

JAPAN INTERNATIONAL COOPERATION AGENCY  
LAO PEOPLE'S DEMOCRATIC REPUBLIC  
MINISTRY OF AGRICULTURE AND FORESTRY

No. 1

BASIC DESIGN STUDY REPORT  
ON  
THE INTEGRATED AGRICULTURAL RURAL  
DEVELOPMENT PROJECT  
IN  
SAVANNAKHET PROVINCE  
IN  
LAO PEOPLE'S DEMOCRATIC REPUBLIC  
MAIN REPORT

SEPTEMBER, 1993

KOKUSAI KOGYO CO., LTD.

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JAPAN INTERNATIONAL COOPERATION AGENCY  
LAO PEOPLE'S DEMOCRATIC REPUBLIC MINISTRY OF  
AGRICULTURE AND FORESTRY

BASIC DESIGN STUDY REPORT ON THE INTEGRATED AGRICULTURAL RURAL  
DEVELOPMENT PROJECT IN SAVANNAKHET PROVINCE MAIN REPORT

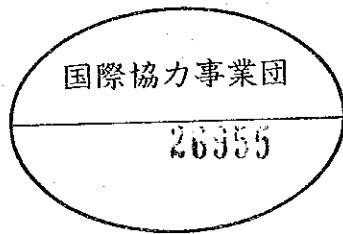
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## P R E F A C E

In response to a request from the Government of Lao People's Democratic Republic, the Government of Japan decided to conduct a basic design study on the Integrated Agricultural Rural Development Project in Savannakhet province and entrusted the study to the Japan International Cooperation Agency ( JICA ).

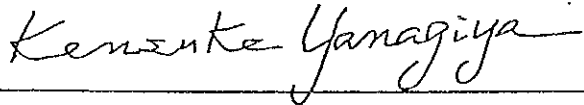
JICA sent to Lao a study team headed by Mr. Haruoki Ebe, Deputy Director, Chikugo River Irrigation and Drainage Project Office, Ministry of Agriculture, Forestry and Fisheries and constituted by members of Kokusai Kogyo, Co., Ltd from May 19 to June 12, 1993.

The team held discussions with the officials concerned of the Government of Lao, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Lao in order to discuss a draft report, and as a result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Lao People's Democratic Republic for the close cooperation they extended to the team.

September 30, 1993.



---

Kensuke Yanagiya  
President

Japan International Cooperation Agency





Mr. Kensuke Yanagiya  
President  
Japan International Cooperation Agency  
Tokyo, Japan

September 30, 1993

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Integrated Agricultural Rural Development Project in Savannakhet Province in Lao People's Democratic Republic.

The study was conducted by Kokusai Kogyo Co., Ltd. under a contract to JICA, during the period May 12 to September 30, 1993. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Lao and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs, Ministry of Agriculture, Forestry and Fisheries, and Embassy of Lao People's Democratic Republic. We also wish to express our deep gratitude to the officials concerned of Ministry of Agriculture and Forestry of Lao, the Bureau of Agriculture and Forestry of Savannakhet Province and the Embassy of Japan in Lao for their close cooperation and assistance throughout our field survey.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

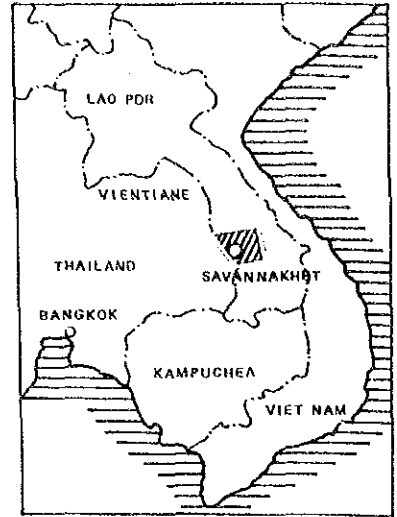
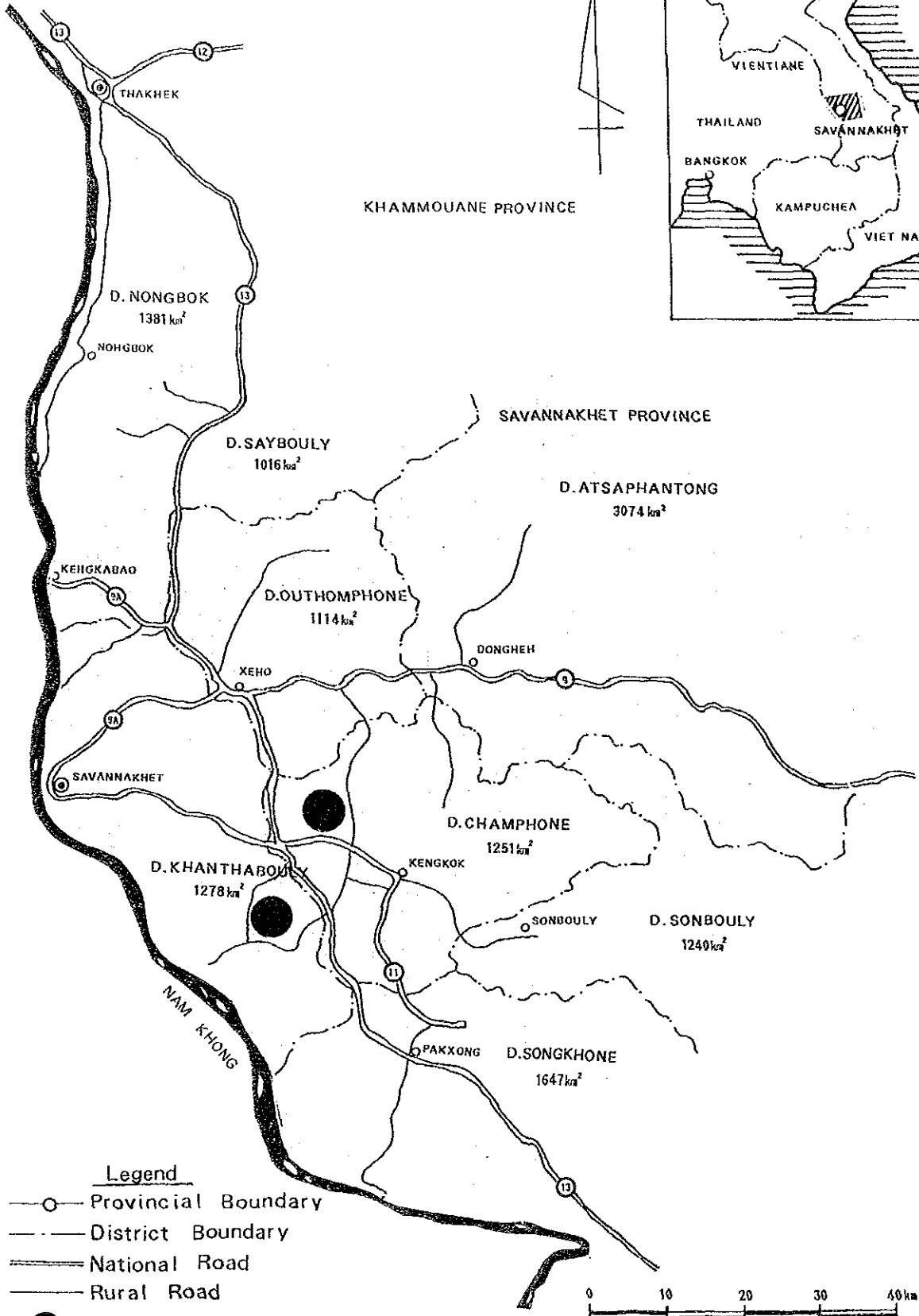
*Sakuzo Kanazawa*  
Sakuzo Kanazawa

Project manager

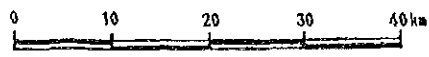
Basic design study team on  
the Integrated Agricultural Rural  
Development Project in Savannakhet  
Province  
Kokusai Kogyo Co., Ltd.



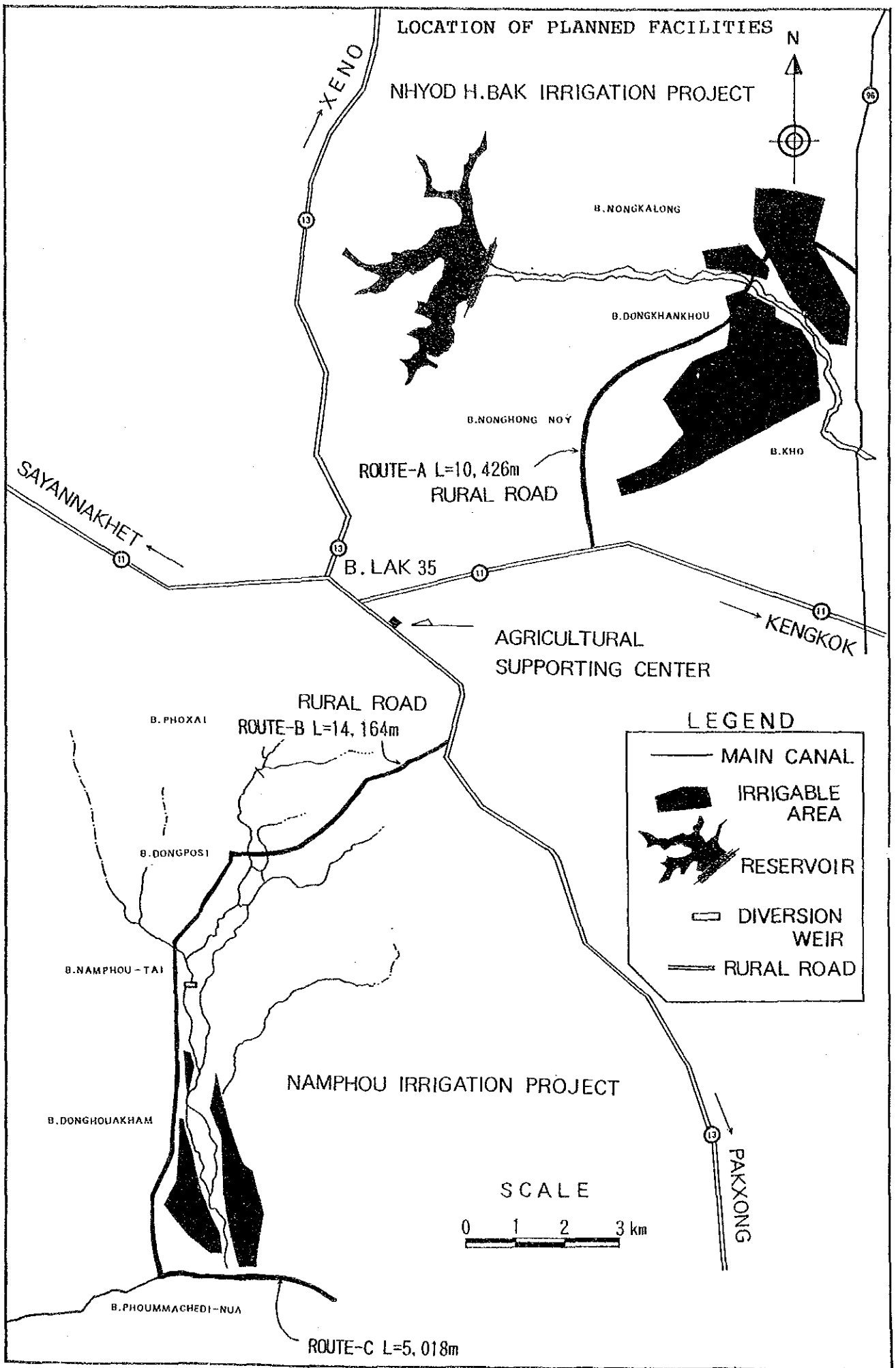
THE INTEGRATED AGRICULTURAL RURAL DEVELOPMENT  
PROJECT IN SAVANNAKHET PROVINCE  
« LOCATION MAP »

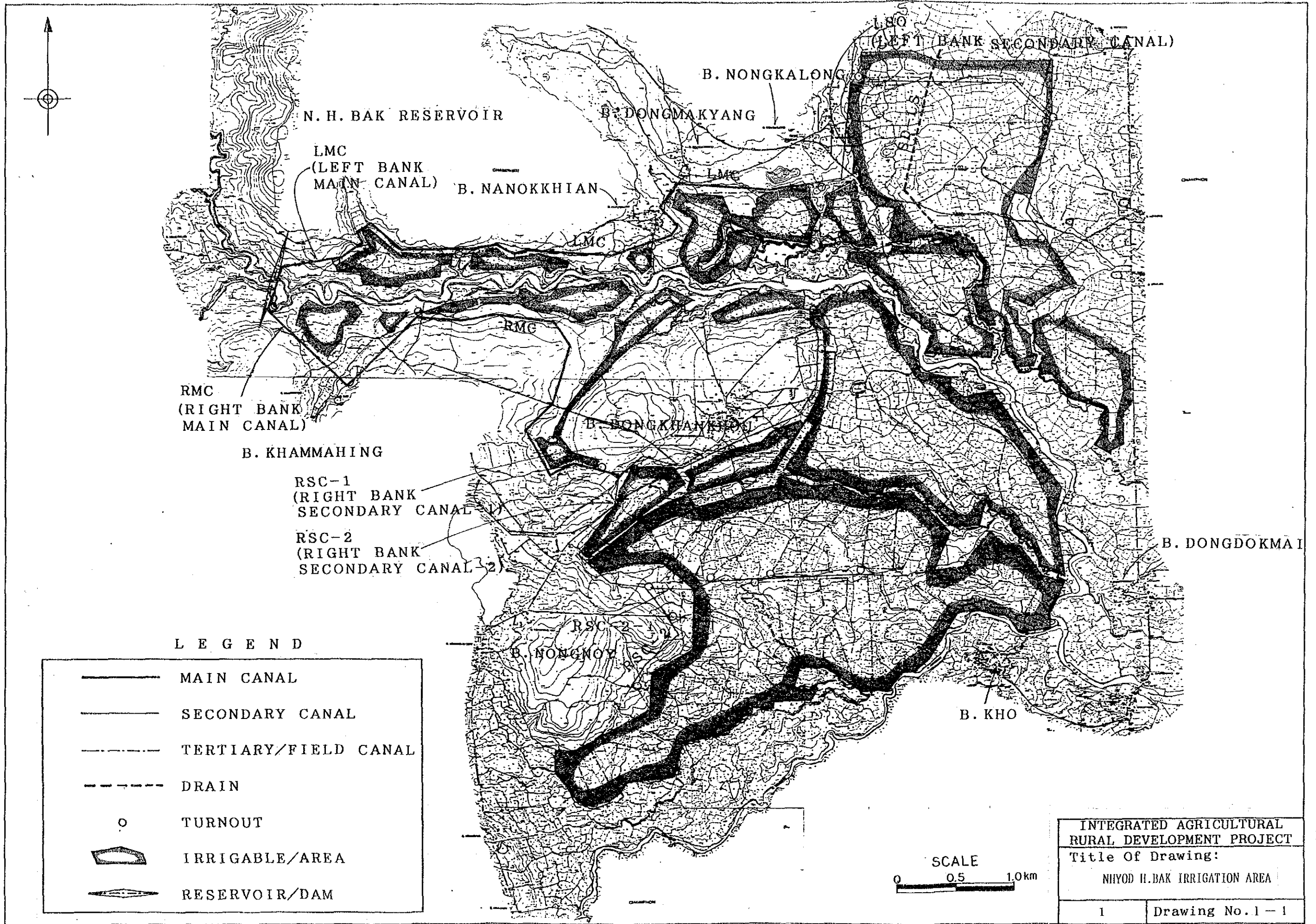


- Legend**
- Provincial Boundary
  - District Boundary
  - ==== National Road
  - Rural Road
  - Project Area









N. H. BAK RESERVOIR

B. NONGKALONG

B. DONGMAKYANG

LSC  
(LEFT BANK SECONDARY CANAL)

LMC  
(LEFT BANK  
MAIN CANAL)

B. NANOKKHIAN

RMC  
(RIGHT BANK  
MAIN CANAL)

B. KHAMMAHING

RSC-1  
(RIGHT BANK  
SECONDARY CANAL 1)

RSC-2  
(RIGHT BANK  
SECONDARY CANAL 2)

B. NONGKHANKEE

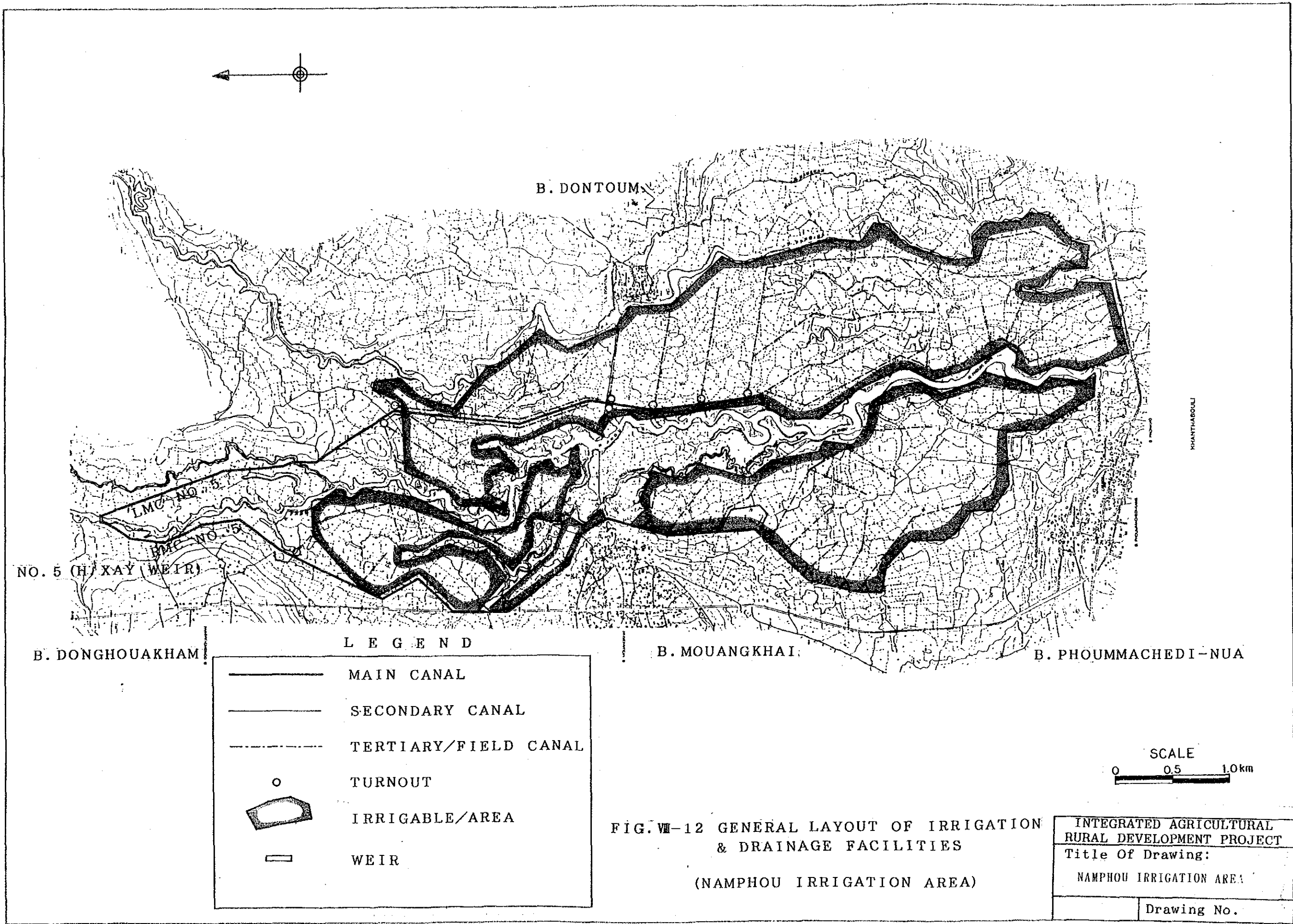
B. DONGDOKMAI

L E G E N D

- MAIN CANAL
- SECONDARY CANAL
- TERTIARY/FIELD CANAL
- DRAIN
- o TURNOUT
- ▭ IRRIGABLE/AREA
- ▭ RESERVOIR/DAM

SCALE  
0 0.5 1.0km

INTEGRATED AGRICULTURAL RURAL DEVELOPMENT PROJECT	
Title Of Drawing:	
NHYOD H. BAK IRRIGATION AREA	
1	Drawing No. 1 - 1



B. DONTUOM

NO. 5 (H) XAY (WEIR)

LMC NO. 5  
BMP NO. 5

B. DONGHOUAKHAM

L E G E N D

	MAIN CANAL
	SECONDARY CANAL
	TERTIARY/FIELD CANAL
	TURNOUT
	IRRIGABLE/AREA
	WEIR

B. MOUANGKHAI

B. PHOUMMACHEDI-NUA

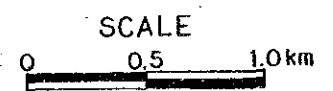


FIG. VII-12 GENERAL LAYOUT OF IRRIGATION & DRAINAGE FACILITIES  
(NAMPHOU IRRIGATION AREA)

INTEGRATED AGRICULTURAL RURAL DEVELOPMENT PROJECT	
Title Of Drawing:	
NAMPHOU IRRIGATION AREA	
	Drawing No.







Photo 1. Proposed Irrigation area



Photo 2. Proposed H. Bak Dam site (H. Bak River)



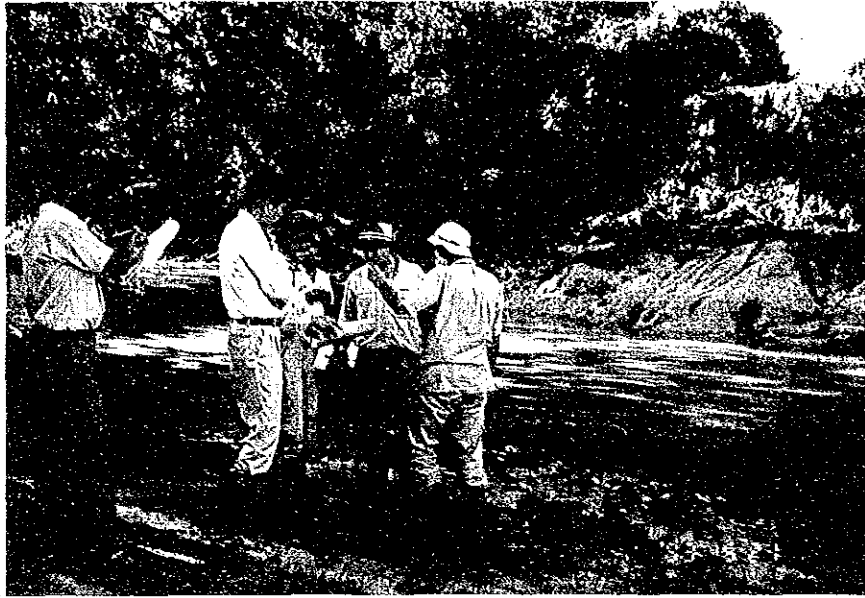


Photo 3. Proposed H. Xay Diversion weir site (H. Xay River)

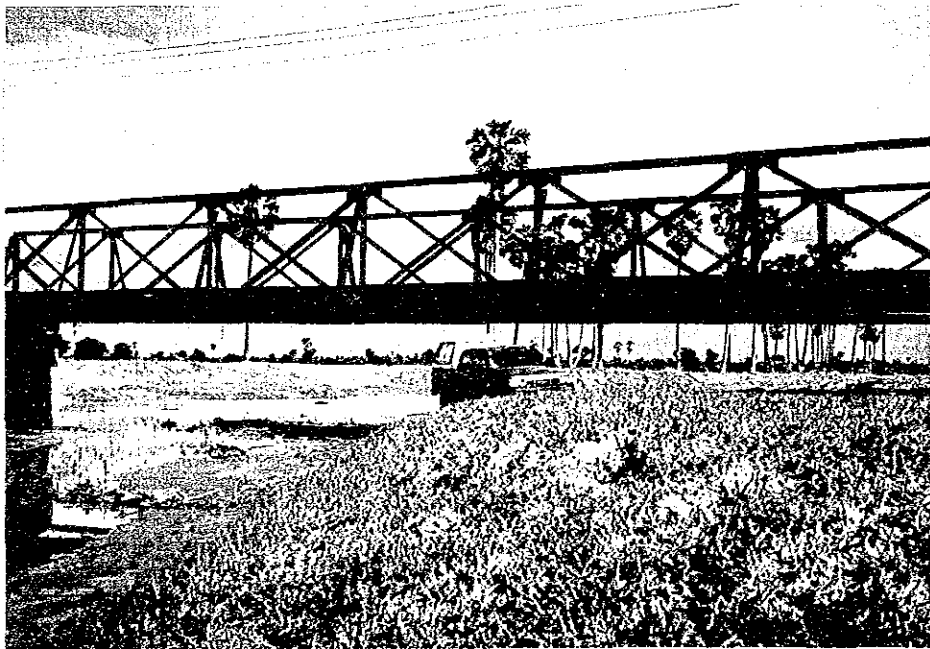


Photo 4. Damaged and impassable truss bridge in rural road(Route C)



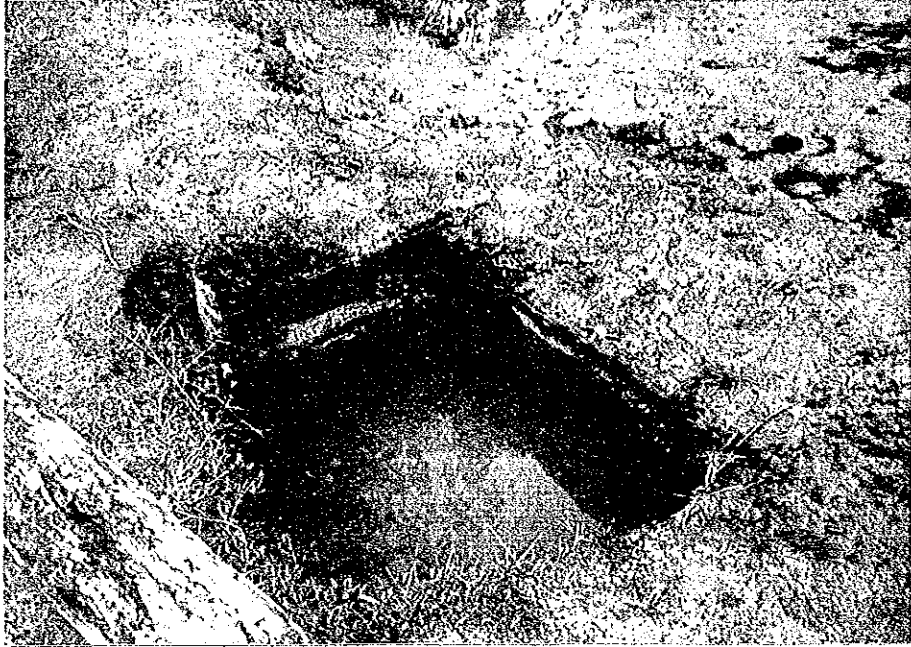


Photo 5. Rural public well(unclear water)



Photo 6 Proposed Agricultural Spporting Center construction site



## S U M M A R Y

Lao People's Democratic Republic (Lao P.D.R.) is an inland country surrounded by Thailand, Myanmar, China, Vietnam and Cambodia. It is located in the northern part of the Indochinese peninsula. The land area of the country is about 236,800 km<sup>2</sup>. About 4.17 million people (1990) reside in this area. The real GDP per capita is US \$143, showing a economic growth rate of 9% in 1989.

Since independence in 1975, the government has fostered a centrally-controlled economy. Though the goal of the First Five Year National Development Plan (1981-1985) was largely attained through the steady growth of agricultural production and the generation of electric power, the heavy drought and floods (1987-1988) encountered during the Second Five-Year National Development Plan caused a decrease in the country's export of electricity and heavy damage to rice production, leading to the bankruptcy of government-owned corporations with less than half of the plan's target attained. Though rice production has since regained, the establishment of a self-sufficient system in the country is far from being attained.

Agricultural industry in Laos covers 60% of the GDP and 72% of the population. Therefore, a slump in agricultural production would extremely and significantly affect the nation's economy.

The Government of the Lao P.D.R. decided in the 4th convention held in November 1986 that it would reconstruct the nation's economy by enacting the New Economic Mechanism (NEM) in order to shift from a centrally-planned economy to a market economy.

The Third Five-Year National Development Plan (1991-1995), which takes into account the past failures, is based on NEM, and considers the following most important in the nation's agriculture.

- 1) Establishment and stabilization of agricultural production, and improvement of the land registration system in which private ownership is allowed;

- 2) Systematizing market of agricultural products, and opening domestic, and overseas markets;
- 3) Privatization of state-owned corporations;
- 4) Completion of the transportation network, which is indispensable to the development of a market economy;
- 5) Expansion of frontier trade and promotion of trade liberalization;
- 6) Expansion of agricultural production by improving the agricultural taxation structure;
- 7) Fostering effective innovation by organizations for research, extension, and training systems;
- 8) Reduction in the number of departments and bureaus in the Ministry of Agriculture and Forestry.

Agricultural development has been implemented according to the same basic policies as the first, second, and third five-year development plans. However, development was concentrated only in one area, the plateau of Vientiane, therefore it created sharp regional differences between urban areas and rural areas.

To improve these regional differences and to establish self-sufficiency in food production in each region, the Government decided to formulate an integrated agricultural development project in 1990 that would be implemented in Savannakhet Province, which is considered to have a large potential for agricultural development. The Government requested technical assistance to the Japanese Government in respect to the aforementioned development study.

Based on this request, the Government of Japan dispatched a Mission and a Scope of Work for the study was concluded on August 15, 1990. Based on this Scope of Work, JICA conducted the Master Plan Study and the Feasibility Study for the development plan for about a year and a half beginning in November, 1990.

The Government of Lao P.D.R. requested for grant aid to the Government of Japan in June 1992 based on the results of the above-mentioned studies. In response, the Government of Japan decided to carry out a Basic Design Study which was conducted by



JICA over a period of 4.5 months, from May to September 1993.

Agriculture is the key industry supporting the economy of the Lao P.D.R. The annual production of rice, the main staple food, is about 1.45 million tons, an amount considered sufficient enough to support the nation. However, production is unstable because of its dependence on weather conditions.

More than 90% of the rice produced in the Lao P.D.R. is glutinous rice harvested in the rainy season. Crop harvests in the rainy season are extremely uncertain owing to varying weather conditions in that season. Furthermore, it is said that the expansion of acreage for cultivation through agricultural development has reached its limit.

Two years of consecutive natural disasters in 1987 and 1988 dealt the economy and the Government a great blow, especially since the latter had just announced the successful achievement of self-sufficiency in food production.

The objective of the Request is to achieve the following items through the construction of irrigation systems in the H. Bak upstream area and the Namphou area in Savannakhet Province, an agricultural supporting center rural roads (including rehabilitation of existing roads) and water supply facilities as well as the supply of machinery and equipment.

- 1) Stabilization of rice production, especially in the rainy season, and improvement of its productivity
- 2) Expansion of the dry season planting acreage and crop diversification
- 3) Diffusion and expansion of new production methods and agricultural technologies, and the promotion and support of the farmers' agricultural production activities
- 4) Smooth distribution of agricultural produce throughout the region
- 5) Improvement of the living standard and the conditions of health and sanitary of residents in the neighboring villages

The requested facilities and equipment are as mentioned below:

1) Irrigation facilities (for both H. Bak and Namphou areas)

Areas to be irrigated	:	1,660 ha
Dam and reservoir	:	7 places
canal	:	26 km
Drainage canal	:	2 km
Demonstration farm	:	58 ha

2) Rural infrastructures and water supply system

Rural roads  
Rural water supply facilities

3) Agricultural Supporting Center

Buildings  
Fry-breeding facilities

4) Machinery and equipment

Operation and Maintenance (O/M) equipment  
Auxiliary equipment for Agricultural Supporting Center

The area targeted by this request is located in approximately 500 km southeast of Vientiane of the national capital city, and 35-40 km southeast of Savannakhet city, and is situated between 16 10' -16 32' of north latitude.

There are two major seasons: the rainy season which extends from mid-May through mid-October, and the dry season which extends from mid-October to mid-May.

Annual precipitation is 1,713 mm in Xeno and 1,384 mm in Savannakhet Province. The agricultural population in Savannakhet Province is 556,645, approximately 91% of the total provincial population of 611,461 (1990). Agriculture contributes 75,501,504 kips (1990), which is 85% of the provincial GDP, and is the most important industry in Savannakhet Province.

The breakdown of the agricultural sector is 43% for agricultural produce, 54% for livestock and 3% for forestry.

In 1990, the cultivated acreage and production output of the main crops in Savannakhet Province were as follows:

Crops	Acreage (ha)	Output (t)
-------	--------------	------------

Rice	81,495	222,574
Sweet potatoes	1,080	16,840
Corn	3,435	5,840
Vegetables	670	5,628

Sugar cane, tobacco, peanuts, cotton, and cardamon follow the above crops.

The current rice production conditions and the farmer's household economy in the upstream of H. Bak (Champhone district) and the Namphou area (Khantabouly district) are summarized as follows:

Total number of households	2,504 families
Population	13,753 persons
Paddy area	2,727 ha
Rice production	4,516 tons
Yield unit	1.92 t/ha (H. Bak)
	1.28 t/ha (Namphou)

Income	
Crop	57.0 %
Rice	53.6 %
Others	3.4 %
Livestock	22.0 %
Salary and wages	11.5 %
Handicraft	2.8 %
Remittance and others	6.7 %

Based on the request, both parties have conferred and reached an agreement concerning the scope of the basic design study, as shown below.

- Construction of irrigation facilities

Areas to be covered by irrigation

Total areas to be covered:	1360 ha
H.Bak upstream area:	950 ha
Namphou (Upstream area of H. Xay):	410 ha

- H.Bak upstream area

- H. Bak upstream area

Dam : Type: earth dam  
Dam height: 24 m  
Dam length: 912 m

canal: Trapezoidal earth canal: Total length of 22 km

Drainage canal:

Trapezoidal earth canal: Total length of 2 km

- Namphou area ( H. Xay upstream)

Weir: Floating type

canal: Trapezoidal earth canal: Total length of 8 km

- Improvement of agricultural infrastructure

Rural roads: Laterite pavement: Total length of 30 km

Rural water supply wells:

Dug well: 10-15 m deep, installed in 10 places

- Construction of Agricultural Supporting Center

Construction of buildings and facilities:

Office Building, Exhibition room , multipurpose facilities  
(A: Building, B: Open space), garage, generator house, water  
supply facilities, Janitor house and Fry breeding  
facilities.

Supply of machinery and equipment

O/M equipment:

Backhoes, bulldozers, wheel loader shovels, dump trucks  
motor grader, vibrocompactor, and other equipment

Supporting Center facilities:

Manually operated tractor, threshing machine,  
pickup truck, motorcycle, equipment for  
meteorological observation and other facilities

This project will be carried out in two phases as follows.

- 1st phase (12 months)

Construction of irrigation facilities for Namphou area  
(weir and canals)  
Construction of Agricultural Supporting Center  
Supply of machinery and equipment (power generator for  
the center)

- 2nd phase (12 months)

Construction of irrigation facilities for H. Bak  
upstream area (dam and canals)  
Improvement of rural infrastructures (rural roads and  
wells), and supply of machinery and equipment  
(excluding power generator for the center)

The implementation of this project under the Japanese Grant Aid  
program will require the Government of the Lao P.D.R. to shoulder  
the following expenses:

1st phase	:	34,409,000 kips
2nd phase	:	248,340,000 kips
Total		282,749,000 kips

The executing agencies of the project are the Ministry of  
Agriculture and Forestry and the Savannakhet Province (Department  
of Agriculture and Forestry).

The benefits that can be expected from this scheme are the  
following:

A. National benefits:

- 1) To contribute to the attainment of the nation's  
objective, which is self-sufficiency in food

production, through increased and stable food production;

- 2) To contribute to the establishment of an autonomous economic diplomacy based on self-sufficiency in food;
- 3) To contribute to the development and highly-advanced use of water and land resources;
- 4) To contribute to the decrease of the slash-and-burn cultivation practiced by lowland farmers through increase in rice production, and to preserve forest resources;
- 5) To bring about crop diversification, increased cultivation, and production of cash crops;
- 6) To contribute to the establishment of the NEM system through shipment and sales of products into the free market;
- 7) To bring about increased exports and foreign currency holdings and improved international balance of payments.

B. Regional Benefits:

- 1) To activate the economy of the area through free-sales activities;
- 2) To act as a pilot project for agricultural development projects to be carried out in other areas;
- 3) To develop the marketing of goods, transport and traffic services, and to promote interchanges between local communities;
- 4) To promote diffusion and expansion of modern farming techniques;
- 5) To improve women's social status through education and training, and to increase activities for the improvement of living conditions;
- 6) To popularize fish farming and to improve nutrition.

C. Farm households and Farmers' benefits:

- 1) To increase the income and to improve the standard of living of farmers through stable and expanded production, cultivation of commercial crops, and fish farming;
- 2) To contribute to the extension and improvement of farming techniques;
- 3) To encourage the farmers to break out of a self-sufficient agricultural system;
- 4) To diffuse agricultural information and to promote the reconstruction of an agricultural system that can cope with a market economy;
- 5) To increase women's participation in local and farming activities through training services and the reduction of work load and time for the transport of domestic water;
- 6) To increase children's school attendance through the reduction of work load and time for the transport of domestic water;
- 7) To reduce the spread of diseases and promote interchanges between local communities through the improvement of roads and domestic water supply facilities, the activation of the marketing system, and improvement of rural health and sanitary conditions.

This project aims to achieve the following through the combined efforts of the executing agencies and the local farmers:

- Improvement in food production, especially rainfed paddy production;
- Expansion of planted acreage in the dry season, and crop diversification;
- Improvement and diffusion of farming techniques;

- Support and promotion of farmers' agricultural production activities;
- Breakaway from a self-sufficient agriculture;
- Smooth marketing system in the area;
- Improvement in rural living conditions and health and sanitary conditions;
- Improvement in farmers' income and standard of living.

Since the project will contribute to the stabilization of the living conditions of the residents of the project area and the surrounding areas, activate regional economic activities, and promote the establishment of new rural infrastructures under a free market economy, the execution of this project under the Japanese Grant Aid program can be considered reasonable.

Operation and maintenance of each facilities and activities of the Agricultural Supporting Center will be carried out by the Laos side, and in order to accomplish the target of the project, positive activities are necessary.

Operation and maintenance of each facilities and management of the center should be carried out with adequate budgetary measures, personnel arrangement and annual work schedule.

It is recommended to implement the project with steady system of responsibility and mutual assistance.



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# CHAPTER 1



In June 1992, the Government of the Lao People's Democratic Republic requested "the Japan's Grant Aid" for the construction of planned facilities and provision of their materials and equipment for the Integrated Agricultural Rural Development Project in Savannakhet Province.

In response to this, the Government of Japan confirmed the background, details and suitability of the study along with deciding the extent of cooperation, scope of the most suitable substance of the study and details of the proposed cooperation and decided on the implementation of the Basic Design Study, in accordance with the grant aid conditions.

In compliance with these decisions, the Japanese International Cooperation Agency (hereinafter referred to as JICA) dispatched the Basic Design Study Team headed by Haruoki Ebe, Deputy Director, Chikugo River Irrigation and Drainage Project Office, Ministry of Agriculture, Forestry and Fisheries, to Lao P.D.R. from May 19 to June 12 of 1993, and also dispatched another group, to present the draft of the Basic Design Study report, headed by Masaru Sakai of the Bureau of Structural Improvement of the Ministry of Agriculture and Forestry to Lao P.D.R. from August 31 to September 8, 1993.

The Study Team conferred with the Vice Minister of the Ministry of Agriculture and Forestry and Cabinet section of the Ministry, which is the executing agency, and the concerned authorities of the Savannakhet Province, Department of Agriculture, and studied and confirmed the following:

- Signing of the minutes
- Background and details of the request
- Present condition of the study area
- Implementation and O/M Systems
- Suitability and effects of the project
- Prevailing physical and socio-economic conditions in the study area
- Agricultural conditions and maintenance of former projects of similar nature
- Relocation problems and effects of the construction of planned facilities on peoples' daily lives and the environment

- Technological studies required for the formulation of facility plan, design, and construction plan
- Procurement and cost of planned facilities and materials
- Capability of local constructors, possibility of locally hiring construction materials

The request for grant aid is based on the recommendation plans that is formulated in a master plan study and feasibility study for priority plans on the integrated Agricultural Rural Development Project in Savannakhet Province carried out by JICA from the end of year in 1990 to June 1992.

The plan recommended which is formulated in compliance with the National Economic Development Plan in the New Economic Mechanism (NEM) established in November 1986, aims to stabilize and expand agricultural production as the country's basic industry.

Savannakhet Province, a region rich in land and water resources, is compelled to practice single cropping due to unstable rainwater supply caused by insufficient irrigation facilities regardless of the leading rice production in the Lao P.D.R.

The request is aimed to promote agricultural development in Savannakhet Province and to stimulate the regional economy by stable agricultural production and expansion of harvest.

The main components of the request based on the results of the aforementioned feasibility study are;

- Construction of irrigation facilities in 2 areas in Savannakhet Province,
- Construction of an agricultural supporting center,
- Improvement of rural infrastructures, and supply of materials and equipment for operation and maintenance of the facilities.

This report contains the analysis and investigations on results which have been collected and confirmed throughout discussions and study in the Lao P.D.R.

List of the staff members of the Study Team, study schedule, member list of concerned authorities of the Lao P.D.R. and the Minutes of Discussion are attached at the end of this report.



## CHAPTER 2



## Chapter 2 BACKGROUND OF THE PROJECT

### 2.1 Background of the Project

#### 2.1.1 Outline

1) Laos is an inland country surrounded by Thailand, Myanmar, China, Vietnam, and Cambodia. Among the Asian countries, it is remarkably underdeveloped along with Myanmar, Bangladesh, and Nepal.

Laos gained independence from French colonization in 1953. However, the Lao People's Democratic Republic, which was led by the revolutionary party in December 1975, took more than 20 years to get established, what with the left, right and neutral parties constantly in strife with each other.

The economy of the Lao P.D.R. since the establishment of the present government was of a social structure. In November 1986, however, the revolutionary party decided on policy changes aiming for national economic development based on NEM, which entails a shift to market economy. With its special relationship with Vietnam and Cambodia, Laos politically fostered friendly relations with Socialist Republics, starting primarily with the Soviet Union. However, the economic open-door policy adopted in 1986 positively paved the way for improved relations with Western countries and international organizations.

2) Laos covers a total area of 236,800 square kilometers, with mountains exceeding 1,000 m in elevation dominating 80% of that territory. Administratively, the Lao P.D.R. is divided into Vientiane City and 16 Provinces, the latter further divided into 115 Districts, 937 Subdistricts, and 11,512 Villages. The total population of the country in 1990 was 4,170,000, with a population density of only 17.6 persons/square kilometer. There are 68 differing tribes in Laos and 50% reside in low lying areas, 30% in central Laos, 15% in the highlands, and the remaining 5% unknown. The recently-estimated population growth rate was 2.9%, and the population is more concentrated in the

agricultural area along Mekong River where one city and four provinces are situated.

The mean number of families is 6 per household. The population structure is young: 47% below 15 years of age, 47% 16 - 60 years of age, and 6% over 60 years old.

3) The land-use conditions in 1985 and 1988 are shown in Table 2-1. The Table indicates that only 4% of the total area of Laos is used for agricultural purposes. On the other hand, the cultivated area is 90% of the total agricultural area of 791,000 hectares. 85% of the population construct the rural population, while 15% make up the urban population.

Table 2-1 Land Use Conditions

(unit: 1000 ha)

Classification	1985*		1988**	
1.National land area	23,680	100%	23,680	100%
2.Agricultural area	800	3	901	4
3.Grassland	800	3	800	3
4.Thick forest	11,000	47	12,900	56
5.Sparse forest	5,000	21		
6.Housing area, roads	1,500	6	8,479	37
7.Lakes, rivers	2,180	9		
8.Others	2,400	10		

Source: \*1989, 2nd Five-Year Plan

\*\*FAO data

4) Land routes are the main means of transportation. However, out of a total of 11,900 km of national roads, only approximately 11% (1,300 km) are paved with concrete or asphalt; half of the remaining 10,600 km is paved in literate, while the other half is unpaved. The majority of the unpaved roads are not well maintained and quite impassable by large vehicles.

The shipping services in the Mekong river and its main tributaries are extremely important to the residents in terms of traffic and the transportation of agricultural produce. In summer, however, only the route from Vientiane to Luangphrabang is passable, while the remaining routes between cities are impassable due to the decrease in the Mekong's water level.

5) According to the UNDP report, the birth rate in 1988 was 4.6%, death rate 1.7%, infant death rate 11.7%, and the estimated mean life span was 50 years.

Further, it reports a ratio of 85% for 5 years of elementary education, 13% (1st and 2nd term) for 3 years of intermediate education, 9% for high school education and a literacy rate of 45%.

### 2.1.2 Economic Conditions

#### 1) Economic Policy

Since the establishment of the Lao P.D.R., administration was centralized, industries were nationalized, and a Farmer's Cooperative was organized as the "core" of the collective production system. However, the system failed to achieve the goal and was abolished.

Under these conditions, the Revolutionary Party formulated the New Economic Mechanism (NEM) during the 4th convention held in November 1986, to reconstruct the nation's economy.

#### 2) National Development Plans

The 1st 5 year plan (1981-85) aimed for increased rice production and self-sufficiency in food production. Through increased exportation of energy resulting from the expansion of the Nam Ngum Dam power plant and smooth agricultural production growth, the implementation of the project became economically feasible and the objectives were almost fully attained.

In contrast, however, only half of the objectives set for the 2nd 5 year plan (1986-1990) were achieved due to a largely reduced rice production brought about by two successive years of heavy drought, decrease in electrical power, and bankruptcy of government enterprises.

The 3rd 5 year plan (1991-1995) is presently being implemented. Agriculture, the main national industry, largely depends on weather conditions and hence is subject to unstable production.

### 3) Industrial Structure and Production Output

As previously mentioned, Laos is an agricultural country, and agriculture covers approximately 60% of the GDP and 72% of the population. Therefore, slumps in agricultural production strongly affects national economy.

A GDP breakdown by industry ranks agriculture at the top, followed by service-oriented industries, and then the mining and manufacturing industries.

### 4) Trade and Balance of International Payment

The 1990 balance of trade was in the red at US\$ 166,500,000 with US\$ 71,600,000 for export and US\$ 238,100,000 for import.

The main items for export are lumber, electricity, and coffee, and their rates in the recent export volume are 37%, 30%, and 8%, respectively; a total of 75%. Since 1991, the apparel industry has become the leading export industry of the nation.

The main items imported by Laos are fuel, machinery, daily sundries, and raw materials. The economy's dependence on imports compels the balance of trade to be constantly in the red.

Laos's exports to Western countries totaled 75%, the rest covers exports to Eastern Europe. Imports from the Soviet Union and Eastern Europe totaled more than 60%, but those from Western countries rose to 50% in 1989.

### 5) Exchange Rate and Prices

The 1987 exchange rate of 350 kips to a dollar doubled to 700 kips by the end of 1989. No large fluctuations have taken place since then, however, and the rate has been stabilized at 710-720 kips to the dollar.

The increase in the price of rice was almost equivalent to the decrease in the value of the Kip in ratio. However, vegetable prices went down to 10-20%, while sugar and meat prices escalated to 60%.

As for wage earners, the unskilled sector is paid US\$ 3.0 per day, while the skilled sector gets about US\$ 10 dollars per day.

The average monthly pay of salary earners, on the other hand, is about 30-45 US dollars.

#### 6) Financial Balance and Foreign Assistance

The national budget for 1990 was 65.9 billion kips and 66.1 billion was intended for investments. The budget, however, exceeds the actual income of only 64.1 billion kips.

The budgets of the central government from 1988-1990 shown in Table 2-2 indicate constant financial deficits.

Table 2-2 Central Government Budget

	(unit: 1 million kips)		
	1988	1989	1990
Expenditures	75,043	106,391	131,957
Current expenditures	28,038	39,936	65,877
Wage, salary	11,250	19,590	35,800
Resources	15,485	15,339	23,717
Annuity	250	2,530	3,000
Liabilities	1,053	2,477	3,360
Capital outflow	47,006	66,455	66,080
Income and grants	33,836	41,662	64,054
Total income	28,531	35,557	58,244
Revenues	21,474	27,421	44,270
Others	7,054	8,135	13,975
Grants	5,305	6,106	5,810
Financial balance	-(41,208)	-(39,148)	-(49,647)

(Source: Government Data)

Table 2-3 shows the assistance received from leading foreign countries (DAC); in 1990, both Japanese and foreign ODA's granted Lao US\$ 51,180,000 and US\$ 100,480,000 respectively.

Table 2-3 Details of Aid from Leading Countries  
(Based on 1990 Expenditures: unit - 1 million US\$)

	Japan	Sweden	Australia	France	Others
Amount	17.36	17.08	5.98	3.99	6.77
Percentage	33.9	33.4	11.7	7.8	13.2

(Source: OECD)

## 7) Agricultural Taxation and Land Ownership System

### <1> Agricultural Taxation

Newly cultivated areas are exempt from taxes in the first 3 and 5 years, while lumber, according to kind, is taxed 5 - 45% of its market price.

In the 3rd Five-year plan, tax rates will be determined according to the latent productivity of lands by classification, in accordance with the actual conditions in Laos, instead of present productivity.

Government enterprises are accountable for 82% of the revenues, while agricultural taxes and tax revenues account for 2% and 20%, respectively.

### <2> Land Ownership System

Land ownership rights are nominally reverted to the government, but in areas practicing intensive cultivation, ownership rights are clearly designated. However, in the mountainous districts where slash and burn cultivation is practiced, semi-nomadic practices prevail and ownership rights are quite lax.



## 8) Relationship with Japan

To promote bilateral relations with Laos, the government of Japan established its embassy in Laos in 1955. The Embassy of Laos was established in Japan in 1956. In 1989, the Prime Minister of the Lao P.D.R. visited Japan, while in 1990, Japan's Foreign Affairs Minister, Nakayama, visited Laos. Further, in 1992, the Chairman of the Supreme Peoples Congress visited Japan, and Japan's National Land Agency's Director, General Higashiya, and the Under-secretary of Foreign Affairs, Kakizawa, visited Laos in 1992 and 1993, respectively. Other important people also participated in maintaining the friendly bilateral relations of both countries.

Japan's exports to Laos in 1990 totaled US\$19,600,000, while its imports totaled US\$4,600,000. The items mainly exported by Japan were automobiles, iron and steel, and machinery. On the other hand, the main item imported by Japan from Laos is lumber.

Table 2-4 1990 Trade Amounts with Japan

(unit: million US\$)

	Imports from Japan	Exports to Japan
1985	11.7	1.3
1986	12.9	1.4
1987	15.4	1.5
1988	19.7	7.0
1989	24.5	8.0
1990	19.6	4.6

Source: Japanese Customs Statistics

### 2.1.3 Agricultural Production

Agriculture is the basic industry of the Lao P.D.R., contributing approximately 60% of the GDP and covering more than 72% of the population.

Table 2-5 and 2-6 show the estimated area allocated for the cultivation of each crop and their production estimate.

Table 2-5 Areas allocated for Rice Production

(ha)

	1985	1986	1987	1988	1989	1990
Total area for rice production	8,893,700	8,482,600	6,243,800	6,631,500	6,975,200	6,687,800
Paddy Fields	6,374,000	6,364,000	5,000,000	4,574,000	5,196,000	5,012,800
Irrigation	136,000	118,600	114,800	172,500	114,200	120,000
Slash and burn cultivation	2,383,700	2,000,000	1,129,000	1,885,000	1,665,000	1,555,000

Table 2-6 Production by Major Agricultural Crops

(1,000 t)

	1985	1986	1987	1988	1989	1990
Total rice production	1,428.5	1,449.2	1,207.2	1,003.4	1,404.1	1,429.9
paddy field	1,019.9	1,081.9	950.6	686.1	1,039.2	1,052.7
irrigation	27.2	27.3	28.7	34.5	32.0	35.1
slash and burn cultivation	381.4	340.0	225.9	282.8	332.9	342.1
Vegetables	45.6	53.9	30.3	68.5	65.7	53.9
Maize	35.9	41.5	35.7	50.8	43.9	50.3
Rootcrops	100.0	122.5	4.0	187.2	159.9	172.3
Peanuts	9.5	11.3	5.6	4.5	5.9	5.9
Sugarcane	83.1	112.0	112.9	107.1	126.0	112.9

Source : World Bank

Paddy is mostly cultivated in 4 districts and one city, namely Vientiane city and Vientiane, Savannakhet, Sarawan, and Champasak. Their combined production totals 57% of the amount of rice produced nationwide.

Cultivation of rice in the rainy season is practiced in the south and the area allotted to this practice is 396,476 ha (1990), 50% of the country's total area for cultivation. The metropolis, on the other hand, devotes 63% of its 11,392 ha of cultivable land to dry season paddy cultivation, while 74% of the 260,178 ha of cultivable land in the northern area is devoted to upland paddy cultivation. In view of these practices, the regional maldistribution of every rice cultivation period can be clearly observed.

This maldistribution is particularly significant in the metropolis, which covers only 10% of the national land territory, but devotes 63% of its area to dry season rice cultivation, a practice that may be attributed to the concentration of agricultural and irrigation development projects to date in the metropolis, thus resulting in an ever widening regional gap.

The rice production yield of Laos is gradually increasing, albeit in the absence of any marked changes in area these past several years. This is attributed to the prohibition of slash and burn cultivation and the fact that the development of rainy season paddy cultivation has reached its limits, peak situations that have been attained even when rapid expansion was not desired. Further, it is also possible to consider an increase in production along with improvements in productivity brought about by the widespread use of new varieties, technological guidance, and gradual increase in investments for chemical fertilizers.

The following should be urgently undertaken:

- Do away with rain-paddy cultivation and stabilize production by developing water resources to provide supplementary irrigation for rainy-season cultivation.
- Establish fixed cultivation during the rainy and dry seasons; use at least one of these cultivation practices for commercial crop production and establish an agricultural system for a market economy.

- Improve farmer's income and economic standing, and stabilize farm management through the expansive production of commercial crops.

Agricultural development in this country is hindered largely by bad roads and transportation conditions, hence these rural conditions need to be improved upon the implementation of irrigation development projects. Moreover, it is necessary to implement an integrated development project which involves a marketing system for surplus agricultural produce due to increase in yield and production brought about by the introduction of irrigation and diffused guidance in modern farming techniques.

#### 2.1.4 Livestock

Livestock farming is also an important source of nutrition and income, and their exportation contributes much to the national economy.

The contribution of the livestock industry (including the fisheries industry) to the GDP totaled 8.3% in 1989. The main agricultural products were meat, cow hide, and poultry.

The livestock production, especially cattle, goats, and sheep has doubled over the past 10 years.

Countermeasures to the spread of contagious diseases are extremely important, and the government took this importance into account in the 3rd Five-Year Plan by reinforced measures for the prevention of epidemics.

#### 2.1.5 Forestry

Forestry is one of Laos's main industries, and approximately 80% of the national territory is mountainous and abundant with forest resources. Forestry constituted 9.3% of the 1989 GDP. Lumber, as an important export, contributed 33.8% to the overall export amount. It brought in US\$ 21,400,000 in 1989.

However, forest areas have decreased due to rapid development, as follows:

1940 - 17,000,000 ha of forests - 70% of the national territory  
1963 - 15,000,000 ha - 63%

1973 - 12,700,000 ha - 54%  
1981 - 11,200,000 ha - 47%

It is important to foster a suitable afforestation policy and to shift in the near future to a higher leveled lumber industry that goes beyond simple felling of timber.

With due consideration to the above conditions, the Laotian government proposed the following for the conservation and development of forest resources:

- <1> To eliminate uncontrolled felling of trees and slash and burn practices.
- <2> To increase the forest area, which has decreased to less than 47%, to 70% of the country's total land area.

#### 2.1.6 Fisheries

Marine resources, are widely distributed nationwide and have always been the locals' source of protein. The yearly fish catch amounts to approximately 30,000 tons of which 25,000 are from rivers, 3,500 from lakes and swamps, and the remaining more-or-less 1,500 tons are bred.

The annual consumption per person is estimated at 7 - 9 kg, and it is only approximately 1/3 or 2/5 of the consumption of Vietnam and Thailand. The catch in rivers is gradually decreasing, and because of this, the government plans to set the consumption amount per person to half (11 kg) of Thailand's and proposes to cover the shortage by fish breeding.

## 2.2 Outline of the Request

### 2.2.1 Priority of the Request

Rainfed paddy cultivation yields 75% of Laos's rice production. However, since it is largely influenced by weather conditions, particularly rainfall conditions, production is extremely unstable.

Since improvements of rainfed paddy and expansion of cropping area have presently reached their limits, increase in rainy season paddy cultivation can only be realized by establishing infrastructures that would insulate production from meteorological vagaries.

Accordingly, through this project, an irrigation system will be developed and an irrigation development plan that aims at an effective and stable supply of water and a stable yield will be accelerated.

Along with accelerating the improvement of the agricultural support system, the diffusion of appropriate technological guidance and popularization of new varieties will be systematically carried out, and through crop diversification and expanded cropping, a new agricultural structure on line with a market economy will be promoted.

For the citizens who are only familiar with the sales of surplus rice produced in the backyard through the help of middlemen, guidance and extension activities on irrigation techniques and also in the sales and marketing aspect would be required to make them understand the principles of a free market economy and to teach them skills in free sales practices.

Further, irrigation development will be more effective through the improvement of agricultural infrastructures.

In consideration of the government's basic policy, the construction of an Agricultural Supporting Center will be essentially important to direct irrigation development works, the improvement of agricultural infrastructures, and to act as the central figure in the extension of support and guidance to the farming community.

Conclusively, this request can be considered as one of the plans for the implementation of projects, starting with the Five-Year plan, which are given priority.

## 2.2.2 Background and Scope of the Request

### (1) Background of the Request

The decline in rice production by consecutive heavy drought in 1987 and in 1988 brought a large blow to the economy of Laos. Accordingly, the Government of Laos established the following measures;

- Increase and stability in paddy field production and self-sufficiency production.
- Promotion of market economy and improvement of agricultural structures.
- Introduction of modern agricultural technology.
- Shift from self-sufficient farming to commercial crop production.
- Establishment of market system for stable acquisition of farmer's benefits.

In order to achieve an ideal type of agricultural social, the Government aimed at introduction of modern technology not only for increasing agricultural production, but also for improvement of living conditions of farmers and of market systems. In addition, implementation of an development project including construction of various facilities necessary for establishment of commercial crop production has been planned. Then, the Government decided to execute a basic study on the integrated agricultural rural development in Savannakhet Province, a poor-production region left behind in development.

In the beginning of 1990, the Government requested technical assistance from Japan for execution of a master plan study and a feasibility study on a priority plan for the above project.

In response, JICA conducted the master plan study and the feasibility study of the priority plan for Savannakhet Agricultural Rural Development for a year and a half, from the end of 1990 until June 1992.

After the completion of the above studies and based on the results, grant aid was requested by the Government of the Lao P.D.R. for the implementation of the project.

## (2) Details of the Request

### 1) Requested Plan

- <1> Construction of irrigation facilities in two areas in Savannakhet Province, namely H. Bak upstream and Namphou.
- <2> Construction of Agricultural Supporting Centers.
- <3> Improvement of rural roads and infrastructures

These three items above are the major components of the integrated agricultural development plan.

To attain the objectives previously mentioned, it is important to consider agricultural production increase, guarantee the construction of facilities important to the improvement of the farmers' living conditions, farm management, and marketing system, and to consider the diffusion and expansion of modern farming techniques and the production of commercial crops in the entire Savannakhet area.



## 2.3 Outline of The Project Area

### 2.3.1 Location of the Project Area and Socioeconomic Conditions

#### (1) Location

The main Project Area is approximately located between 16°10' and 16°32' of north latitude and between 105°01' and 105°14' of east longitude, and about 35 km southeast from Savannakhet. It covers a total area of about 26.25 km<sup>2</sup>.

H. Bak area is a paddy field area situated 6 km north and 8 km east from B. Lak 35, at the intersection of Route No. 13 and 11. The H. Bak dam water resource facilities are located approximately 6 km north and 14 km east of B. Lak 35, upstream of the paddy field area of Nonnadi village.

Namphou area is situated 6 to 14 km south of B. Lak 35, and comprises paddy fields extending on both sides of the H. Xay (river). Water resource and intake facilities are distributed in 6 different places in the area.

The agricultural supporting center is projected to be built approximately 700 m east from B. Lak 35 along Route No. 13, which roughly corresponds to the center between the two areas of the Project.

B. Lak 35 is the cross point of Route Nos. 13 and 11, the main traffic and transportation arteries of the country. It is located about 35 km west of Savannakhet City on Route No. 11, and is advantaged socio-economically and geographically, expecting further growth after being developed.

#### (2) Land Use Conditions

##### 1) Land Use Conditions

Areas elevated from 140 - 170 m are under cultivation. Paddy cultivation is undertaken in shallow areas of reservoirs and ponds by water reduction methods. Cultivation in rainfed paddy fields located on lowlands and at the heads of valleys having

spring waters, is made possible through small-scale pump irrigation.

Only a few of the areas are subject to slash and burn cultivation, and they are only utilized within a period of 4 years. Orchards are cultivated with coconuts, langan, banana, etc.

Natural forests of broadleaf trees can be found in the highlands surrounding the rainfed paddy fields and their average estimated productivity is 50 m<sup>3</sup>/ha. However, the largest and productive forest area annually decreases and now represents only 35 to 40% of the total forest area.

The land use condition by districts is shown in Table 2-7 below.

Table 2-7 Land Use Conditions (1990)

(ha)

	Khanthabouly District	Champhone District
Rainfed Paddy Fields (incl. irrigated paddy fields in rainy season)	10,129	15,074
Irrigated Paddy Fields (dry season)	132	639
Burnt Fields	13	-
Paddy Area	10,274 (10.0%)	15,713 (19.9%)
Fields	545	241
Total Agricultural Lands	10,619 (10.3%)	15,954 (20.2%)
Mountain Forests and Others	83,181	63,046
TOTAL	103,000	79,000

Source: Agricultural Statistics of Savannakhet Province  
(Ratio of the total area is indicated between  
parentheses.)

### (3) Socioeconomic Conditions

#### 1) Administration and Population

The Lao PDR jurisdiction is administratively divided into Provinces, Districts, Subdistricts and Villages.

Savannakhet Province comprises 12 districts, 143 subdistricts and 1,606 villages. As for the Project Area, H. Bak area is connected with 14 of the 159 villages of Champhone District, while Namphou area is connected with 9 of the 127 villages of Khanthabouly District.

Population distribution in Savannakhet Province is shown in Table 2-8 below.

Table 2-8 Population in the Savannakhet Province

Districts	1986	1987	1988	1989	1990	1991	1992
Saybouly	-	33,423	34,292	36,028	37,632	38,667	39,845
Outhoum- phone	82,085	50,728	52,047	53,452	59,153	60,839	62,634
Khantha- bouly	100,814	103,023	106,143	109,327	113,502	116,793	120,181
Champhone	79,467	81,079	83,078	84,449	85,383	83,702	86,171
Sonbouly	28,066	28,773	29,492	30,912	31,753	32,594	33,621
Songhone	66,742	69,931	70,754	72,664	72,657	74,727	76,972
Atsaphang- thong	72,836	74,842	76,522	78,588	82,047	84,385	86,875
Others	127,191	130,332	133,081	126,532	129,334	132,089	136,940
Total	557,201	571,131	585,409	591,952	611,461	623,796	643,199

Source: Savannakhet Province Data

The population of the Khanthabouly and Champhone Districts included in the Project Area represents respectively 18.7% and 13.4% of the province population. Considering that the population

density in Savannakhet Province is 29 people per km<sup>2</sup> and that population density in the above mentioned districts is respectively 113 p/km<sup>2</sup> and 106 p/km<sup>2</sup>, these areas are comparatively overpopulated.

The population of the villages that will benefit from the irrigation project is shown in Table 2-9 below. H. Bak area population is about 8.3% of the Champhone district population, that is 7,049, and the Namphou area population is approximately 5.7% of 6,480 the population of Khanthabouly district.

Table 2-9 Population in the Project Area

H. Bak Area

Villages	B.Xiandam	B.Nonghong	Sithong	Kho	Nongveng
Population	532	457	560	712	392
Villages	Dongdokmai	Vatthana	Phailon	Phonthan	Nanokkhan
Population	515	650	317	225	455
Villages	Dongkhankhou	Nonkhalong	Gnansoung	Dongkhamkhen	Total
Population	913	640	479	426	7,049

Source: Savannakhet Province Statistics

Namphou Area

Villages	Mouangk-Nua	Mouanghai-Tai	Dontoun	Dogkouakham	
Population	965	1,316	616	1,151	
Villages	Namphou-Nua	Namphou-Tai	Dongphosi	Phoxai	Total
Population	630	568	740	267	6,480

Source: Savannakhet Province Statistics

The agricultural (including forestry and livestock industries) population in Savannakhet Province is 556,645, approximately 91% of the provincial 1990 population of 611,461.

Table 2-10 Structure of Agricultural Population

H.Bak Area	1990	1991	1992
Total Population	6,406	6,480	6,572
Agric. Population	5,523	5,549	6,083
Ratio (%)	86.22	85.63	92.56

Namphou Area	1990	1991	1992
Total Population	7,198	7,273	7,298
Agric. Population	5,990	6,667	6,939
Ratio (%)	83.22	91.67	95.08

Source: District Agricultural Department (1992)

## 2) Industry

Table 2-11 shows about 91% of the population of Savannakhet Province belongs to agriculture. The economy of the Province is self-reliant in agriculture which covers 85% of the GDP (1990).

Table 2-12 shows the harvested area, production and unit yield of the main crops.

Although the total area of cultivated paddy has been decreasing in recent years, the harvest volume has been increasing. 80% of the cultivated area is paddy, 15% upland rice and 5% maize and other crops.

98% of the paddy rice is cultivated under rainfed conditions during the rainy season. Rice planting is carried out in May and June at the onset of the rainy season. Then, after a one-month rice seedling period, the seeds are transplanted. Paddy rice is harvested between October and December, at the end of the rainy season.

Table 2-11 Gross Domestic Product of the Savannakhet Province

(Kip)

Sector/Year	1990	1991	1992
<b>AGRICULTURE SECTOR</b>			
- Agriculture	25,360,170	34,270,500	36,078,300
- Cattlebreeding	36,437,792	36,882,640	46,103,300
- Forestry	2,401,042	2,657,808	2,835,063
Sub-total	64,199,004	73,810,948	85,016,663
<b>INDUSTRY SECTOR</b>			
- Salt Manufacture	13,957	13,240	13,500
- Minerals	2,256,274	2,136,274	2,000,000
- Electricity	270,454	280,000	350,000
- Construction	1,708,989	1,888,732	2,100,896
Sub-total	4,249,674	4,318,246	4,464,396
<b>SERVICES</b>			
- Commerce			
- Hotels	5,215,135	5,778,360	6,378,015
- Transportation	659,277	663,710	635,815
- Others	5,839	6,586	7,832
Sub-total	1,172,575	1,192,590	2,415,638
<b>TOTAL</b>	7,052,826	7,641,246	9,437,300
	75,501,504	85,770,440	98,918,359

Source: Provincial Department of Trade and Economy, 1992 Records

Table 2-12 Harvested Area, Production per ha and Total Production

Crops/Year	1976	1980	1986	1987	1988	1989	1990
<b>RAINY SEASON</b>							
<b>PADDY</b>							
1) Harvested Area (ha)	60,261	94,800	80,883	83,399	80,123	82,458	75,635
2) Total Production (t)	91,114	161,160	218,384	217,707	80,550	233,638	210,265
3) Production (t/ha)	1.51	2,000	1,087	1,482	830	1,300	1,281
<b>DRY SEASON</b>							
<b>PADDY 1)</b>	638	1,300	3,296	4,419	2,133	4,169	3,753
2)	716	0.65	3.03	2.98	2.57	3.21	2.93
3)	1.12	18,639	9,705	9,002	8,800	7,725	5,866
<b>UPLAND PADDY</b>							
1)	10,723	13,047	12,617	11,486	11,333	9,806	8,556
2)	9,221	0.70	1.3	1.28	1.28	1.27	1.46
3)	0.86	113,439	90,588	92,401	89,003	90,183	81,495
<b>TOTAL</b>		175,507	234,297	233,612	94,016	247,613	222,574
<b>RICE CROP 1)</b>	70,984	1.55	2.59	2.53	1.06	2.75	2.73
2)	101,051						
3)	1.42	5,900	983	426	1,238	804	3,435
<b>MAIZE</b>		5,900	983	1,350	2,524	1,220	5,840
1)	2,867	1.0	1.0	3.17	1.96	1.52	1.70
2)	3,403						
3)	1.19	1,370	983	1,300	1,300	466	1,080
<b>SWEET POTATO</b>		12,020	8,352	11,700	12,285	3,758	16,840
1)	345	8.77	8.5	9.0	9.45	8.06	15.59
2)	2,901						
3)	8.41	300	85	120	180	347	350
<b>MUNGO BEANS</b>		150	51	120	279	449	315
1)	71	0.5	0.6	1.0	1.55	1.29	0.90
2)	44						
3)	0.6	1,880	668	470	910	445	500
<b>PEANUTS</b>		1,504	549	904	711	478	550
1)	522	0.8	0.82	1.92	0.79	1.07	1.10
2)	401						
3)	0.77	250	259	290	680	644	650
<b>TOBACCO</b>		1,155	155	300	3,053	2,576	2,925
1)	91	4.62	0.6	1.03	4.49	4.0	4.50
2)	413						
3)	4.54	2,400	700	610	1,040	717	750
<b>COTTON</b>		1,920	420	540	670	789	480
1)	2,000	0.8	0.6	0.89	0.64	1.10	0.64
2)	1,450						
3)	0.73	985	550	600	665	1,400	670
<b>VEGETABLES</b>		7,390	3,300	3,600	5,605	12,600	5,628
1)	400	7.5	6.0	6.0	8.43	9.0	8.40
2)	3,152						
3)	6.43	92	112	496	500	346	150
<b>SUGARCANE</b>		2,469	3,360	10,840	14,000	12,884	3,000
1)	80	26.84	30.00	21.85	28.0	37.24	20.0
2)	1,976						
3)	24.70						

Source: Agriculture Statistics (Departments of Economy, Planning, Finance and Cooperation, 1991)

The cultivated land area per household and the production/ha are shown in Table 2-13.

Table 2-13 Present Conditions of Rice Cultivation in the Project Area

	H. Bak Upstream Area	Namphou Area	Total
Number of Household	1,325	1,179	2,504
Total Paddy Field Area (ha)	1,589.25	1,138.03	2,727.28
Paddy Field Area/Household (ha)	1.21	0.96	1.09
Total Paddy Area with Upland Crop Fields (ha)	1,603.75	1,295.51	2,899.26
Cultivated Area/Household (ha)	1.22	1.10	1.16
Rice Production (t)	3,054.47	1,461.79	4,516.26
Unit yield (t/ha)	1.92	1.28	1.66

Source: Survey on Rural Conditions (1990)

Paddy rice production is mainly for self-consumption. As shown on the Table below which presents the relationship between supply and demand in rice in the Project Area, a surplus of 669 tons was produced in the H. Bak Area, while the Namphou Area suffered a shortage of 764 tons.

	H. Bak Upstream Area	Namphou Area	Total
Population	7,049	6,480	13,529
Rice producers:			
Irrigated paddy (t)	3,054	1,462	4,516
Upland paddy (t)	96	32	128
Village self-consumption (incl. rice seed)	2,326	2,138	4,464
Taxes	155	120	275
Surplus & shortage	669	-764	-95

Source: Survey on Rural Conditions (1990)



According to the agroeconomic survey conducted during the Master Plan Study, about 57% of the farmers' income is rice for self-consumption. Cash revenue is obtained from sales of domestic livestock, such as pigs, cows and poultry.

Present agroeconomic situation of farmers is presented in Table 2-14.

Table 2-14 Present Economic Conditions of Farmers in the Study Area

Unit: %

	H.Bak Upstream Area	Namphou Area	Total
INCOME	100	100	100
Crops	57.6	56.6	57.0
Paddy rice	53.3	53.9	53.6
Others	4.3	2.7	3.4
Livestock	22.9	21.3	22.0
Buffalo, cow	11.1	14.5	13.0
Pork	7.8	3.4	5.4
Poultry	4.0	3.4	3.6
Wages, Labor	6.3	15.6	11.5
Handicraft	5.1	1.0	2.8
Remittance, others	8.0	5.5	6.7
EXPENDITURE	100	100	100
Production Cost	14.7	6.7	9.6
Fertilizers, chemicals	12.1	3.8	6.8
Wages, others	2.6	2.9	2.8
Rice for self-consumption	50.7	36.3	41.5
Medical care	9.9	15.0	13.1
Education	4.9	5.4	5.2
Social expenses	3.5	4.9	4.4
Daily necessities and others	16.3	31.7	26.2

Source: Data on the Study on Farmers' Actual Economic Conditions

According to Table 2-11, livestock represents about 54% of the agricultural production, which is 86% of the provincial GDP.

Livestock production (poultry, pigs, cattle, sheep) in Savannakhet Province is shown in Table 2-15. 25,000 head of cattle and buffalo are consumed every year, while 10,500 are exported to Thailand. Export prices of livestock are as follows:

- Buffalo            160,000 to 240,000 kips (225 to 335 US\$/head)
- Cattle            140,000 to 180,000 kips (195 to 250 US\$/head)
- Pig                300 to 700 kips/kg (0.42 to 1.0 US\$/kg)
- Poultry           800 to 1,800 Kips (1.15 to 2.5 US\$ apiece)

Table 2-15      Main Livestock Production

Crops/Year	1976	1980	1986	1987	1988	1989	1990
Buffaloes (hd.)	124,500	221,823	204,863	209,895	215,681	178,471	208,420
Cattle (hd.)	106,400	175,302	201,013	213,220	212,525	205,661	231,086
Pigs (hd.)	108,300	147,969	139,111	142,867	165,843	106,354	124,160
Sheeps & goats (hd.)	450	818	6,246	4,822	7,480	15,213	16,190
Poultry (x1000 birds)	435.1	633.0	692.5	884.1	955.1	47.1	446.2

Source: Government Statistics

Forestry, like paddy production and livestock, is an important industry. In 1981, 14% (1,598,000 ha) of the national territory and 7.2% of the Province area were forests. In 1990, the forest area was 1,500,000 ha and productivity of forests was 70 to 100 m<sup>3</sup>/ha, while dispersed forest productivity was 50 m<sup>3</sup>/ha. In recent years, the felling average has reached 50,000 to 60,000 m<sup>3</sup> per year, 90% of which is exported to Thailand.

## 2.3.2 Natural Conditions

### (1) Topography, Geology, Soil, and Vegetation

#### 1) Topography and Geology

The highest part of the Project Area is about 200 m in elevation. The H. Bak Upstream Area ranges between 160 and 140 m with gentle slopes and undulations from the northwest to southeast. On the other hand, the Namphou Area elevation ranges from 170 to 140 m, sloping from the north at a gradient ranging from 1/100 to 1/150.

The Project Area is widely extended and consists of eroded slopes and plateaus over 160 m in elevation where woodlands, wastelands and rainfed paddy fields can be found, and alluvial lands of about 140 - 160 m in elevation at the bottom of valleys where low lying rainfed paddy fields are found.

The Project Area geology is mesozoic. The parent rocks are mainly composed of sandstone, but mainly of shale in some places. These parent rocks are covered by soil from several to 10 meters thick. These layers partially include gravel layers of laterite or hard pans.

#### 2) Soils

The soil classification of the Project Area was made in conformity with the "Soil Map of the World" by FAO and UNESCO, and the soils were classified into 4 groups. The area by soil type is shown in Table 3-9.

##### <1> Acrisols

Acrisols extend broadly in the Project Area on alluvial deposits and are made of basic siliceous materials. The clay of the top soil is not settled and accumulates in the subsoils. Although this soil type is where rainfed paddy fields are constructed, the yield of these fields is average.

##### <2> Fluvisols

Fluvisols are located in the southwest boundary of H. Bak and are distributed in depression zones of hard pans. The soils are primarily made from recent alluvium deposits. These are clayey soils that are brownish black in color and humus in quality.

Soil layers are shallow, with bare rocks found in some places. The area is mainly made up of rainfed paddy fields, wastelands and woods. Crop cultivation and vegetation conditions are not favorable.

### <3> Gleysols

Gleysols develop over depressions along the rivers. The soils are primarily made from recent alluvium deposits. The layers are excellent soils deeply distributed with high content of clay and nutrients. This area is cultivated with rainfed paddy fields and is suitable for crops; sometimes, however, it gets inundated for a short period.

### <4> Cambisols

Cambisols are distributed in an area of more than 160 m in elevation. Layers are deeply located, however some areas are shallow with rock outcrops. The soil texture is sandy loam and the structure is very friable with low phosphorous content and poor fertility. The area is made up of rainfed paddy fields, wasteland, woodland and villages, but is not very suitable for paddy cultivation.

Areas by soil type in the Project Area are shown hereafter.

Table 2-16 Areas by Soil Type

Unit: ha

Soil Type	H. Bak Area	Namphou Area	Total
Gleysols	307	252	559
Acrisols	470	489	959
Cambisols	569	220	789
Gluvisols	236	-	236
Total	1,582	961	2,543

Source: Soil Classification in the Feasibility Study

### 3) Vegetation

The vegetation in the Project Area can be classified as follows:

<1> Forests made up of tropical broadleaved trees located on highlands with an elevation of more than 140 to 180 m. The major

tree species are the Dipterocarpaceae, giant trees forming sparse woods with bush (*Strychnos* spp., *Randia* spp.) and herbaceous stratum.

<2> Bush comprised of various kinds of trees, bamboos and herbaceous plants adjacent to cultivated fields.

<3> Swamps and wet grasslands in areas next to the cultivated lands. These are covered with gramineous weeds, reeds, and water oats.

## (2) Hydrology and Meteorology

The Project Area has a tropical climate dominated by the southwest monsoon. The monsoon, carrying moisture from the Indian Ocean, brings heavy rainfall between mid-May and mid-October. The northeast monsoon between November and February brings cool air from China.

The mean annual rainfall is 1,400 mm at Savannakhet and 1,700 mm at Xeno. The monthly temperature fluctuates between 21°C and 30°C, and the average annual temperature is 26°C.

Average monthly weather conditions for 23 years (1967-1989) is as follows:

Table 2-17 Average Monthly Weather Conditions

	JAN	FEB	MAR	APR	MAY	JUN	JUL
<u>Savannakhet Station</u>							
Mean							
Temperature(°C) Mean							
Humidity (%)	21.6	25.1	27.6	29.5	29.1	28.2	28.4
Evaporation (mm)							
Rainfall (mm)	67	68	64	67	74	79	79
Rainy days	3.3	4.0	4.7	5.0	4.7	4.1	3.9
	2.0	9.4	33.4	182.4	148.0	266.0	212.8
Rainfall in Xeno (mm)	0	1	2	6	13	16	14
	1.5	17.1	37.1	13.7	221.9	311.1	312.1
	AUG	SEP	OCT	NOV	DEC	ANNUAL	
<u>Savannakhet Station</u>							
Mean							
Temperature(°C) Mean							
Humidity (%)	27.7	27.5	26.4	23.9	20.9	26.3	
Evaporation (mm)	82	78	75	71	68	73	
Rainfall (mm)	3.8	3.7	3.8	3.6	3.0	3.8	
Rainy days	309.6	228.5	87.9	3.7	0.6	1384	
	19	18	7	2	0	98	
Rainfall in Xeno (mm)							
	370.4	271.6	92.0	3.5	1.3	1713	

Source: Observation Data of the Savannakhet Meteorological Station

The main rivers in the Project Area are H. Bak river in H. Bak area and H. Xay, H. Phou, H. Pangha and H. Somhong rivers in Namphou area.

H. Bak river is a tributary of the Champhone river, a large tributary of the Xe Banghiang river. The Xe Banghiang basin has a catchment area of 19,600 km<sup>2</sup>. All the rivers in the Namphou area join the H. Chan river which flows into the Mekong river.

The backwater influence of the Mekong river can reach an elevation of 130 to 135 m as opposed to the rivers in the Project Area where the

lowest river bed elevation is more than 140 meters and have no backwater effects.

The flow of these rivers from the headstream remarkably decreases during the dry season and it is said that sometimes these rivers dry up. However, it is not possible to confirm such information since there are no valid observation data on river discharge.

### 2.3.3 Social Infrastructures

#### (1) Road and Transportation

1) The Project Area is crossed by route No. 13, the main trunk road that runs across the country from north to south; by route No. 9 and route No. 11 that cross route No. 1 and runs from east to west; then by branch roads and other local roads of different classes.

#### National Road Background

##### <1> Route No. 13

Route No.13 is the main road that crosses the country from the city of Luangphrabang in the north, passes through Vientiane City, and runs south parallel to the Mekong river. It passes through Xeno City, B. Lak 35, then turns south, passes Champasak and goes to Cambodia. In the Project Area, route No. 13 crosses route No. 9 connecting Savannakhet with Danang (Vietnam) at Xeno, and route No. 11 at B. Lak 35. Road improvement projects in the Project Area are in progress. The roads are paved in literate except in the Xeno urban area where the road surface is paved with asphalt.

##### <2> Route No. 9

This route connects Savannakhet with Danang (Vietnam) and with Thailand (crossing the Mekong River by ferry) at Savannakhet or Keng Kabao. Route No. 9 crosses route No. 13 at Xeno, branching here into route 9-B going to Keng Kabao.

##### <3> Route No. 11

From Savannakhet, route No. 11 passes B. Lak 35, Kengkok and B. Lahanam.

The road between Kengkok and B. Lahanam is impassable during the rainy season.

Roads structured to cope with all weather conditions are only those in the urban areas and their environs. The rest are mostly paved in literate.

Maintenance of the main roads is carried out during the dry season. However, the literate pavement is destroyed by rainfall in the second half and at the end of the rainy season, making driving very difficult in some places. Besides, a lot of the bridges have a proof load of 15 tons or 21 tons.

Since the functionality and maintenance of the roads are not satisfactory, 80% of the rural roads are not passable for vehicles during the rainy season. Further, delay in bridge construction or repair makes passage by vehicle or ox cart difficult.

## 2) Transportation

The state public transportation enterprise in Savannakhet Province is under the supervision of the provincial Department of Communication, Transportation, Post and Construction (DCTPC), and are managed by an independent management system. The enterprise covers not only Savannakhet Province but also Vientiane, Pakse and the Vietnam routes. The enterprise has 28 buses (70 passengers). Besides, there are private bus transportation companies owning 15 buses which particularly run services between villages which are not covered by the state public transportation enterprise.

Moreover, water transportation using the Mekong river has increased traffic to Thailand, the number of Thai travelers and the traffic of goods in recent years, and has enabled the transportation of goods from Vietnam to the Vientiane Metropolis.

## 3) Airport

### <1> Air Services in the South of Laos

Along with the recent improvements in the Laotian economy, domestic air services had reached a peak in transportation capacity. The Soviet Union-made An4-Antonov 24 aircraft, (50 passengers) is presently used for domestic flights. The total number of passengers in 1990 increased to 8,514 from Savannakhet to Vientiane, 8,891 from Vientiane to Savannakhet and Pakse and 943 from Savannakhet to Pakse. The number of passengers is observed to annually increase at around 20 to 30%.



## <2> Flight Fare and Permission

The flight fare as of June, 1993 is as follows:

(oneway trip)	Lao Citizens	Foreigners
- Vientiane ← → Savannakhet	16,300 kips	52 US\$
- Savannakhet ← → Pakse	9,900 kips	36 US\$

A domestic travel permit is required for Laotians as well as for foreigners, and can be obtained at a police station. The same permission is also needed for trips by bus or by boat.

### (2) Electricity, Telecommunications

#### 1) Existing Electric Supply Conditions

The Electric Power Company of Savannakhet Province is under the direct control of the Ministry of Industry.

Before 1973, the city electricity was provided from a diesel electric power plant. Since then, electricity has been imported from Thailand through a 22KV electric power cable that runs across the Mekong River and is connected to the districts of Khanthabouly, Champhone, Outhomphone and Atsaphantong.

The electrification ratio of Savannakhet City is 95%. However, most of the rural areas are not supplied with electricity. Since extension of electricity supply is one of the main objectives of the Third Five-Year Plan, implementation of electric supply to households is being promoted nationwide. Electrification in B. Lak 35 and its surroundings will be carried out by 1994.

#### 2) Telecommunications

The Savannakhet Telecommunication Enterprise is under the supervision of the Savannakhet Government Administration, although actual activities are directly controlled by the head office of the MCTPC of Vientiane.

The telecommunication system in Savannakhet is in a primitive condition, with only 210 telephone lines. Phone calls within the city can be made directly, otherwise one has to direct calls to

the operator for assistance. Telegrams are the sole means of communication in emergencies and for overseas communications. Telegrams can be sent abroad via Vientiane.

In the Savannakhet Post Office, mail is distributed in 600 post-office boxes that are rented for 4,800 kips a year each (1991); there is no mail delivery system.

The Lao PDR Telecommunication Improvement Project, implemented with the assistance of Japan and expected to be completed in 1993, plans to establish 10,000 telephone circuits in Savannakhet City.

### (3) Water Supply

#### 1) Savannakhet City Waterworks

The Savannakhet City water supply facilities were constructed with the assistance of France. The water intake tower was built in 1973 and the service pipe facilities were completed in 1975. At present about 1,000 m<sup>3</sup> of water is produced daily. The water supply ratio in the city is about 65%.

#### 2) Rural Water Supply

Unlike the city water facilities, the villages in the Project Area rely on shallow wells, springs, rivers and ponds for domestic water supply. The depth of the shallow wells ranges from about 2 to 15 m. Most of them dry up during the dry season.

#### 3) Sewerage

There are no systematic sewers in the cities and villages within the Project Area. Only rainwater drain ditches are constructed.

### 2.3.4 Outline of the Agricultural Sector

#### (1) Present situation and factors that impede development

The 1990 the rice production of Savannakhet Province was 236,000 tons, 15.6% of the nations production output. However, only 1,280 ha is used for the cultivation of paddy in the dry season, as opposed to the 79,000 ha for rainy season paddy cultivation,

due to the poor extension of irrigation facilities; the majority of this area is used for rainfed paddy fields, usually producing an unstable yield.

The ratio of crop output to national production output is shown in Table 2-18.

Table 2-18 Crop and Livestock Production Output Ratio to National Production Output

	Area (ha)	Yield (t/ha)	Production (t)	National Production Ratio (%)
Rainy season paddy	78,915	2.83	223,329	20.5
Dry season paddy	1,281	2.93	3,753	9.6
Upland Rice	6,925	1.27	8,795	2.3
Potatoes	1,080	15.59	16,840	10.4
Maize	3,435	1.70	5,840	7.1
Vegetables	670	8.40	5,628	9.3
Soybeans	15	1.33	20	0.4
Mungo beans	350	0.90	315	12.1
Peanuts	500	1.10	550	6.9
Tobacco	650	4.50	2,925	5.0
Cotton	750	0.64	480	9.6
Sugarcane	150	20.00	3,000	2.7
Buffaloes (head)			174,897	16.5
Cattle (head)			209,037	24.6
Pigs (head)			102,400	7.1
Sheep and goats (head)			15,213	14.6
Poultry (x 1,000)			483.5	5.9

Source: Lao P.D.R. Basic Statistics

92-93% of the rice is rainy season paddy. Production, however, is controlled by natural conditions, and is therefore unstable. Further, the marketing systems and facilities are very poor and the farmers' economy and the rural economy are greatly affected by flood and drought.

For example, self-sufficiency in rice failed and the number of livestock and vehicles extremely decreased due to the 1987 and 1988 drought and flood. The potential of the Project Area for agricultural production is high considering that it has a good

location and rich natural resources, yet agricultural development is behind due to limited funds.

For a stable agricultural production and its growth therefore, the following problems related to agricultural development were brought forward.

1) Development of irrigation facilities for a stable rainy season crop production

Water resource development and irrigation will be set up in order to do away with dependence on unstable natural conditions. Increased and stable production as well as improved productivity will be achieved by conducting supplementary irrigation in the rainy season.

2) Expansion of irrigated paddy field area during the dry season

Through water resource development and the effective use of water, the paddy field area to be irrigated in the dry season can be expanded and crop diversification can be promoted.

3) Expansion of input materials for production

According to the IFAD and ADB estimate concerning the amount of fertilizer needed for food production in the Project Area, 1,400 ha of land could be dressed if a standard application of about 150 kg/ha is adopted for the use of 210 tons of fertilizers (16-21-0) donated.

This fertilizer volume is assessed to be adequate for the present 1,281 ha of dry season crops (1990). 260 tons of fertilizer (46-0-0) can only be applied on 26,000 ha of nursery beds even with a 10 kg/ha application, and will only cover one third of the rainy season paddy fields (78,195 ha).

The Feasibility Study reports that an input of 20 to 60 kg/ha of chemical fertilizer is not effective enough. A stabilized production due to development in irrigation and the extension of dry season paddy irrigation and introduction of marketable crops are expected to bring about increased agricultural income. Further, a credit system shall be set up and accumulation of funds for fertilizer purchase shall be planned to promote effective input of fertilizers.

#### 4) Rural Road Improvement

Almost all the farm and rural roads are poorly maintained making vehicular passage in the rainy and dry season difficult and even impossible. Transport of agricultural input materials and delivery of agricultural produce are thus impeded. This situation also makes it difficult to sell the harvests at high prices and makes the expansion of cropping almost impossible.

Therefore, to guarantee the effects of irrigation development and to activate agricultural production and sales activities, these roads must be repaired and improved.

#### 5) Improvement of the Marketing Structure

Since the agricultural economy shifted to a free market economy and agricultural organization was reformed, improvements in the marketing system have become a very important matter for both the government and the farmers. Introduction of irrigation is thought especially to increase productivity and potentially double farmers' paddy production, hence gaining marketable surplus rice. This is why a support system must be developed in order to provide market information services and guidance regarding transportation and marketing activities when market prices are high.

#### 6) Extension and Guidance System

Owing to the subsistence agricultural system adopted by small-scale farmers, demand for guidance and extension of farming techniques are non-existent, and thus the government guidance and extension system for agricultural techniques is very poor.

The shift to a market economy-oriented agriculture will require the urgent settlement of an efficient system for guidance and extension of agricultural techniques to promote irrigation and crop diversification.

### (2) Rural Life and Farming Conditions

#### 1) Village Organization

The administrative structure of the village is centered on the village Chief who is assisted by 2 or 3 persons. The substructure

of the village is divided into collective units called "Kum", "Nouy" and "Chu".

A "Chu" is composed of a group of 5 to 10 households. 2 or 3 "Chu's" form a "Nouy" and several Nouys will compose a "Kum". In each village, the Women's association, the senior association and the garrison are mobilized on different occasions varying from ceremonies to collective corvées. In some villages, people mutually cooperate in retaining rice as a common stock.

## 2) Extension of Agricultural Techniques and Facilities

### <1> Extension of Agricultural Techniques

Improvement and extension of agricultural techniques to rural areas is predominantly executed by the technicians of the Savannakhet Department of Agriculture and Forestry. The number of technicians for agricultural extension by district is listed below.

District Name	No. of Technicians	No. of Households/Technician
Saybouly	8	759 (1,072 ha)
Outhomphone	8	1,233 (1,179 ha)
Khantabouly	6	2,885 (1,770 ha)
Champhone	15	828 (1,064 ha)
Songbouly	0	0
Songkhone	28	443 ( 440 ha)
Atsaphanthong	30	424 ( 436 ha)
Others	28	653
<b>Total:</b>	<b>123</b>	<b>Average: 761</b>

Source: Savannakhet Department of Agriculture and Forestry  
( ) : cultivated land area under the charge of 1 Technician

The extension activities are conducted by public enterprises and cooperative associations through the procurement of agricultural inputs and the collection and sales of produce. Transfer of technology was generally practiced, but was not successful.

The impeding factors are insufficient management of public enterprises, restrictions on local agricultural prices and delay in payment, shortage of funds for material purchase and

maintenance, transportation difficulties, etc. At all events, agricultural extension in Savannakhet Province is underdeveloped compared with the surrounding areas of Vientiane City.

#### <2> Production and Distribution of Seeds

The Thasano Seed Center is located 12 km from the outskirts of Savannakhet City. Production and distribution of paddy rice seeds are carried out in the rainy season, while corn and peanuts are carried out in the dry season. However, since the distribution system is poor and seed production is low, seeds are sold at the fields.

The 29,000 tons of paddy rice seeds produced in 1990 could only provide for 730 ha, since an estimate of 40 kg/ha of seeds is required.

#### <3> Farming Loans

The Department of Agriculture and Forestry is implementing a farming loan system with an interest rate of 0.5 to 45%.

The upper-limit of the low interest loan is 500 US\$ and the term of payment is 10 years. However, in order to apply for a loan, documents for property estimation, repayment plan and compensation measures are required. Procedures are difficult and document screening is very strict and only a few farmers have been granted approval.

#### <4> Post-harvest Facilities

The farmers store rice for self-consumption in their respective barns or granaries. Besides, most of them still mill rice in mortars, by treadmill, or by handmill.

The liberalization of the sales of rice under NEM led to the construction of power-operated rice milling facilities in Donghankhou (H. Bak Area), Nankham (in the vicinity of the Namphou Area) and B. Lak 35. These facilities mill rice for sale and for self-consumption.

These small milling machines have a capacity of less than 100 kg/hour. There are 3 large post-harvest facilities (mill or storehouse) out of the Project Area, as shown below:

a. Lak 4 Agricultural Enterprise

Location: 4 km from the center of Savannakhet City  
Capacity: 200 kg/hr (Power: 25 HP)  
Fee: 150 Kips/15 kg  
Auxiliary  
Storehouse: Fertilizer storehouse of 150 m<sup>2</sup> (storage of main fertilizer (KR-2) (donation) and agricultural chemicals)

b. Keo Hongshi Rice Mill (Private)

Location: 1 km from the Savannakhet City Center  
Capacity: 100 kg/hr., 18 HP Diesel  
Fee: 200 kips/15 kg, free of charge if exchanged with rice bran.  
Auxiliary  
Storehouse: 15 m<sup>2</sup>; used to store wheat

c. Savannakhet Food Storage Company ( 5 km in the city)

Storage capacity: Max. 5,000 tons

d. Thasano Seed Center

Milling Capacity: 500 kg/hr  
Auxiliary  
Storehouse: 50 m<sup>2</sup>



## CHAPTER 3



## CHAPTER 3      OUTLINE OF THE PROJECT

### 3.1    Objective

1) Based on NEM, the country's basic policy for national construction and agricultural development aiming for national agricultural economic reform and the shift from a centralized economy to a market economy, the Government intends to reconstruct the country, as indicated the specific strategies to achieve its objectives in the 2nd Five-year plan conducted from 1985 to 1990, and has carried out various economic reforms.

Based on the 2nd Five-year plan, the Government formulated the following basic policies for the 3rd phase of the Five-year plan, which mainly aims for the shift to a market economy:

- <1>    To elevate the standard of living by satisfying the basic demands of the people, i.e., food, livelihood, health and sanitation, education, etc.
- <2>    To maintain economic stability simultaneous with progress in economic growth.
- <3>    To maintain friendly relations with other countries, especially neighboring countries.
- <4>    To avoid over-dependence on specific countries by ensuring self-sufficiency in food production and considering economic independence through its access to the Siam Gulf and the South China Sea.

These policies will be implemented in accordance with the principles and materialization of NEM. Through the attainment of the objectives, national economic growth and development can be assured.

2) The main objectives of the 2nd and 3rd Five-year plans are to:

- Stabilize production and provisions, and guarantee self-sufficiency in food production

- Diversify crops, expand production of crops for export
- Introduce an agricultural market economy, revolutionize agricultural production

To attain these objectives, the following should be realized:

- Stable production of rainy season paddy and expansion of the production of dry season paddy through irrigation.
- Expansion and diversification of crops by increasing dry season irrigation area.
- Programs to improve the extension system for cultivation and farming techniques, to develop the ecosystem and extension activities that would meet the farmers' demands, and to formulate optional and integrated extension activities for the introduction of new techniques, preservation of the ecosystem, and the attainment of high profits.
- Programs to improve agricultural production and sales and trading conditions by developing rural infrastructures (roads, communications system), and to introduce farming activities based on market economy principles.
- Programs to rejuvenate farmers' view of the economy by improving agricultural statistics and establishing a market information service system.

3) This requested Project was formulated in consideration of the basic policies of the Lao P.D.R. for the agricultural development plan. A grant and has been requested for its implementation and is expected to largely contribute to the attainment of the Government's objectives.

This request which is mainly on agricultural growth and development, shall be focused on Savannakhet Province of the largest rice-producing district (15.6% of total rice production amount). Under NEM, the request aims at stability and expansion in agricultural production, a reformed agricultural structure, improved farmers' economic standing, and activated local economy. To achieve these objectives, the two areas in Savannakhet Province subject to irrigation development are the main targets for the implementation of an integrated agricultural development plan. The objectives of this plan are shown hereafter.

<1> Construction of irrigation facilities at H. Bak Upstream and Namphou areas

- Construction of irrigation facilities to conduct stable supply of water in rainy season paddy fields, and aim at a stable rainy season paddy cultivation, improved productivity, and increase in production.
- Maximum and effective use of developed water resources and irrigation facilities, expansion of dry season cultivation area, increase in paddy yield, and aim crop diversification and expansion of commercial crops through dry season irrigation.

<2> Improvement of rural infrastructures, such as roads, etc.

- To improve the main rural roads and construct some in the two areas subject to agricultural development, to improve the transport of agricultural inputs and produce and trading conditions of the produce, to activate agricultural production based on market economy principles, and to arrange and improve residents' traffic services and living conditions.
- To construct shallow wells to provide a stable supply of clean groundwater to the residents of the 10 villages within the circumference of the area subject to irrigation development, and at the same time to promote health and sanitation in the villages.

<3> Agricultural Supporting Center

- To achieve all the possible benefits from irrigation development, required facilities and machinery should be installed in the Center which will conduct training, demonstrations, guidance in and extension of the new technologies for irrigation agriculture.
- To help the sales of newly introduced commercial crops and surplus rice resulting from improved production due to irrigation, and to urge the shift to a market economy.
- To help purchase and store agricultural input to guarantee increase in productivity in irrigation agriculture.

- To encourage fish breeding in irrigation fields for the intensive and effective use of irrigation water and fields and to establish a source of cash income for farmers.
- To construct a management office, multipurpose building, granary, storehouse for fertilizer, a garage, facilities and machinery, a fish breeding pond and the accompanying facilities required, to attain the above-mentioned objectives.

## 3.2 Study and Examination on the Request

### 3.2.1 Suitability and Importance of the Requested Plan

#### 1) Importance of the Plan

In 1990, rainy-season paddy in Savannakhet covered 92% of the cultivated area and 92.8% of the production. More than 98% of this paddy land was cultivated with rainfed paddy fields, which is considered to yield extremely unstable production.

Stable paddy production is expected to stabilize farmers' economic conditions, mainly stability in the resident farmers' welfare, and lead to the economic growth and development of the project area and the country as a whole. It is not an exaggeration to assume, therefore, that stability in production can only be achieved through stability in rainy-season paddy production.

This integrated agricultural development plan is, therefore, expected to advance agricultural development in nearby areas from its various effects as a pilot project, due to the fact that it is adjacent to national roads 13 and 9.

Rainy season paddy production will be increased to 5,400 tons, twice the present amount of 2,500-2,700 tons, through the construction of the requested facilities. Through dry season irrigation, approximately 4,275 tons of dry season paddy can be produced in a normal year, and if 1/2 of the irrigated area is planted with rice and the other half with commercial crops like peanuts, a yield of 2,475 and 1,125 tons can be expected respectively. According to the feasibility study, benefiting farmers will harvest 4.5 times more than the present for farmers of 1 ha cultivation and 6 times for farmers of 1.5 ha cultivation in the gross income, the former earning 12 times more and the latter 86 times more in the net income.

The construction of irrigation facilities will result in rice and commercial crop production that far exceeds the consumption of every benefiting farmer's household. Independently, farmers will be able to freely sell the surplus rice and various cash crops produced, thus implementing the structural change in agricultural management in accordance with market economy principles.

The request shall aim for the following through the construction of irrigation facilities:

- Stabilization and improvement of food production, particularly rainy season paddy cultivation and production;
- Expansion of dry season paddy cultivation area and crop diversification.

At the same time, construction of an agricultural supporting center which will support and promote farmers' activities through the extension and expansion of new production and farming techniques is required to guarantee effectiveness of irrigation and to extend the practice to a wider scale.

Also, to activate agricultural production and various economic activities in the subject area where trade is hindered due to poor maintenance system and remarkably damaged roads, 3 of the rural roads will be repaired. Besides, domestic water supply facilities will be constructed as one of the means to promote health and sanitary conditions.

Therefore, the implementation of this plan will largely contribute to the establishment of a market economy based on NEM and to the achievement of the objectives set up for the 3rd Five-year plan. It is also expected to bring forth increase in the income of benefiting farmers compelled to rely on rain water for self-sufficiency in paddy production, release them from poverty, and improve their standard of living. Thus, as the first and biggest integrated agricultural development in Savannakhet Province, it is expected to considerably contribute to its growth and economic development.

## 2) Suitability of the Plan

Savannakhet Province, has an extremely low percentage in irrigation development with only 1300 ha, 1.6% of its paddy field.

Regarding GDP of the province, the agricultural sector covers 86% of which 42.4% is crop produce, with rice accounting for 65% of the produce.

90.5% of the total rice output is rainy season paddy, 1.5% dry season paddy, and 8% upland rice cultivated in slash and burn fields.



This request, which is mainly for an irrigation development plan, rural infrastructures improvement plan, and an agricultural supporting center construction plan, will be implemented as a pilot project to promote agricultural development in the specified area.

The introduction and establishment of the irrigation method will guarantee the farmers of the subject area a production twice as much as the present and the free sales of the large surplus rice produced.

Most of the farmers with surplus rice production are without the necessary management and storage facilities and quite inexperienced in free sales and marketing activities. Therefore, a policy suitable for the management of surplus rice will be formulated and support in sales and marketing activities will be extended.

A multipurpose Agricultural Supporting Center will be constructed for the construction, operation and maintenance of irrigation facilities for effective irrigation. The construction of the Center is also needed to extend new cultivation and farming techniques, conduct guidance, training and demonstrations regarding their use, and at the same time to support the farmers' sales and marketing activities and shift in cropping system, and to hasten agricultural reform based on market economy principles.

Three of the rural roads in the project Area, which are in bad condition due to lack of funds, will be repaired and improved.

Commercial conditions in the area should be improved also, as production will be bettered, and increase in agricultural input and output is foreseen.

The improvement of rural infrastructures will improve traffic services in the subject area, thus widening the chances for cultural and information exchange, activating agricultural production and market conditions, and increasing the effects of irrigation.

In accordance with the improvement of infrastructures for agricultural production, wells will be constructed in 10 villages within the irrigation area, to facilitate the acquisition of domestic water of residents who basically rely on unclean water resources such as nearby rivers, lakes and swamps. The construction is expected to promote improved living and health

and sanitary conditions.

The construction of a dam in upstream H. Bak will lead to the construction of a reservoir measuring approximately 4.7 square kilometers. However, the construction will submerge some of the 35 houses of the 47 households that make up Nonnadi. In consideration of the request, the Government has already discussed the formulation of various policies that include the relocation of these residents and received consent regarding the construction of the dam and reservoir.

It has also been ascertained that there are no special species of fish and animals that need to be protected from the construction of the dam and reservoir.

The request has been formulated in consideration of the basic policies for the achievement of the objectives of the 3rd Five-year plan, and is considered to positively influence the reconstruction of the nation's policy.

### 3.2.2 Operation Plan

#### 1) Implementation and Operation System

The implementation and operation of this plan shall be carried out through the joint cooperation of MAF and its counterpart in Savannakhet Province.

Both agencies will organize an "Operation Committee for the Savannakhet Integrated Agricultural Development Project", which shall be composed of executive employees selected from related agencies. They shall also supervise the construction of the Project Construction Office and assign an office head and vest him with authority respective to his post.

The construction office shall carry out their responsibilities and promote the progress of the Project. The Operation Committee shall regulate the terms of approval for the diverse administrative rights regarding the project and the construction works, and will actively support the head of the project construction office with his duties and responsibilities.

The operation of the entire constructed facilities, with the exception of the Agricultural Supporting Center, shall be made

the sole responsibility of the Savannakhet provincial government for effective maintenance, operation and management.

In accordance with the grant aid system, the recipient government institution for the turnover of the constructed facilities is the Department of Agriculture and Forestry of Savannakhet Province.

Simultaneous to the completion of the construction works, the construction office will be reorganized as the Savannakhet Integrated Agricultural Development Project's maintenance and management office. The head shall be assigned by the provincial Governor, and will supervise the operation, maintenance, and management of the facilities, as well as the water management. MAF, however, has the right to interfere, when necessary, and provide the office head with proper guidance and direction pertaining to the operation and management of the facilities.

The maintenance and management office shall be directly under the control of the provincial Governor, shall abide by the instruction of the Department of Agriculture and Forestry, gain the cooperation and support of the Agricultural Supporting Center's operation committee, and carry out the following:

- <1> Irrigation water intake and distribution planning
- <2> Irrigation water management
- <3> Hydrologic and meteorologic observations;  
arrangement and filing of records and data
- <4> Maintenance and repair of all facilities
- <5> Maintenance and management of all machineries
- <6> Guidance in and extension of water management techniques
- <7> Discussion on management of rural roads with DCTPC and  
management activities
- <8> Maintenance and management of rural water supply facilities

The Agricultural Supporting Center shall be operated and managed through the joint cooperation of the Ministry of Agriculture and Forestry and the Department of Agriculture and Forestry of Savannakhet Province. Both agencies shall organize an Agricultural Supporting Center Operation Committee composed of

senior officials of every related agency and farmers of concerned areas, and shall appoint a head of the center.

The operation committee will be responsible of deliberating upon the various conditions regarding the operation and management of the center, shall provide the Center with proper advice and support, and must ensure the smooth execution of the services.

Upon discussion with the operation committee and with their support, the head of the center will draft the operation plan, supervise and, command the employed personnel, and carry out the following:

- <1> Improvement and extension of agricultural techniques
- <2> Training and demonstrations on farming techniques
- <3> Storage and sales of surplus rice
- <4> Guidance in fry breeding, sales, and fish breeding
- <5> Women's training and the improvement of living conditions
- <6> Support the sales and purchase of agricultural facilities, granting of credit and farming loans
- <7> Offer services for the marketing of agricultural produce and the diffusion of market information
- <8> Storage and distribution of fertilizer, agricultural chemicals, and donated materials for increased food production

Although the above paragraph states the system and the division of duties for the implementation and operation of the plan, MAF and Savannakhet Province have appointed the Department of Agriculture and Forestry of Savannakhet Province as the main executing agency responsible for the formulation of the plan and to perform the duties pursuant to its implementation such as the felling of trees in submerged areas for dam construction and the acquisition of land for the relocation program.

Both parties shall also select and secure the required personnel once the Government of Japan has approved the request for Grant Aid for the construction of the requested facilities. Discussions are presently ongoing and a draft is being formulated.

The proposed implementation system is ideal, but imposes the problem of securing the level of personnel required.

Although quite a number of middle level engineers and experts have undergone training again on the improvement and extension of irrigation and agricultural techniques, they usually dislike being assigned to rural areas, making the recruitment difficult and widening the gap between the agricultural techniques of Vientiane Metropolis and the provinces. Accordingly, there is a need to formulate measures to counteract such conditions.

## 2) Budgetary Measures

The 1989 state estimated expenditure indicated an appropriation of 5,249 million kips for agricultural development, totaling 4.3% of the overall state budget and 8.8% of development project expenses.

The budget appropriated for agricultural development is relatively low. This may be attributed to the recent attainment of stability and self-sufficiency in rice and crop production which caused the focus on infrastructure installation to shift to other industries to promote development.

Agricultural production is the most important national industry because it is responsible for 40% of the GDP, hence a steady development and growth is desired for this industry. Moreover, it is also given considerable importance in national industrial and economic development projects and in budget allocation measures. This basic policy is forecast to remain unchanged even in the near future.

The sectoral development project expenses and their ratios for the past 6 years, from 1985 - 1990, are shown in Tables 3 - 1 and 3 - 2.

Table 3 - 1 Sectoral Development Expenses

(unit: million kips)

	1985 actual	1986 actual	1987 actual	1988 est.	1989 est.	1990 est.
Total	10,184	11,732	13,480	47,006	66,455	66,080
Education	265	780	1,139	2,169	2,885	3,146
Insurance	601	714	805	1,435	258	851
Agriculture and forestry	1,549	1,993	2,086	7,669	5,689	8,696
Mining	1,556	1,208	1,276	10,122	22,472	18,535
Transport. & Communications	3,717	4,491	4,886	17,495	24,540	29,126
Trade & Commerce	489	442	808	1,676	83	...
Public Services	496	654	720	1,527	74	...
Other	1,511	1,450	1,760	4,915	10,454	5,726

(est. : estimate)

Table 3 - 2 Development Cost Ratio by Sector

(unit: %)

	1985 actual	1986 actual	1987 actual	1988 est.	1989 est.	1990 est.
Education	2.6	6.6	8.4	4.6	4.3	4.8
Insurance	5.9	6.1	6.0	3.1	0.4	1.3
Agriculture and Forestry	15.2	17.0	15.5	16.3	8.6	13.2
Mining	15.3	10.3	9.5	21.5	33.6	28.0
Transport. & Communications	36.5	38.3	36.2	37.2	36.9	44.1
Trade & Commerce	4.8	3.8	6.0	3.6	0.1	0.0
Public Service	4.9	5.6	5.3	3.2	0.1	0.0
Other	14.8	12.4	13.1	10.5	15.7	8.8

Source: Ministry of Finance, Economy and Planning

An implementation plan and annual project plan will be formulated and budget planning will be conducted on the basis of the minutes of the meeting between the Government and the Study Team concerning the Basic Design Study. Agricultural tax revenues are the targeted resources for the budget required.

The Savannakhet agricultural tax revenue is considered capable of providing the implementation and operation budget with the 8 - 10% increase brought about by stability and increase in the production of rice and other agricultural produce, as shown in Fig. 3-1 below.

Unit : thousand

Conversion to US\$

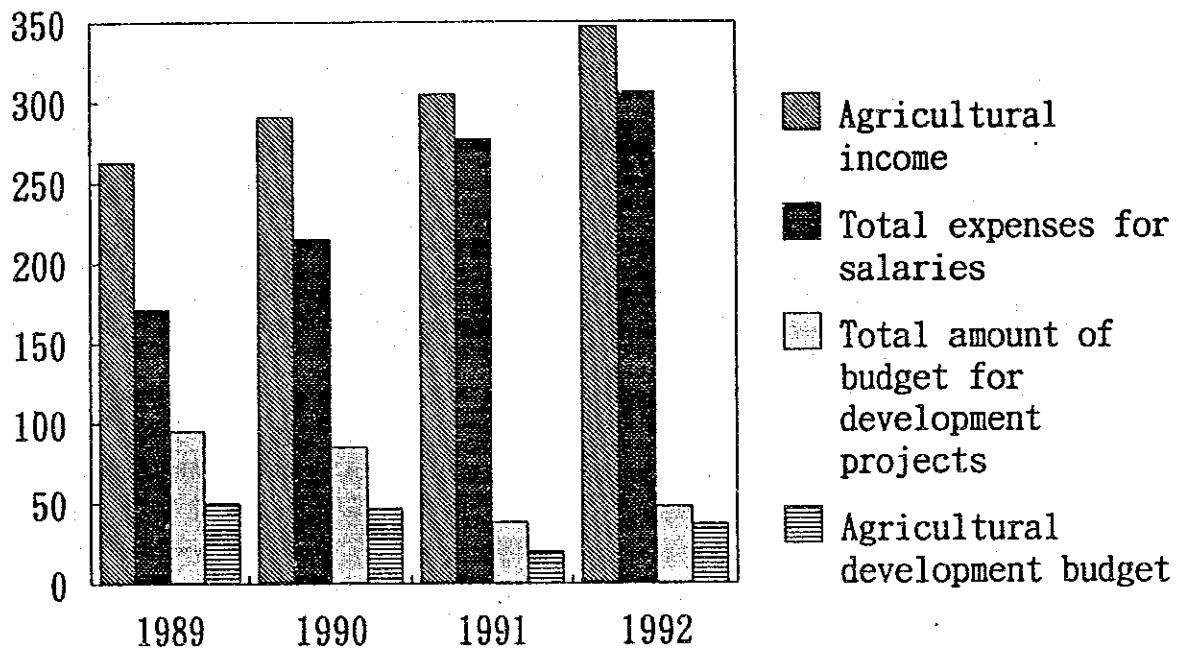


Fig. 3 - 1 The Development Projects Budget of the Savannakhet Department of Agriculture and Forestry (1989-92)