

第5章 本格調査の実施方針及び留意事項

5.1 本格調査実施方針

本格調査の目的は、ラム・ドム・ヤイ川流域の全体農業開発計画の作成及び優先度の高い1～2か所の事業についてF/Sを行なうことである。

本格調査は、第一段階と第二段階に別れて行なう。

第一段階においては、流域全体の調査を行ない第二段階においては、優先度の高い事業の可能性調査を行なう。

1 第一段階 流域全体調査

(1) 流域に関する現存する関連データ及び情報の収集・評価・分析を行なう。

- ① 自然条件（地形、気象、水文、地質、土壌、水質）
- ② 社会経済条件（地域の社会経済、国家開発計画及び地域開発計画、社会資本）
- ③ 農業条件（土地利用、作物、作物類型、農業生産額／量、灌漑排水、水利用及び水管理、水利権、農業慣行、農業経済、土地保有、農産品加工、市場、農業組織及び普及）
- ④ その他（建設資材、環境、その他）

(2) 必要に応じて上記の項目の現地調査を実施する。

(3) 流域における現存及び調査中の灌漑開発計画の評価を行なう。

(4) 水資源及び土地資源の開発可能性の確定と評価を行なう。

(5) 全体農業開発計画の作成及び優先度の高い事業の選定を行なう。

2 第二段階 選定された優先度の高い事業の可能性調査

(1) 補充すべきデータ及び情報の収集と必要に応じた詳細調査を行なう。

(2) 灌漑農業開発計画の作成を行なう。

- ① 土地利用、作物類型及び農業体系に関する開発計画
- ② 灌漑排水に関する開発計画
- ③ 農業組織及び支援組織に関する開発計画（収穫後処理及び流通計画を含む）
- ④ 灌漑排水施設の予備設計
- ⑤ 事業実施計画
- ⑥ 維持管理計画

(3) 事業の費用及び便益の見積りを行なう。

(4) 事業の評価、環境影響調査を行なう。

5.2 本格調査実施上の留意事項

現況においては灌漑施設は皆無に等しく流域内の水稲作の生産安定のために、流域の灌漑施設を整備することは効果が大きい。また現在進行中の各種灌漑計画相互の調整が望まれる。このため流域灌漑計画の樹立は早急に行なわれるべきである。

現況の問題点を把握した上で次のような方向で本格調査を取り纏めるべきである。

(1) 流域内土地利用計画

現在流域の土地利用計画図は作成されているが、今回流域全体の水資源配分計画を策定するにあたり、RIDとも協議の上、日本側調査団としても将来土地利用について十分な検討を加えることが必要である。その場合、調査対象地域における土地制度、栽培技術水準、農業経営の発展段階を考慮する他、タイ国の行政組織との関わり方や、国土保全との関係に十分配慮するべきである。

(2) 基本図の作成

全ての計画の基本となる基本図は、1974年に作成された航測写真から作成された5万図を縮小した10万図を使用することとなる。

さらに小縮尺の地形図(1万図程度)は、同一の航測写真を図化して作成されることとなる(RID側実施)。新しい航測写真は、本格調査団が実施することを含めてタイ国の国防上の問題から非常に困難な模様である。このため流域内の詳細な地形図を作成することは、時間の制約された本格調査の期間内に作成することは不可能であろう。

土地利用の現況については、衛星写真等のリモートセンシング技術を活用して補正することが可能であるが、地形標高等については、補備測量等を行うことにより現況に対する補正を行う必要がある。

(3) 水資源配分計画

流域の水資源賦存量に制約がある場合において、水資源量に応じた作物栽培体系を計画することは合理的なことと考えられる。このために流域全体の水資源開発計画を確定し、全体計画に従ったダム建設を進め、集水流域面積が相互に重複するようなことが起きないようにするべきである。

また流域の農業条件を検討して、水資源を配分すべき作物と栽培面積を決めなければならない。

この場合前述の土地利用計画との関係において、場合によっては現況水田を森林に復元することの可能性を含めて水資源配分計画を定めるべきと考える。

(4) 可能性調査(F/S)

1960年代に計画されながらも諸事由により事業実施に結びつかなかったという今回調査の背景よりして、タイ側は今回調査の結果を事業実施に結びつけたいという強い意向を

有している。その意味では今回調査のF/Sは重要な位置を占めるものである。しかし、その一方で、当初計画作成時から現在に至る間に、調査対象地域内の土地利用、社会・経済状況は大きな変化を経てきていることから、流域内の土地利用現況・計画を見直すことや、流域全体の水資源配分計画を策定することも同様に重要性を持つものである。

因に流域内中流部で計画されているいくつかのダムは、貯水量は大規模であるが、ダム規模はそれ程大きなものでないため、F/S段階においては他地区の事例を参考に設計できると考える。

全体計画との関連において、大規模、中規模、小規模の各事業分類を、事業費規模ではなく、支配面積に関して階層的に整理し直すべきである。

全体計画の樹立の一環として、大規模案の代替案としての中小規模分散案や河道貯留型頭首工についても検討を加える必要がある。

(5) 配水計画の樹立

現在の水資源開発計画は、適切な地形図が入手しにくいという事情があるにせよ、余りにも実際の水利用とダム計画の関連が欠落しており、将来幹線水路から支線水路を建設していく段階において、大幅な計画上の手戻が生じる可能性が高い。

地域全体の水資源配分計画を策定する段階において、水源と受益地の組み合わせを検討して、位置のエネルギーの活用により将来の運転管理費を節減するべきである。

(6) 末端整備計画

開発の基本方向で述べたように、現況において、水源施設が完成しても最終的な利用形態のための施設整備が完了することは望めないため、最終施設整備計画の他に暫定水利用施設や補助手段などについても検討することにより、水源施設の効果を早期に発現させる必要がある。

(7) 段階的整備手法の明示

現在の農業技術がかなり低位にあることから、性急に先進的な灌漑技術を強制することは避けなければならない。しかし、水源確保のためのダム建設を社会的な背景から先行させる必要があるため、最終的な整備段階を見通して事業の推進を図るべきである。

(8) F/Sの前段階で概略比較を行なう必要がある

前に述べたように、信頼できる地形図が入手できないため、F/S対象地域を選定するためには、予備的作業が必要である。

付 属 資 料

1. 要 請 書
2. 実 施 細 則 (S/W)
3. 協 議 議 事 録 (M/M)
4. 収 集 資 料 リ ス ト

1. 要 請 書

Request for Technical Assistance Project

Project Title: The Feasibility study on the Lam Dome Yai Basin Irrigation Project

Requesting Agency: The Royal Irrigation Department
Ministry of Agriculture and Cooperatives

Proposed Source of Assistance: The Government of Japan

Background

Northeast Thailand has been regarded as the most backward and undeveloped region of the country with poverty problems caused by insufficient water resources, poor soils, severe climate, a high density of population etc.

The Thai Government intends to develop the rural areas of Northeast Thailand and the national development policies set forth in the fifth National Plan (1982 - 1986) and in the Six National Plan (1986 - 1990) call for the alleviation of poverty in the rural areas and income redistribution between the rural and urban areas.

Among several kinds of governmental investment for the development in the Northeast region, the most important and urgent subject is to promote development through more efficient utilization and rehabilitation of lands and water resources in order to increase agricultural output, stabilize the farmers' lives and alleviate poverty problems. Very important in achieving these goals is the development of water resources to supply water for irrigated agriculture.

The Lam Dome Yai Basin is located in Ubon Ratchathani between the Lam Dome Noi Basin to the east and the Huai Khayeng Basin to the west. Its drainage area is 3,285 Km² covering the administrative districts of Nam Yuen, Na Chalieow, Det Udom and Pibul Mung Saharn in Ubon Ratchathani province.

The Lam Dome Yai flows northward from the mountainous areas near Laorian and Cambodian borders (elev. 750 m) passes through Det Udom township and empties into the Nam Mue at an elevation of 110 m above m.s.l. Its total length measuring about 210 Kms. Over the upper course of this stream about half of its length a remarkable torrential flow may be observed every year. This slows down as the bed slope becomes flatter and more gentle, but the tremendous volume of runoff, averaging about 1,660 x 10⁶ m³, causes a big drainage problem in the Nam Mue Plain. The agricultural lands adjacent to its course on both banks are subjected to inundation and due to lack of irrigation facilities, remain unutilized despite the large volume of water in the stream.

The Lam Dome Noi basin, which is located to the east of the Lam Dome Yai basin, has been developed by the Electricity Generating Authority of Thailand (EGAT) and the Royal Irrigation Department (RID). EGAT has

operated its power generation station at the Lam Dome Noi Dam since 1966. Beginning in 1969, the RID constructed a pumping station at the dam and a system of canals to irrigate an area of 150,000 rai, or 24,000 ha. This project was completed in 1983.

At about the same period, RID also planned to develop the Lam Dome Yai basin but due to a shortage of funds, personnel and equipment, this has not been possible. Along the right bank of Mune River, there are 8 principal tributaries draining the land bordering the Cambodia and the Laos and among these the Lam Dome Yai basin remains the largest area where a substantial development project has not been undertaken. From the standpoint of natural security, this area certainly deserves attention. Moreover, the soil characteristic of the Lam Dom Yai basin has been found to be of higher fertility than that of Lam Dome Noi. Therefore, good yield may be expected from an irrigation project.

A number of sites have been considered for dam construction for irrigation, the RID's Northeast Regional Office in Korat, using on a military map of the 1:50,000 series, first, located a long dam site (3.5 Km) near Ban Tha Pho Sri and Ban Tha Wari villages. A storage capacity of nearly 1,500 10 m was expected, but the drowned area seemed to have the same extent as that to be serviced. This site was given up and a new one 8 Kms upstream near the junction of Lam Som tributary was selected in order to reduce the area of good land submerged to about 14,000 rai or 2,300 ha. The retention level was planned to be 142 m above msl and the dam length to be 3.0 Km. The reservoir capacity was estimated at 6-7.00 x 10 m. No further detailed study was undertaken.

Seventeen years later, in 1982, Regional Irrigation Office 5 took up the project, reviewed it and again moved the dam site upstream northeast of Ban Kam Patao. The dam length was reduced to 2.5 Km and its crest was 25-27 m above the stream bed, so it could be categorized as a Medium Scale Project. At a retention level of 145 above msl, a capacity of 400 x 10 m was expected and the service area was estimated to be 300,000 rai or 48,000 ha.

2. Details of the Project

2.1 Project Objectives

- (1) To review the overall Lam Dome Yai Basin water resources development plan
- (2) To identify the possible projects and recommend the stage-by-stage development plan.
- (3) To conduct the pre-feasibility study on the potential project(s).
- (4) To conduct the feasibility study on the first priority project, and
- (5) To undertake on-the-job training of the government's officials in the course of the Study.

2.2 Outline of the Study

(1) Study Area

The study area covers the Lam Dome Yai river basin with a gross area of 3,285 Km.

(2) Scope of the Study

The activities to be undertaken by the Team will be divided into two stages as follows:-

1) Pre-Feasibility Study - to conduct the overall river basin development study on the Lam Dome Yai river basin and the pre-feasibility study on the project(s) to be selected in the above-mentioned development study.

2) Feasibility Study - to conduct the feasibility study on the project assigned the highest priority to be selected in the pre-feasibility study.

2.3 Duration of the Period

18 months

3. Work Plan

3.1 Work Plan for the Pre-feasibility Study

(1) To review all existing and proposed irrigation project in the basin

(2) To evaluate the agricultural land and water resources and identify the possible reservoirs

(3) To study the basic concept for the plan of agricultural development and formulate possible irrigation projects

(4) To identify the possible projects and recommend the implementation schedule of basin development

(5) To collect and review the relevant existing data and information

(6) To survey in the project area

(7) To formulate the development plan and estimate all project requirements at the pre-feasibility level

(8) To identify the project priority

3.2 Work Plan for the Feasibility Study

- (1) To carry out additional field survey and data collection
- (2) To determine the basic items of the project planning in the field works
- (3) To formulate the integrated development plan for the project
- (4) To carry out preliminary design of the major structure of the project
- (5) To prepare the implementation schedule
- (6) To estimate the project costs and benefits
- (7) To estimate the operation and maintenance costs including administrative budget, equipment and material cost for the project
- (8) To evaluate the project
- (9) To conduct a study on the environmental impact of the proposed project according to the NEB's guidelines
- (10) Recommendation

4. Assistance Requested

4.1 Expert name of specialist	No. of person	<u>man-month</u>		
		Thailand	Japan	Total
1. Team leader	1	5.5	3.5	9.0
2. Hydrologist	1	3.5	2.0	5.5
3. Geologist	1	3.5	1.5	5.0
4. Electrical Eng	1	2.5	1.5	4.0
5. Dam Eng	1	4.0	2.5	6.5
6. Irrigation/Drainage Eng	1	5.5	3.5	9.0
7. Survey/Design Eng (A)	1	4.0	1.5	5.5
8. Survey/Design Eng (B)	1	3.0	1.5	4.5
9. Agronomist	1	4.0	1.5	5.5
10. Agro-economist	1	3.0	2.0	5.0
11. Mechanical Eng (Pump)	1	2.0	1.0	3.0
12. Soil Scientist	1	3.0	1.5	4.5
13. Environmental Expert	1	2.0	1.0	3.0
Total		45.5	24.5	70.0

4.2 Fellowship

It is proposed that the Japanese Government shall receive RID personnel connected with the study for technical training in Japan in accordance with the normal procedure under the Colombo Plan Technical Cooperation Scheme.

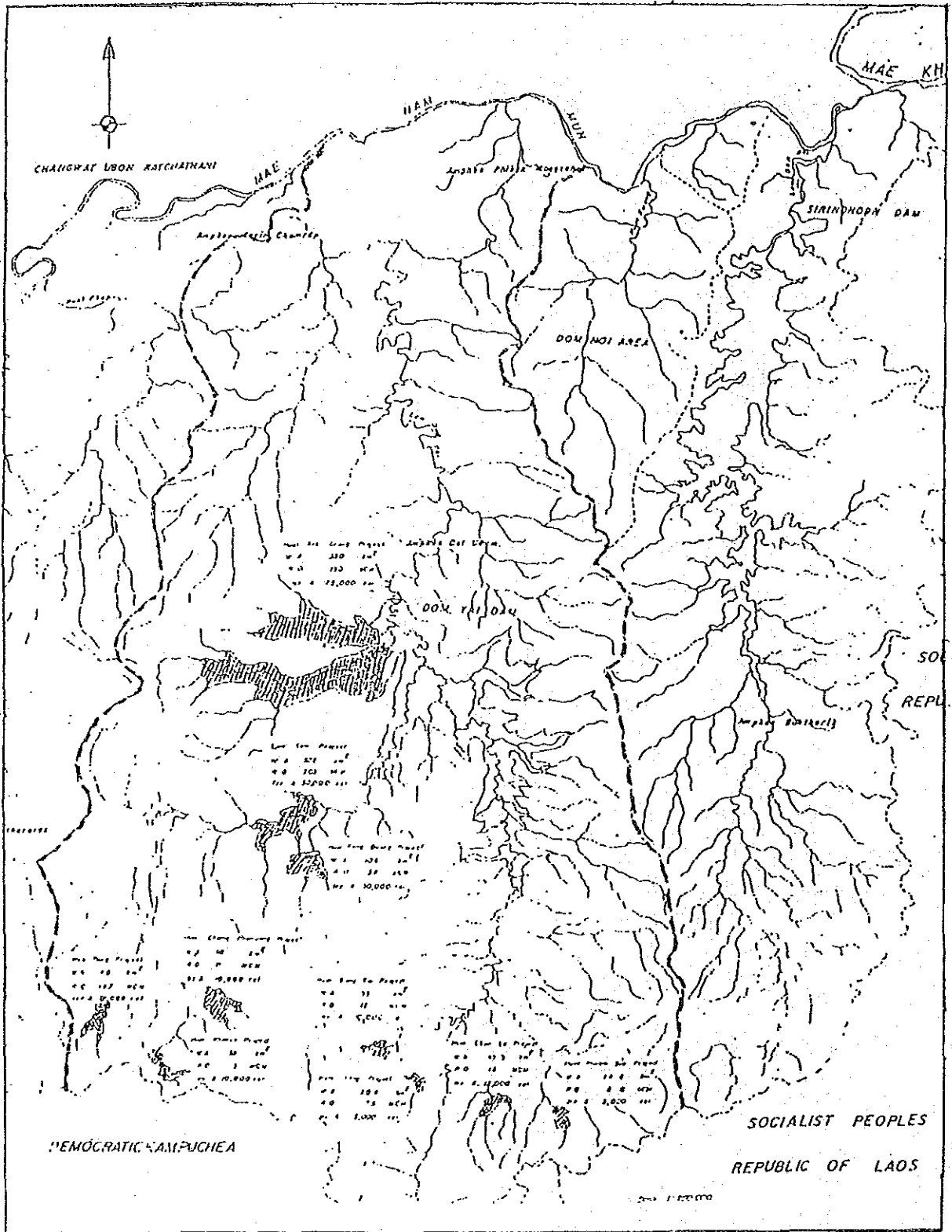
Counterpart Contribution

RID will provide the necessary and qualified staff as it is available to the experts during the work undertaken.

Prepared by : Project Planning Division
Royal Irrigation Department
Tel : 241-3354
March 1986

LOCATION MAP

(LAM DOME YAI BASIN IRRIGATION PROJECT)



2. 実施細則 (S/W)

SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE LAM DOME YAI BASIN IRRIGATION PROJECT
IN
THE KINGDOM OF THAILAND

AGREED UPON BETWEEN
ROYAL IRRIGATION DEPARTMENT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK,
DECEMBER 18, 1990

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MR. LECK JINDASANGUAN
DIRECTOR GENERAL
ROYAL IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE
AND COOPERATIVES

K. Nakashima

MR. KENJIRO NAKASHIMA
LEADER
PRELIMINARY SURVEY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

I. INTRODUCTION

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to implement the Feasibility Study on the Lam Dome Yai Basin Irrigation Project (hereinafter referred to as "the Study") within the general framework of technical cooperation between Japan and Thailand, which is set forth in the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on November 5, 1981.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in accordance with the relevant laws and regulations in force in Japan and in close cooperation with the authorities of Thailand.

Royal Irrigation Department (hereinafter referred to as "RID") shall act as counterpart agency to the Japanese Study Team (hereinafter referred to as "the Team") and also as coordinating body in relation with other relevant organizations for the smooth implementation of the Study.

The present document sets forth the Scope of Work for the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are :

1. to formulate an overall agricultural development plan for the Lam Dome Yai Basin area and to carry out feasibility study on selected priority project(s);
2. to pursue transfer of technology to the Thai counterpart personnel in the course of the Study.

III. OUTLINE OF THE STUDY

1. Study Area

The Study Area covers Lam Dome Yai basin, with a total area of about 3,285 km², located in Ubon Ratchathani and Si Sa Ket Provinces in the Northeast Region.

2. Scope of the Study

The Study will be composed of the following two(2) phases.

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A. Phase I - Overall Basin Study, consisting of:

- 1) Collection, review and analysis of relevant existing data and information with regard to the basin area, including;
 - a. natural conditions (topography, meteorology, hydrology, geology, pedology, water quality),
 - b. social and economic conditions (regional socio-economy, national and regional development programs, social infrastructure),
 - c. agricultural conditions (land use, vegetation, cropping pattern, agricultural yield / production, irrigation and drainage, water use and management, water right, farming practices, agro-economy, land tenure, processing, marketing, agricultural organizations and supporting services),
 - d. others (construction materials, environment, etc.).
- 2) Conduct of field survey on such items including those mentioned above as deemed necessary.
- 3) Review of existing and under-study irrigation development projects in the basin.
- 4) Identification and evaluation of development potentials of water and land resources in the basin.
- 5) Formulation of an overall agricultural development plan and selection of priority project(s).

B. Phase II - Feasibility study, on selected priority project(s), including:

- 1) Supplementary data and information collection and conduct of detailed survey as required.
- 2) Formulation of an irrigated agricultural development plan consisting of;
 - a. land use, cropping pattern and farming system development plan,
 - b. irrigation and drainage development plan,
 - c. agricultural organizations and supporting services development plan,
 - d. preliminary design of irrigation and drainage facilities,
 - e. project implementation schedule,
 - f. operation and maintenance plan.

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- 3) Estimation of project cost and benefit.
- 4) Project evaluation, including environmental impact study.
- 5) Recommendations.

IV. WORK SCHEDULE

The Study will be executed in accordance with the tentative work schedule as shown in Annex I.

V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of the Kingdom of Thailand.

(1) Inception Report

Twenty (20) copies at the commencement of the Phase I Study.

(2) Progress Report (I)

Twenty (20) copies at the end of the field work of the Phase I Study.

(3) Interim Report

Twenty (20) copies at the end of the Phase I Study.

(4) Progress Report (II)

Twenty (20) copies at the end of the field work of the Phase II Study.

(5) Draft Final Report

Twenty (20) copies at the end of the Phase II Study.
The Government of the Kingdom of Thailand shall provide its comments on the Draft Final Report to JICA within one (1) month after the receipt of the Draft Final Report.

(6) Final Report

Eighty (80) copies within two (2) months after receipt of the comments of the Government of the Kingdom of Thailand on the Draft Final Report.

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VI. UNDERTAKING OF THE GOVERNMENT OF THE KINGDOM OF THAILAND

1. In accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand dated November 5, 1981, the Government of the Kingdom of Thailand shall accord benefits to the Team as follows:

(1) to permit the members of the Team to enter, leave and sojourn in Thailand for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees;

(2) to exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought into Thailand for the conduct of the Study;

(3) to exempt the members of the Team from income taxes and charges of any kind imposed on or in connection with any emolument or allowance paid to the members of the Team for their services in connection with the implementation of the Study; and,

(4) to bear claim, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

2. To facilitate smooth conduct of the Study, RID shall take necessary measures in cooperation with other relevant organizations:

(1) to secure permission for entry into private properties or restricted areas for the conduct of the Study;

(2) to secure permission for The Team to take all data and documents related to the Study out of Thailand to Japan;

(3) to provide the medical services as needed (its expenses will be chargeable on members of the Team); and,

(4) to ensure the safety of the members of the Team when and as it is required in the course of the Study.

3. RID shall, at its own expense, provide the Team with the following:

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- (1) available data and information related to the Study;
- (2) additional survey related to the Study, if necessary;
- (3) counterpart personnel;
- (4) suitable office space with necessary equipment and furniture in Bangkok and the project site;
- (5) appropriate number of vehicles with drivers in the project site; and,
- (6) credentials or identification cards.

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take following measures:

- (1) to dispatch, as its own expense, the Team to Thailand; and,
- (2) to pursue technology transfer to Thai counterpart personnel in the course of the Study.

VIII. OTHERS

JICA and RID shall consult with each other in respect of any matter that may arise from or in connection with the Study.

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(Annex 1)

TENTATIVE WORK SCHEDULE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Field Work in Thailand																				
Home Office Work in Japan																				
Submission of Reports	Δ IC/R			Δ P/R(I)		Δ IT/R					Δ P/R(II)			Δ DF/R				Δ F/R		
	←----->										←----->									
	Phase I Study (Overall Basin Study)										Phase II Study (F/S)									

(Note) IC/R : Inception Report (I)
P/R(I) : Progress Report (I)
IT/R : Interim Report
P/R(II) : Progress Report (II)
DF/R : Draft Final Report
F/R : Final Report

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3. 協議議事録 (M/M)

MINUTES OF MEETING
OF
THE PRELIMINARY SURVEY
FOR
THE FEASIBILITY STUDY
ON
THE LAM DOME YAI BASIN IRRIGATION PROJECT
IN
THE KINGDOM OF THAILAND

AGREED UPON BETWEEN
ROYAL IRRIGATION DEPARTMENT

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK,

DECEMBER 18, 1990

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MR. LECK JINDASANGUAN
DIRECTOR GENERAL
ROYAL IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE
AND COOPERATIVES

K. Nakashima

MR. KENJIRO NAKASHIMA
LEADER
PRELIMINARY SURVEY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan dispatched, through Japan International Cooperation Agency, to Thailand the Preliminary Survey Team for the Feasibility Study on the Lam Dome Yai Basin Irrigation Project (hereinafter referred to as "the Study"), headed by Mr. Kenjiro Nakashima, from December 9 to 19, 1990.

The Preliminary Survey Team and Thai officials concerned of Royal Irrigation Department (hereinafter referred to as "RID"), MOAC, had a series of discussions and exchanged their views on the Scope of Work for the Study (list of attendants as per attached).

As a result of the discussions, both sides came to an agreement on the Scope of Work, which was signed and exchanged on December 18, 1990.

The salient results of the discussions are as follows.

1. Both sides agreed that only medium and large scale irrigation projects shall be studied in the Study, and that the number of projects to be examined at the level of Feasibility Study shall be one (1) or two (2), depending on the size of the project.
2. RID requested that, in undertaking the Study, due consideration shall be paid to existing water rights in the Study area, especially those at the downstream of proposed project areas.

RID shall take necessary arrangements and coordination to provide necessary information as to existing and future water requirement of water resources development and utilization undertakings by those authorities and organizations other than RID.

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3. Both sides confirmed that RID shall prepare necessary information on the environmental aspect of projects, if necessary, both in Phase I and Phase II of the Study.
4. RID requested that executive summary both in English and Thai language be included in the Final Report of the Study. Japanese side took note of such request.
5. Both sides confirmed that RID shall undertake following field surveys and analysis in connection with the Study :
 - (1) Topographic mapping (scale: 1: 15,000) at several potential dam sites and reservoir areas for Phase I Study ;
 - (2) Topographic mapping (scale: 1: 10,000) of selected project area(s) and topographic survey (scale: 1: 4,000) at selected dam site(s) for Phase II Study ;
 - (3) Boring at selected dam site(s) and other geological surveys for Phase II Study ; and,
 - (4) Soil analysis.
6. RID requested that two (2) sets of personal computer be provide by the Japanese side in connection with the implementation of the Study. Japanese side took note of such request.
7. RID requested that technical training in Japan be given to the counterpart personnel of the Study. Japanese side took note of such request.

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LIST OF ATTENDANTS

Thai Side

Mr. Maitri Poolsup	Director of Project Planning Division (PPD), RID
Mr. Suthi Songvoravit	Chief Engineer, Section 1, PPD, RID
Mr. Chat Sarikaphuti	Director of Regional Irrigation Office V, RID
Mr. Suppakiat Oransathien	Chief of Preliminary Project Consideration Section, Regional Irrigation Office V, RID
Mr. Suwit Thanopanuvat	Water Resource Engineer, Section 1, PPD, RID
Ms. Chavee Wongprasitiporn	Irrigation Engineer, Section 1, PPD, RID
Mr. Fumio Araki	JICA Expert, Operation and Maintenance Division, RID
Mr. Hideshiro Kikuchi	JICA Expert, PPD, RID

Japanese side

Mr. Kenjiro Nakashima	Leader of JICA Preliminary Survey Team
Mr. Nariaki Tamura	Member of JICA Preliminary Survey Team
Mr. Tomoyoshi Fukumorita	Member of JICA Preliminary Survey Team
Mr. Atsushi Hanatani	Member of JICA Preliminary Survey Team

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4. 収集資料リスト

(資料名)	(入手先, 発行機関)
1. Dom Yai River Basin Development Project 一般計画平面図 (1/50,000)	RID
2. 既存及び計画 SSIP 及び MSIP 位置図 (1/50,000)	RID
3. Climatlogical Data for the Perlod 1956~1985	Meteorological Department Ministry of Communications
4. M-80 月別流量データ (1965~1988)	RID
5. Review on Groundwater Development in the Northeastern Thailand	Department of Mineral Resources
6-1 Report of Water Resource Development on Phanom Dong Rek Area Huai Luang Reservoir Project	RID
-2 Huai Bon Reservoir Project	RID
-3 Huai Khanun Reservoir Project	RID
7. タイ国経極概況 (1988~89年版)	バンコク日本人商工会議所
8. Statistical Report of Changwat (Ubon Ratchathani)	National Statistical Office, Office of the Prime Minister
9. 同 上 (Si Sa Ket)	"
10. Population & Housing Census 1980 (Changwat Ubon Ratchathani)	"
11. 同 上 (Si Sa Ket)	"
12. The Sixth National Economic and Social Development Plan (1987~1991), (Summary)	National Economic and Social Development Board, Office of the Prime Minister

(資料名)

(入手先, 発行機関)

13. Gross Regional and Provincial
Product

"

14. Agricultural Statistics of Thailand,
Crop Year 1988/89.

Center for Agricultural
Statistics, Office of
Agricultural Economics,
Ministry of Agriculture
& Co-operatives.

15. ウボン・ラチャタニ市の気象データ

RID

JICA