<p>electricity: installation of street lights</p> <p>telecommunication: expansion of telephone network coverage, enhancement of mobile telephone system and improvement in telecommunication services</p> <p>urban roads: improvement of the existing roads, construction of fly overs, street lighting etc.</p> <p>Other non-infrastructure type projects include industry modernization, regional truck terminal, industry and commerce plaza and agriculture marketing improvement.</p>	
Drip irrigation development	To increase farm income and improve nutrition level of local people through crop diversification centering on oil crops and vegetables applying drip irrigation technology	<p><u>Component / measures</u></p> <p>(1) Development of water sources ... small pond, small pumping reservoir or groundwater,</p> <p>(2) Introduction of drip irrigation system with application device for water, fertilizer and chemicals,</p> <p>(3) Agricultural credit by BAAC,</p> <p>(4) Establishment of a joint public-private committee in each province to plan, implement and manage the project,</p> <p>(5) Farmers' involvement and commitment throughout the project cycle: planning for sub-projects, construction, maintenance, cost recovery, marketing and information exchange through existing or new farmers' organizations</p> <p>(6) Establishment of marketing outlet to traders or processors.</p> <p>Internal rate of return : 14.0%</p>	<p>Phase I (~1996): 2,300</p> <p>Phase II (~2001): 10,500</p> <p>Total : 12,800</p>
Private agro-processing projects	<ul style="list-style-type: none"> - Increase of dairy products production - Increase of processed meat production - Increase of animal feed production 	<ul style="list-style-type: none"> - Production of yogurt and milk from 29,000 tons raw milk at the full operation stage (IRR : 47%) - Production of pork (3,500 tons/year) and beef (4,500 tons/year) at the full operation stage (IRR : 26%) - Production of animal feed at 230,000 tons per year at the full operation stage (IRR : 79%) 	<p>185</p> <p>137</p> <p>104</p>

Note: * Projects for which pre-feasibility analysis were conducted.

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