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TO - **AID/W TOAID A 260**

FROM - **VIENTIANE**

SUBJECT - **Non-Capital Project Paper (PROP)**

REFERENCE - (A) **Vientiane 1254**  
(B) **TOAID A-529, dated 8/1/69**

COUNTRY **Laos**

PROJECT NO. **439-11-190-065**

Submission Date **May 4, 1970** Original \_\_\_\_\_ Revision No. **1**

PROJECT TITLE: **Agriculture Development**

U. S. OBLIGATION SPAN: **FY 64 THROUGH FY 79**

PHYSICAL IMPLEMENTATION SPAN: **FY 64 THROUGH FY 79**

**GROSS LIFE-OF-PROJECT FINANCIAL REQUIREMENTS:**

U.S. Dollars	\$34,783,500
U.S.- owned Local Currency	3,014,400
Cooperating Country Cash Contribution	<del>2,772,400</del>
Other Donor	6,004,000

<b>Totals</b>	<b>\$46,575,300</b>
	<del>\$46,255,300</del>

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DRAEATED BY <b>L. H. Rasmussen</b> <b>R. E. Leubis, imp:ls</b>	OFFICE <b>AGR</b>	PHONE NO. <b>2400</b>	DATE <b>5/14/70</b>	APPROVED BY <b>Charles A. Mann, Director</b>
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AD/PE: **CRamsey** AD/FIN: **CCChristian** **UNCLASSIFIED**  
 DD: **JBChandler** **ESD-1, CLR-3**

## I. SUMMARY DESCRIPTION

### A. General

The military conflict, which has dominated life in Laos for more than a decade, has brought into existence new production and marketing patterns for rice, for other major foodstuffs and for fibres. These changes, which have been accompanied by significant shifts in the distribution of the population, created local areas of rice deficit that cannot be economically supplied from the insular zones of over production within the country.

In recent years the population movement has been away from the rice paddy and into occupations which are agriculturally non-productive. The capital city, Vientiane which is said to have contained a population of 20,000 in 1954 counts about 170,000 inhabitants in 1970. In addition to increased organizations, there has been heavy military conscription of rural manpower with the resulting decrease in area of land planted to rice. Thousands of residents of the mountainous area have been forced by the war to frequently relocate and have therefore been prevented from producing their own basic food requirements.

The occupational distribution referred to above and the dislocation of the population has changed the essentially subsistence model of agricultural production. In 1950 approximately 90% of the population produced their own food. Today no more than 60% of the people in the RLG held areas of Laos produce the food to feed themselves. Such a supply and demand situation should theoretically increase the demand for Lao farm products, strengthen farm prices and result in increased agricultural production. Due largely to the absence of a marketing infrastructure, geographical barriers to transportation, insecurity, and the lack of adequate communications and transportation the urban demand for food has been satisfied primarily by increased imports from Thailand and only minimally through the effectual increase in demand for Lao agricultural products.

**These imports require the expenditure of an estimated \$4.5 million in foreign exchange for rice alone each year outside of the costs of the special food programs for the feeding of military personnel, and refugees.**

**In the classic model, occupational shifts in the population are generated by changing economic circumstances and the redistribution of the income. In Laos, where the economy has been dominated by the war, the monetizing of the rural economy has only begun to take place and the increase in employment has been in government, in the military and in other, non-agricultural productive, activities.**

#### **B. THE FOOD DEFICIT**

**Caps between aggregate national production and consumption exist for nearly every category of consumable - rice - other cereals, fish, meat, vegetables and fruit but marketing zones differ from each other in the types and amounts of foods produced. As previously stated food deficits are primarily filled by imports, largely from Thailand. The Lao Government maintains a record of all commodities imported by volume and value but these statistics are incomplete since a large percentage of the unprocessed food imports take place as small unrecorded transactions between Lao and Thai traders operating along the Mekong river.**

**Rice, as the dietary staple and the principal food import of Laos remains the central focus of USAID and RLG Agriculture production efforts.**

**In marketing zones where rice production exceeds requirements, such as in the Pakse area, program emphasis is being directed toward the reduction of unit production costs and marketing of foodstuffs common to the Lao diet and currently imported from Thailand. Diversification is being approached cautiously through the identification of those commodities already in demand and considered capable of being produced at competitive prices.**

Diversification necessitates the reduction of unit production costs to competitive levels and the development of marketing facilities capable of moving the commodity from the producer to the consumer before import substitution can effectively take place. While import substitution is our immediate target the improvement of the Lao diet must also take place. A recent nutritional survey indicates that the Lao diet is generally deficient in riboflavin and vitamin A and somewhat deficient in caloric intake, protein, thiamine and vitamin C. The inadequate Laotian diet clearly manifests itself in the retarded growth of children, mental inactivity, reduced physical activity and low resistance to disease. In response to a need for a more adequate diet where demand for certain foods will have to be created USAID is continuing projects aimed at increasing the availability of fresh water fish; augmenting swine production in the Vientiane area; and encouraging the establishment of fruit trees, and pasture plantings. The RLC/USAID Extension Home Economics Staff conducts training and demonstration sessions covering such items as the basic principles of nutrition and methods of preparing high-nutrition foods.

### C. RICE PRODUCTION

The territory under RLC control has a population estimated at about 2.0 million but both area and population changes with the military situation. Over the past five years this area has produced between 320 and 350 thousand metric tons of milled rice annually. Consumption requirements are estimated at slightly more than 400,000 tons, leaving an average annual deficit of 60 to 80 thousand metric tons, depending upon the climate of the particular crop year, number of refugees dislocated, and the proportion of the population in RLC controlled territory.

The estimated aggregate FY'68 deficit amounted to approximately 75,000 metric tons of rice. Fortunately the country experienced reasonably good rice growing weather during the 1969 wet season, resulting in production increases of up to 20% in some areas.

**Overall production figures for the past three years are:**

1967 = 290,000  
1968 = 326,000  
1969 = 335,000

**Because of the lack of security, the isolation of the rice marketing areas, and the high cost of transportation, aggregate production and consumption estimates are inadequate as an index to the Laos rice deficit problem.**

**Laos is composed of eight major rice producing and marketing zones (see Table A). Each of these areas has its own supply and demand equilibrium, virtually independent of the other production zones. While these zones tend to be insular insofar as Laos is concerned, those that are immediately adjacent to Thailand are more directly affected by Thai rice prices and supplies than by adjacent Lao marketing areas.**

**The five southernmost provinces comprise the major surplus rice production area. Khammouane and Savannakhet provinces are self-sufficient in normal rice growing years. The major need and demand for rice is in the provinces of Vientiane and Luang Prabang. The fact is that this need cannot be economically met at this time by internal flow from surplus areas, requires abandonment of the preoccupation with aggregate yields and concentration on the ways and means of increasing production in the deficit areas, primarily on the Vientiane Plain.**

**Table A gives an estimate of population, production, consumption and resulting surplus or deficit for the eight major areas under the control of the RLG.**

Table A  
1969

ESTIMATED POPULATION, RICE CONSUMPTION & RICE PRODUCTION IN RIC CONTROLLED AREA IN LAOS

<u>Location</u>	<u>Population</u>	<u>Estimated Consumption</u> <sup>1/</sup>	<u>Estimated Production</u> <sup>2/</sup>			<u>Surplus or Deficit M/T of Milled Rice</u>
		<u>Est. Con. M/T of Milled Rice</u>	<u>Hectares Under Cultivation</u> <sup>3/</sup>	<u>M/T Paddy</u>	<u>M/T Milled</u>	
<u>South</u>						
Khammouane <sup>h/</sup>	135,450	28,715	21,826	26,272	16,289	- 12,426
Savannakhet <sup>h/</sup>	358,683	76,041	81,950	101,967	63,220	- 12,821
Pakse	643,075	136,332	226,176	291,492	180,725	+ 44,393
<u>Central</u>						
Vientiane	319,247	67,680	41,623	48,026	29,776	- 37,904
Borikhane	45,990	9,750	9,525	9,600	5,952	- 3,798
Xieng Khouang <sup>h/</sup>	170,847	36,220	14,101	13,211	8,191	- 28,029
<u>North</u>						
Sayaboury <sup>h/</sup>	115,832	24,556	26,900	27,040	17,000	- 7,556
Luang Prabang	70,000	14,840	9,625	13,593	8,428	- 6,412
Houa Khong	65,312	13,846	6,200	10,200	6,324	- 7,522
<b>Total</b>	<b>1,924,436</b>	<b>407,980</b>	<b>437,926</b>	<b>541,401</b>	<b>335,905</b>	<b>- 72,075</b>

<sup>1/</sup> Based on the Nutritional Survey of Six Lao Villages, 1969. Calculated at 212 kilograms of milled rice per person. This figure includes estimates for rice actually consumed, storage loss of 15%, alcohol production, rice noodles, but not a carryover which normally would be considered.

<sup>2/</sup> Derived from estimates made by RIC provincial chiefs of Agriculture and USAID/Agriculture Area Advisors <sup>h/</sup>, January 1970.

<sup>3/</sup> Includes both lowland and upland rice.

Continued

Table A - Continued

1/ The data presented in Table A represents the production and consumption rate during the second quarter of FY 1970 as estimated by USAID and RIG field personnel. Since these estimates were made shifts in both land area and population under RIG control have taken place with most of Xieng Khouang Province now under Communist control. Approximately 25,000 refugees from Xieng Khouang Province have been relocated in other provinces in recent months thus shifting population figures. However, in the aggregate there has been relatively little change in the population under RIG control even though land area has changed. Virtually all of the present population of Xieng Khouang province under RIG control are not self-sufficient in rice production. Once these persons are effectively relocated it is assumed that self-sufficiency will again be possible thus reducing the national rice deficit by about 30,000 tons of milled rice as shown in Table A.

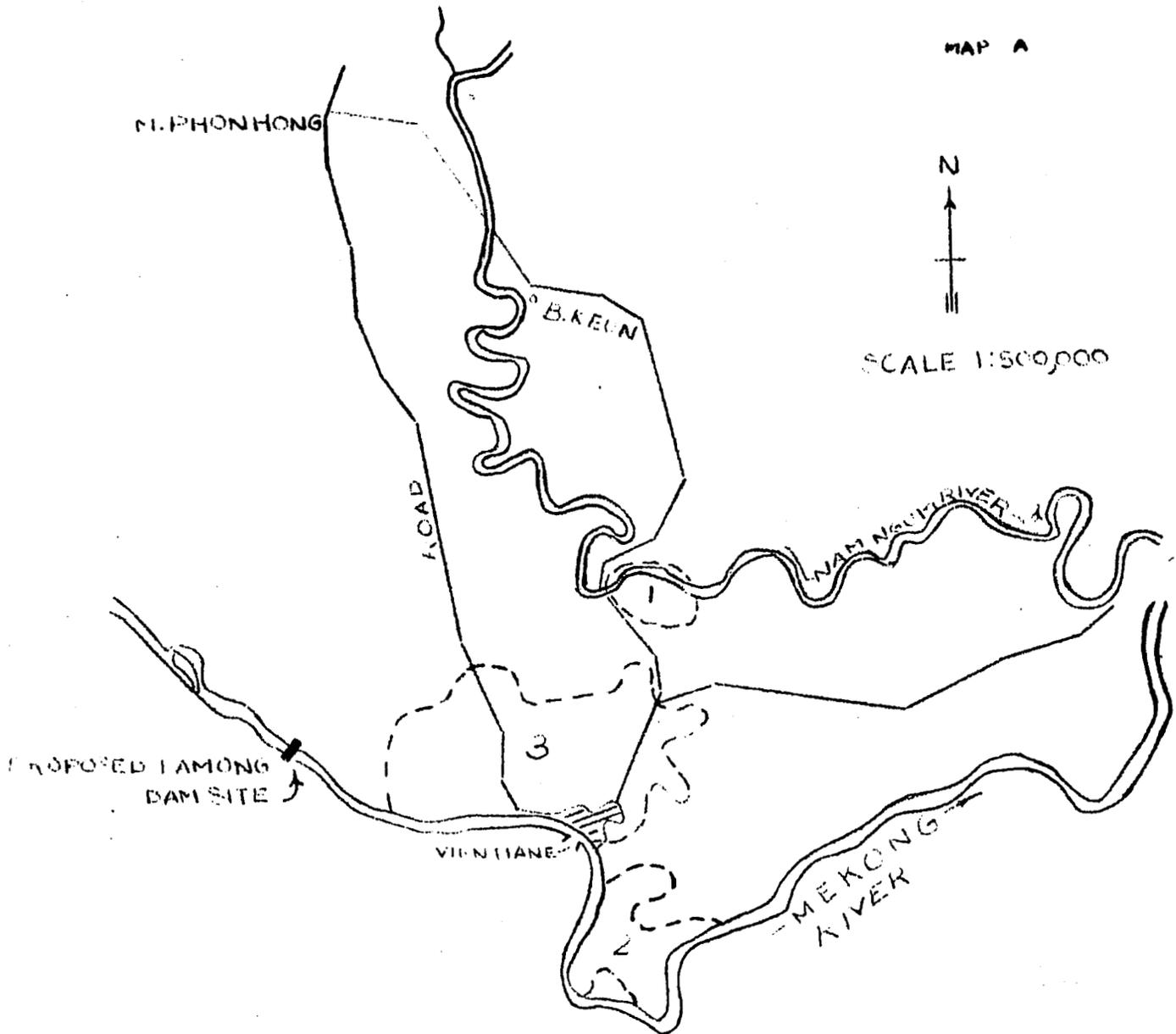
There may be a tendency for provincial personnel to under estimate production and the percent of self-sufficiency. For example, in Khammouane and Savannakhet Provinces the percent of self-sufficiency in rice production is thought to be higher than indicated in Table A and close to the self-sufficiency level. The data presented for Sayaboury area is somewhat misleading in that the central and northern parts of the province are self-sufficient at present and possess a great potential to increased rice production given markets. The southern portion of the province is deficit in rice production thus indicating that the province as a whole is deficit which is not true.

## D. CONCENTRATION IN DEFICIT AREAS

### 1. The Vientiane Plain

There are approximately 1 1/2 million hectares in Vientiane Province of which about 600,000 are considered in the Plain area. Slightly over 40,000 hectares (which includes both lowland and upland crops) are now being cropped with about 30,000 hectares devoted to wet season paddy production. Some of the land on the Plain is known to be non-arable for reasons of salinity, wetness, undulating topography or pooriness of soils. A recent study published by the Asian Development Bank suggests that as much as 50,000 hectares could be developed into paddy land on the Plain. The amount of land which could eventually be placed in production of food producing crops is unknown for the lack of sufficient survey and soils information. A cursory estimate of the production potential indicates that perhaps as much as 200,000 hectares could eventually be developed for the production of food producing crops on the Plain given sufficient resources and manpower. At the present time one of the limiting factors to increased production on the Plain is the lack of manpower and mechanization. Also, the present size of the population of Vientiane province obviously does not warrant cultivation of this magnitude.

As the first step toward concentrating production efforts on the Vientiane Plain, two priority areas adjacent to Vientiane City and totalling approximately 22,500 hectares were selected for a saturation program during the 1969 wet season. These areas, designated as priority areas A and B (on Map B. ~~Section IX~~) were selected because of their accessibility, their relatively good soils, and the apparent progressive characteristics of the farmer population. RLG and Agriculture Development Organization agents concentrated their efforts in these areas to promote fertilizer usage, assure that the most productive cultivation techniques were being employed and to maintain the necessary market outlets for increased production. Extensive flooding in this area in August, 1969, totally destroyed the crop on approximately 3,000 hectares of the priority areas, but even so, production increased by nearly 6% over 1968. USAID has calculated



BLOCK	AREA (HA)
1	500
2	5000
3	10,000

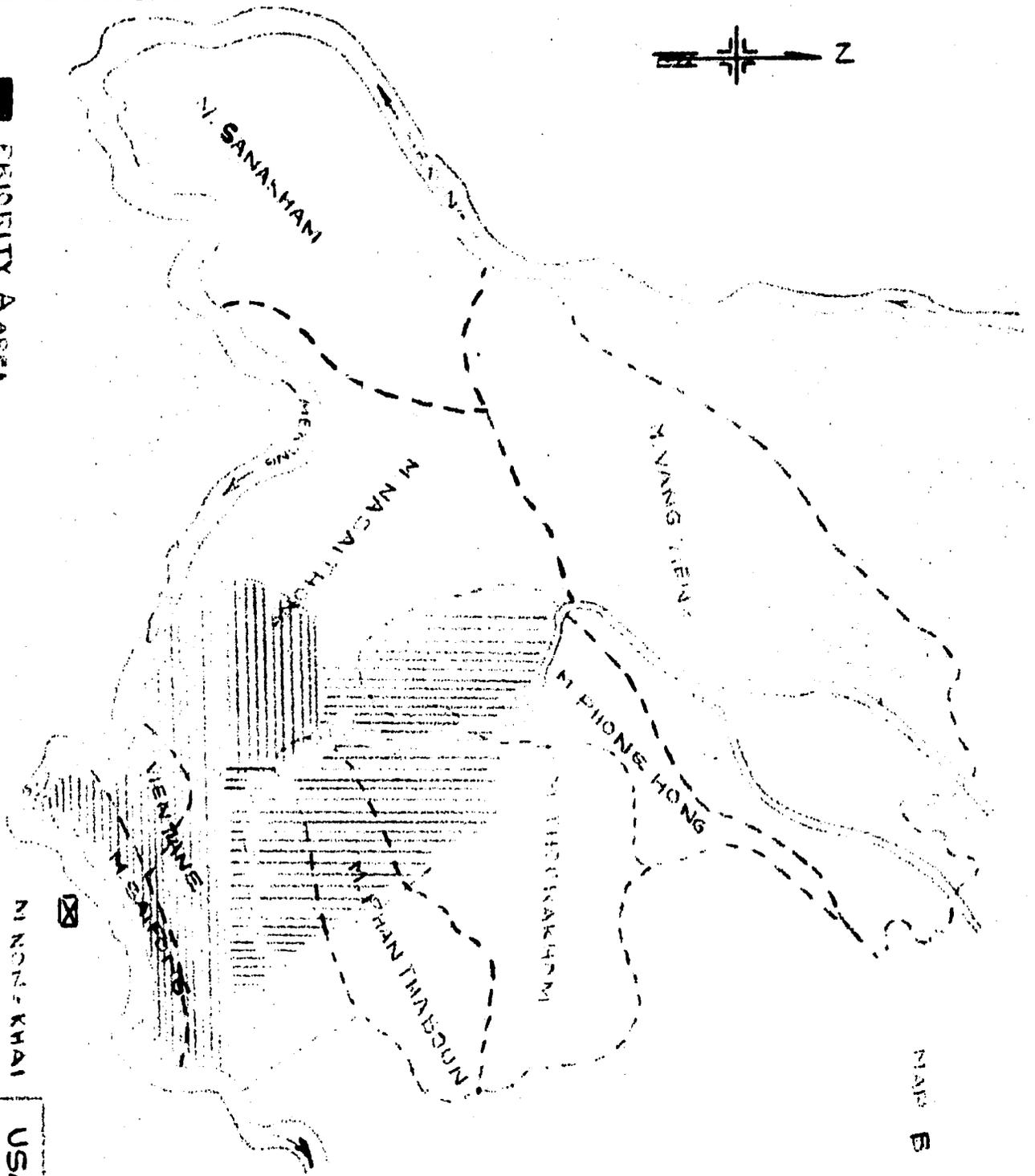
1 - The Ng... (Study Area)  
 2 - Hat Dok Keo  
 3 - Kuo Line (Study Area)

Area of the map is made in units of 1:500,000



 PRIORITY A AREA  
 PRIORITY B AREA  
 UZD = A+B

SCALE 1:500,000



MAP B

USAID/LAOS  
 ASR/IRR  
 VIENTIANE  
 PROVINCE

that if the flooding had not occurred, total production increases would have been approximately 15% over the 1968 yields.

We now believe that self-sufficiency in rice for this area can be attained through an aggressive fertilizer sales program and an intensive agriculture extension program. Outlets for the sale of fertilizer and seed have been established at nine field locations on the Vientiane Plain, and a limited number of farm to market roads are being improved to an all-weather status.

Based on field trials and farm demonstrations it is evident that production can be increased by 20% through the use of fertilizers on native varieties. Table B column (6) reflects gradually increasing yields as more farmers apply increasing amounts of fertilizers to both native<sup>and</sup> improved rice varieties. The introduction and acceptance of other improved practices such as the use of improved seed, use of insecticides, weeding, rodent control and water management increase yields well above the current national average of 0.7 tons milled rice per hectare.

and  
The use of fertilizer/insecticides in combination with improved seed has been encouraging but the rate of fertilizer and insecticide applications have been below recommended levels for optimum production. This has been due largely to the fact that inputs have not been available from ADO in the kit or package form. Beginning with the wet season 1970, one-tenth hectare kits containing all of the biological inputs necessary for optimum production will be available and farmers will be encouraged to purchase their inputs in this form. For 1970 we have established the goal of 3,500 hectares of high yielding rice, representing a 400% increase over 1969.

One interesting aspect with regard to varieties is the fact that 8,000 M/T of the Vientiane deficit is from white rice and that there is evidence that the consumption of white rice in the city seems to be growing proportionately faster than consumption of glutinous varieties. In selecting varieties for distribution, this factor will be taken into careful account.

**TABLE: B** Production Goals - Vientiane Plain - 1969 (actual) through Calendar Year 1973

12	Dry Season				Wet Season			Annual Consumption	Annual Deficit
	Calendar Year	Number of Hectares	Average Yield M/T Milled Rice	Production M/T Milled Rice	Number of Hectares	Average Yield M/T Milled Rice	Total Yield M/T Milled Rice		
UNCLASSIFIED	1969	320	1.6	834	<sup>1/</sup> 10,798 b) 825	0.7 1.4	28,558 1,155	73,425	- 42,878
	1970	438	1.8	788	a) 38,123 b) 3,500	0.9 1.6	34,310 5,600	75,600	- 34,902
	1971	600	1.8	1,080	a) 37,039 <sup>1/</sup> b) 5,000	1.0 1.7	37,039 8,500	77,900	- 31,281
	1972	900	1.8	1,620	a) 32,880 b) 10,000	1.0 1.7	32,880 17,000	80,250	- 28,750
	1973	1,700 <sup>2/</sup>	1.8	3,060	a) 34,166 b) 10,000	1.2 1.9	40,999 19,000	82,400	- 19,341

<sup>1/</sup> a) represents native varieties of the indica type b) is limited to new improved varieties, with full recommend fertilizer and insecticide, presently IR-253, C-463, IR-20 and IR-22.

<sup>2/</sup> We believe it is unrealistic to assume that more than 25% of the farmers on the Vientiane Plain will use fertilizers and improved seed in harmony during next five years. Gradual yield increases however will accrue as farmers learn better ways to use fertilizer and as more farmers use fertilizers on un-improved varieties.

<sup>3/</sup> The Ngon Project in production (800 ha.)

<sup>4/</sup> It is assumed that the total amount of land in rice production will increase. This increase is calculated at 1% in 1971, 2% in 1972 and 3% in 1973.

The further development of large scale irrigation projects no longer appears necessary to reach the principal goal of rice self-sufficiency. The preliminary draft of a feasibility survey for Khao Liao covering 10,000 hectares North of Vientiane City has been received (Map A Block 3) and the cost/benefit ratio at the assumed input/output seems favorable. During the past twelve months the Asian Development Bank has approved a loan to RIG for the construction of an 800 hectare irrigation system at Tha Ngon (Map A Block 1), and interest continues to run high among other donors in the eventual installation of a 5,000 hectare irrigation works for Hot Dak Keo (Map A Block 2). The assumption that self sufficiency can be attained from wet season yields gives considerably less urgency to the Khao Liao project. It would be desirable to continue work on this project through the design stage which, if at some future date the RIG should choose to develop the Khao Liao area, would provide the basic data necessary to proceed with the project in an expeditious manner. As the current USAID policy and strategy unfolds, and if it is found that the assumption about wet season production is too optimistic, we would propose implementation of the design phase and consideration of participating in the construction phase of the Khao Liao project. Against this possibility, we have programmed over a 3-year period for a PASA with BuRec beginning in FY 72. These costs are proposed as additional to what we now consider our basic programming needs in the Agriculture Development Project.

## 2. THE NORTHERN REGION

In an effort to reduce the rice deficit in Luang Prabang province, the Nam Tan Irrigation project was undertaken in FY'68. Construction on the left bank of the project was completed in January, 1970, and the completion date for the total project is planned for the dry season 1970-1971. When completed, the system provides for the irrigation of 3,000 hectares during the wet season and 1000 hectares during the dry season. The project is designed to yield up to 12,000 metric tons of rice or an equivalent quantity of crops other than rice, annually. While the lack of security and the weak marketing structure are overriding factors affecting the distribution of eventual yields, Central Sayaboury Province, where the Nam Tan project is located, is linked by the Mekong river with Luang Prabang and the City of Vientiane. It is anticipated that in the immediate future nearly all of the surplus yield can be directed towards Luang Prabang.

The non-availability of arable land limits the productive capacity of the area immediately adjacent to the two Northern urban centers of Luang Prabang and Ban Houei Sai. However, the mountainous topography lends itself ideally to the construction of village sized gravity flow irrigation systems. This type of project has been unusually successful in stimulating rural populations to help themselves through an input of self-help labor, and the villagers have been readily organized into associations for the operation and maintenance of the canal system. In many areas similar projects have unusual utility for the establishment of homogenous groups of refugees into their communal patterns. The relatively low cost of these projects and their favorable acceptance by farmers and RLC administrators make them extremely desirable projects from both agriculture and community development points of view.

#### E. OPERATIONS OUTSIDE OF THE DEFICIT AREA:

##### The Southern Provinces

The Southern Provinces, the Pakse marketing zone, constitute the bread-basket of the kingdom and are agriculturally renowned for the wide spectrum of crops produced, including high-altitude products that are grown on the Boloven's Plateau. Although the population is double that of the Vientiane Plain, rice producers have traditionally met the market requirements of the area and have exported a surplus from time to time to adjoining marketing zones.

The Pakse marketing zone has developed over the years a reasonably effective marketing infrastructure for rice and for other selected crops as well. For this reason farmers have tended to produce farm surpluses for most of the commodities currently consumed in the zone. Only a limited amount of fruits and vegetables are imported from Thailand and this primarily at the beginning and ending portions of the growing season. In addition, a number of exportable products such as coffee, tea, fruits, and potatoes could be further developed should external demand warrant the expansion of production. Given the present demand for farm products in the Pakse area

the major program emphasis will be directed toward reducing the cost of production and improving product quality for those commodities enjoying a limited export market.

The two marketing zones south of Pakse (Savannakhet and Khammouane) do not enjoy the same degree of self-sufficiency as does Pakse nor the market infrastructure development. In years possessing good rice production weather production often exceeds consumption requirements. However, because of the limited marketing infrastructure it is often easier and less expensive to import both rice and other farm grown foodstuffs from Thailand thus reducing farmer incentives to produce beyond family requirements. Due to the fact that Lao agriculture production has been in a state of technical stagnation the cost of production tends to be higher for many farm products than for competing Thai farm products. The program emphasis in such situations therefore becomes one of reducing unit cost of production to competitive levels or below to make possible the displacement of imports and to improve the marketing infrastructure so the Lao agriculture production can be made available to Lao consumers.

The new high yielding varieties and inputs made available through the Accelerated Rice Production Program of the U AIF, beginning in 1967 were unusually successful with the farmers of the South. The increased production however, found normal marketing routes closed with the result that significant surpluses were produced in 1969. Where no markets are available the individual farmer has no choice but to drastically reduce production to subsistence level, this reduces farm income and produces sharp change in supply. In order to prevent a recurrent vicious cycle to subsistence level in suitable geographical areas U AIF entered the rice market in early 1970 and purchased local surpluses for project requirements in Vientiane at the market giving stability to both farm income and to the volume of rice produced in subsequent seasons.

Supply stability is one of the necessary conditions in building an effective marketing infrastructure.

USAID and RLG are embarking in 1970, on a program of crop diversification for this region—away from rice toward the displacement of imports and towards some new crops whose potential for Laos is large at present. Of major concern are problems relating to the soils of the area which because of their high acidity and low permeability are ideal for rice but of limited value for many potential industrial crops. During this period of reassessment of agriculture objectives for the southern provinces, it has become necessary to reappraise USAID policy on assistance to the construction of irrigation projects. Briefly, the new policy limits USAID engineering or financial assistance to projects that are clearly intended only for the production of crops other than rice. More emphasis is now placed on maintenance of existing irrigation facilities and in-country training courses which are being held for future Water Masters and Ditch Riders.

## F. SECTORIAL STRATEGIES

### 1. General

The overall goal of the Agriculture Development project is to attain self-sufficiency in the production of rice by 1975, and in the production of all major foods by the end of FY'79. Self-sufficiency in any commodity is a function of moving available supply to areas of demand, whether within or between the eight major marketing zones. Although at present it is neither economically feasible nor prudent to rapidly establish a marketing infrastructure on a national scale. The situation will necessarily change when the country is at peace. Because of current security constraints the long range outlook for each crop is being evaluated in terms of individual marketing zone sufficiency until such time as intermarketing zone marketing becomes economically feasible. In this

context, crop diversification programs are being developed to compensate for changes in supply and demand when the marketing zones are politically and economically connected again.

## 2. Irrigation

By the end of CY 1969, USAID/RLG had completed over 150 irrigation projects covering approximately 15,000 ha. At the present time there are 23 pumping projects covering 1025 hectares and the balance of the area is served by small diversions.

Earlier in this PROP two changes were described which will affect the Irrigation Program in 1970 and onward. One change concerns a 'wait-and-see' outlook as regards irrigation development of the Vientiane Plain and the other details a restrictive policy on irrigation development in the five southern provinces. A continuation of the highly successful small diversion project from Vientiane Plain - North is planned at current or expanded levels. Expansion is considered possible in view of the increasing refugee resettlement problem although potential small diversion type project sites are becoming more difficult to locate. There is a great need for the formal organization of farmers into water-user associations to provide the necessary operation and maintenance functions <sup>of</sup> existing irrigation systems. Many of the irrigation systems that were constructed four to six years ago are suffering delivery problems because of the loose and informal approach to operation and maintenance of the water source and canal system. This function of RLC Irrigation is now being strengthened through training and on-site assistance. On new projects, formal organizations are being established as the systems are built, including articles of incorporation, the election of officers and regular meetings. The task of developing an effective operation and maintenance program is large and will require continuing USAID attention and resources until such time as the RLC develops the expertise necessary to carry out this function.

### 3. ADO

The Agriculture Development Organization of Laos assists in the development of the agricultural sector of the Lao economy principally through the provision of operating loans in money or in kind; through the provision of sales by retail outlets and field agents of production increasing inputs; and through selective interventions in the rice market for farm income and supply stabilization purposes.

In FY'70 important changes in the USAID relationship to ADO were approved. In brief a move has been taken to lessen the influence of USAID with ADO and to strengthen ADO as a bona fide Lao Institution. The concept of USAID/RLC Co-Direction has been abandoned in favor of RLC Direction. A six-member administrative council has been established to carry out the policy formulation function.

Training of Lao employees has been greatly accelerated, but foreign expertise will be required for the foreseeable future to manage this institution.

ADO initiated a fertilizer sales campaign in the spring of 1967. During the first year 100 metric tons of fertilizers were sold with a market value of 4,500,000 KIP. In 1969, 2,700 metric tons of fertilizer were sold to individuals and to groups for 99 million KIP. The spectacular increase in this sales program is solid evidence of the need for ADO and its growing acceptance by Lao farmers. Loan repayments have been high (over 90%) in those areas where security has permitted normal activity.

For 1970, and beyond, ADO is concentrating its resources in the rice deficit areas as a first priority. ADO's program in areas near or exceeding the self-sufficiency level in rice production will be confined to promoting market stability, and supplying cost reducing production commodities as a part of a program to reduce the unit cost of production for all crops.

#### 4. FISH AND LIVESTOCK TARGETS

##### a) Fish Production

The Fisheries Project which was begun in 1966 aims to promote fish production in farm ponds and rice paddies. The rehabilitation of three fish hatcheries (Vientiane, Luang Prabang and Pakse) will be completed by the end of FY'71. Training is on schedule for operating personnel of the stations and annual production targets for 1972 are: 1 million fingerlings and 30 tons of marketable fish for Pakse; 1.3 million fingerlings and 30 tons of marketable fish for Vientiane, and 0.5 million fingerlings and 5 tons of marketable fish for Luang Prabang. In terms of kip value the 2.8 million fingerlings are valued at 8,400,000 KIP and the 1972 market fish production goals, if attained, should amount to 24,000,000 KIP. Assuming a 30% survival rate for fingerlings and an average harvest weight of one kilo per fish the value of increased fish production should amount to about 336,000,000 KIP (840,000 kilos). At the present time it is estimated that about 946,000 kilos of fish are annually imported into Laos or about 25% of the fish consumed in RLC held territory.

The 65 tons of marketable fish cited above refers to fish that are produced at the stations and sold for consumption in adjoining markets. The proceeds from these sales plus a modest charge for the fingerlings are designed to support the operation and maintenance costs of the individual stations. The contract with U. S. Consultants Incorporated is planned to be phased out at the end of March 1972.

##### b) Livestock

A limited livestock program under the direction of a TCN livestock specialist began in FY'70. The goal of the sub-project is to increase pork production in the Vientiane area, and to assist the RLC veterinary service to attain a capacity to fabricate certain necessary animal vaccines.

The pork project calls for the formation of a producers cooperative (this has been accomplished) as one step to increase pig production from the present level of 8,000 head to 44,000 head in 1975. An ancillary program of corn production for swine feed is underway in cooperation with the Israeli Technical Assistance Mission. Principal efforts to be stressed <sup>are</sup> an improvement of animal hygiene, provision of new high standard pig-raising facilities, and continuation and expansion of the feed and forage program. Progress to date is satisfactory.

The vaccine element of this project continues the USAID practice of furnishing certain critical animal vaccines until RLC can either produce them - or establish a revolving fund from the sale of vaccines which have been donated, which will be used for future purchases. In fact both solutions are in the course of development. FAO has nominated a Doctor of Veterinary Medicine, a specialist in virology, for the vaccine program of the Veterinary Service. He will arrive in Laos in June, 1970. USAID has purchased and will make available upon arrival of the FAO technician, laboratory equipment and chemicals to produce vaccine for Fowl Pox, Newcastle Disease, Hog Cholera and Rabies.

##### 5. EXTENSION

The Extension program places its principal emphasis on the dissemination of information, demonstrations and training in the Vientiane Plain area. It is also upgrading the technical capabilities of the RLC Extension Agents through an in-service training program and farmers through farmer leader training. During FY70 all 115 Extension agents and 45 Home Economics agents will receive technical in-service training up to six weeks in length. Twenty six agents will undergo a six month training course in rice production at the Salakham Research Center in FY70. Three hundred and ten farmer leaders participated in a six-day rice training session throughout Laos during FY69. This program will train 760 farmer leaders in FY 1970.

The Home Economics portion of the RLC Extension program complements USAID's food production program through village training programs in nutrition, home gardens, child care and development, and basic sanitation.

## 6. AGRICULTURE RESEARCH (CROPS AND SOILS)

USAID/RLC research activities consist of jointly planned projects emphasizing adaptive research. New rice varieties, fertilizer trials, use of insecticides and pesticides and the introduction of new cultural methods are indicative of the work underway. In FY'71 and onward multiple cropping programs and research on crops other than rice will be placed on an equal priority with the activities oriented exclusively towards the production of rice. Research trials will be located throughout the country, however the research center at Salakham, 13 kilometers from Vientiane, will remain the hub of project operations. Training continues to be the principal function of the Salakham station. Two separate six months courses are given per year in rice production. In FY'71, a 20 week multiple cropping course will be introduced. All instruction is patterned after similar courses at IRRI and are taught by Lao and TCN graduates of the Rice Institute at Los Banos.

## 7. Participant Training

Over the past ten years (1960-1969) the Agriculture Division has sent 270 Lao participants for training outside of Laos. Of this number 179 have been sent for training, mostly to Thailand, for periods less than six months. Another 76 have received training in more technical fields for periods from six months to one year. Fifteen students have been sent for training for periods of over one year with five of this number receiving college degrees as a result of this program. Beginning in FY'70 we are making a substantial effort to obtain degree training on a much greater scale.

The Irrigation sub-project plans to have 51 degree trained participants by end of FY'79 with 38 of those participants receiving their degrees in Irrigation Engineering and 13 others in such fields as Administration, Economics, Soil Science, ect.

The Crops and Soils sub-project plans to have 54 degree trained participants by 1980 majoring in fields such as Plant Science, Soils Science, Entomology Plant Pathology, Agriculture Economics, etc. Non-degree training through 1980 calls for training 139 participants in such areas as rice production (IRRI), corn production, vegetable production, fruit production, rodent control, rice drying, storage, milling, etc.

The Extension sub-project, which includes Home Economics, plans to have 7 participants complete degree training by 1976 majoring in Extension, Agronomy, Horticulture, etc. A total of 21 participants will be sent to third countries for rice production (IRRI), rural youth development, information techniques, etc. by 1971.

In Fisheries plans call for 10 participants to complete degree training in Ichthyology by 1977. Four participants will complete 8 weeks training in fish culture by 1971 and 20 others will complete a 12 weeks course in fish culture by 1974.

Live stock has only one participant programmed at the present time. This participant is presently being prepared to undergo a 16 week course in Iran covering hoof and mouth disease.

#### G. OTHER DONOR ASSISTANCE TO AGRICULTURE

Bilateral aid from other friendly countries to the agricultural sector has assumed significant proportions in recent years. Japan has, since 1964, sponsored and staffed a Lao-Japanese demonstration farm in conjunction with the now-scheduled development plan for Tha Ngern Irrigation Project. In addition Japan has furnished nearly \$200,000 equivalent in

agricultural machinery and materials over the past two years under the general terms of the Kennedy Round Tariff agreements. Proceeds from the sale of this equipment has been used about equally between agricultural and other developmental projects. Japanese Overseas Volunteers are also assigned to agricultural projects and are actively assisting ADO in the repair and maintenance of farm machinery.

The United Kingdom also has materially assisted the rice program with gifts of water pumps, tractors and other agricultural machinery valued at about \$150,000 in the last two years. An additional \$90,000 has been contributed toward the construction, in conjunction with USAID and the RLG, of a soils laboratory for the Direction of Agriculture.

Australia has made available numerous scholarships, the services of technicians, plus several tractors and other items of machinery valued at about \$1.7 million since 1964.

Israel has, since 1965, contributed the services of three experts to operate an experimental farm near Vientiane. In 1969 Israeli experts commenced design work on a 5,000 - hectare irrigation project; recently New Zealand agreed to continue this design project after Israel asked to be relieved of it.

France discontinued assistance to a cotton project in Sayaboury province in 1970, however the French Government is going ahead with the construction of the Royal School of Agriculture at Don Dok. This school will be of the secondary level and is scheduled to open it's doors on October 1, 1971.

FAO phased out a technical assistance project with RLG Extension Service in 1969, however they have recruited a Virologist for assistance to the Veterinary Service,

**The Asian Development Bank recently approved a nearly 1.0 million dollar loan with which the major construction at the Tha Ngom irrigation project will be financed.**

## **H. PROGRAM EVALUATION AND MANAGEMENT**

USAID has been involved in programs of technical assistance to the RLG Agricultural Service since 1954. Programs have come and gone, expanded and contracted, but through it all a technical capability has been built - a capability that can and does function as it should.

Nearly every technician assigned to one of the major agricultural activities in Laos has received some formal training to equip him for his job. This training has been accomplished not only in Laos but in Thailand, Japan, England, the USA, France, Israel and the Philippines and with this training and the continued presence of foreign (principally U. S.) advisors the Agricultural Service has reached a good degree of technical competency.

The time has now come to incorporate the acquisition of efficient management techniques into the personnel of RLG. The limited ability of RLG to sustain financially the programs already conceived requires our best efforts to prepare the Direction of Agricultural to make the most of what they will have in the future. Project Managers are being constantly reminded that the wise use of USAID resources is equal in importance to the technical integrity of their travail. USAID will stress the importance of management at every opportunity with RLG. Some careless business practices have been revealed, and although correction of these deficiencies is a painful process, it will be a continuing procedure throughout the life of the ADP.

Table C  
Page 1 of 2  
COUNTRY:

Noncapital Project Funding (obligations in \$000)

PROP DATE  
Original  
Rev. No. 1  
Project No. 439-11-190-065

Fiscal Years	Ap.	L/G	TOTAL	CONT	Personnel Serv.			Participants	
					AID	PASA	CONT	U. S. Agencies	CONT
Prior through Act. FY'69	TC/SA	6	10,600.0		3,030.0	150.0	1,111.0	419.0	
Oper. FY'70	"	"	2,133.0		785.0	-	484.0	150.0	
Budg. FY'71	"	"	2,524.7		760.6	-	626.8	169.5	
B + 1 FY'72	"	"	2,710.0		786.5	500.0 */	555.6	191.3	
B + 2 FY'73	"	"	2,759.4		810.9	500.0 */	520.8	198.1	
B + 3 FY'74			2,759.4		810.9	500.0 */	520.8	198.1	
All Subs.			11,297.0		4,054.5	-	2,604.0	990.5	
Total Life			34,783.5		11,038.4	1,650.0	6,423.0	2,316.5	

\*/ This \$1.5 million would -- under an optimum funding level -- provide for a BuRec PASA team to carry forward the studies on the 10,000 hectare Khao Liao irrigation project through the design stage. This would provide the RIG complete data on the construction phase to satisfy requirements for either loan application or appeal to other donors for financing. It is clear, however, that under existing budget guidelines, these design studies cannot be included in the forthcoming FY 1972 Project budget Submission, except perhaps under the proposed program augmented by 25%.

Table C - Extension  
Page 2 of 2 continued

Fiscal Years	Commodities		Other Costs	
	Dir. U. S. AG.	GOVT	Dir. U. S. Ag	GOVT
Prior through Act. FY'69	5,418.0		161.0 <del>472.98</del>	311 <del>xx</del>
Oper. FY' 70	529.0		185.0	-
Budg. FY'71	682.7		285.1	-
B + 1 FY'72	561.0		111.8	-
B + 2 FY'73	619.1		110.5	-
B + 3 FY'74	619.1		110.5	-
All Subs.	3,095.5		552.5	-
Total Life	11,526.2		1,516.4 <del>1,989.98</del>	311 <del>x</del>

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Table 1

Exchg rate \$1 = 500K

Project No. 439-11-190-065

Fiscal Years	AID-Controlled <sup>1/</sup> Local Currency		Other Cash Contribution Contributing Country	Other Donor Funds (\$ Equiv.)	Food for Freedom Commodities		
	U. S. owned	Country owned <del>2/</del>			Metric Tons (000)	CCC Value Freight (\$000)	World Market Price (\$000)
Prior through Act. FY <u>69</u>	710.4	<del>211</del> <sup>934</sup>	327.4	1,390	-	-	-
Oper. FY <u>70</u>	326.0	-	151.2	420	-	-	-
Budg. FY <u>71</u>	238.0 <del>324</del>	-	151.2 <del>324</del>	587	-	-	-
B + 1 FY <u>72</u>	211.0	-	151.2	703	-	-	-
B + 2 FY <u>73</u>	218.0	-	151.2	<sup>452</sup> <del>482</del>	-	-	-
B + 3 FY <u>74</u>	218.0	-	151.2	452	-	-	-
All Subs.	1,090.0	-	754.0	4,000	-	-	-
Total Life	3,014.4	<del>211</del> <sup>934</sup>	1,839.4	6,004	-	-	-

~~1/ U.S. owned and country owned commodities are shown.~~

~~2/ U.S. owned and country owned commodities are shown.~~

<sup>1/</sup> Kip 500 = \$1

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