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PROJECT NOTE NO. 4

DRY SEASON CROP PRODUCTION - 1981/82 - LAM NAM OON

LAM NAM OON INTEGRATED RURAL DEVELOPMENT PROJECT

WORK PERFORMED BY
SPECIFIC ASSIGNMENT TEAM (S.A.T.)
- LAM NAM OON -

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JUNE 15, 1982

LOUIS BERGER INTERNATIONAL, INC.

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FORWORD

The Louis Berger International, Inc. advisory team at Lam Nam Oon produces various kinds of informational and analytical data. These comprise: Quarterly Reports; Technical Notes; Project Planning Notes; Project Notes; and advisory memoranda.

We collaborate very closely with Thai personnel at Lam Nam Oon; and we regard their efforts as the foundation-stones for the future development of a prosperous Lam Nam Oon irrigated area. Much inventiveness and initiative marks the efforts of the Royal Thai Government's personnel at Lam Nam Oon. We try to identify, support, report about, and improve such efforts.

We also believe that some of the innovations introduced at Lam Nam Oon may make a mark upon the history of applied integrated rural development in an irrigation setting.

Accordingly, The Center for Rural Development, which is a Division of the Louis Berger Group of companies, issues this Report as Project Note Number 4.

Currently, in 1982, the Center supports ten major rural development projects which are funded by the World Bank, the U.S. Agency for International Development, the Asian Development Bank, and other international agencies in Asia, Africa, the Middle East and Latin America.

As a part of it's services to clients and the professional community of those engaged in rural development, the Center releases technical and project information on various aspects of individual projects.

For those interested in Project Note #4 (Lam Nam Oon) additional copies may be obtained from the Center for Rural Development, c/o Louis Berger International, Inc. 100 Halsted Street, East Orange, New Jersey 07019, U.S.A.

1. Introduction

Lam Nam Oon is an irrigation project of the Royal Irrigation Department, (R.I.D.) Ministry of Agriculture and Cooperatives, Royal Thai Government, Thailand.

It is located in Northeastern Thailand. It is a region that is poor in soils, relative frequency and density of rainfall, and income for the people.

During the 1960's the Royal Thai Government began to devote more developmental attention to the Northeast. Among those efforts, irrigation was one mode selected for development. Given the relatively poor condition of Northeastern soils, the undulating terrain, and the relative scatteration of localities with some irrigation potential - only a limited number of major irrigation sites could be found for development.

Lam Nam Oon is one of these. It is an area of approximately 29,000 Hectares or 186,000 Rai. It contains approximately 12,000 farmers who own farms ranging in size between less than 1 Hectare or 6.25 Rai to 7 Hectares-plus or 40 Rai-plus. About 57% of these farmers own and cultivate farms that are in the 1-minus Hectare to 4 Hectare size (less than 6.25 Rai or up to 24 Rai)

Survey work on Lam Nam Oon began in 1962. Main dam construction was completed in 1971 by R.I.D. In the period from 1972 until 1979 the Left and Right Main Canals (cement lined) and their laterals (cement lined) were completed by R.I.D. In 1980, the last of four electrically powered pumping stations were installed by R.I.D. on certain canals and became operational for the 1980/81 Dry Season. (December-May).

Starting in 1978, the Royal Irrigation Development began to design and install on-farm ditch distribution systems from the laterals into farming areas. A total of 1,926 Kilometers of farm ditches will be installed by R.I.D. by the end of 1985.

Presently, June 1982, about 10% of the total farm ditching installation required or 192 Kilometers has been completed. Present plans call for speeding up the pace of installation to about 500 Kms./year during the Dry Seasons of 1982/83, 1983/84, 1984/85.

While this construction work is going forward, completed portions of the new on-farm ditch systems are being operated and water is also flowing through the Main Canals and laterals into all fields where the traditional Wet Season farm ditches exist.

During this year's Dry Season (1981/82) a total of 5,500 Rai or about 870 Hectare received irrigation water through the new on-farm ditches that had been completed. Another 20,000 Rai or about 3,200 Hectare received irrigation water through the Main Canals and Laterals and into the traditional Wet Season farm ditches.

At each Dry Season, the Integrated Project personnel at Lam Nam Oon are endeavoring to encourage more farmer's to cultivate crops during that period. This is not easy because the farmer's of the Northeast have never cultivated under irrigated Dry Season conditions. Whole new technologies and practices have to be introduced and adopted by the farmer-cultivators.

Two prime needs have been constantly asserted by the farmer-cultivators at Lam Nam Oon: a reliable supply of water; and a market situation which contains limited or no risk to them.

The participating Royal Thai Government agencies in the integration effort at Lam Nam Oon are trying to meet those twin needs as fast as possible. The agencies include: the Royal Irrigation Department; the Department of Agriculture; the Community Development Department; the Department of Fisheries; the Department of Non-Formal Education; the Department of Agriculture Extension.

In the 1980/81 Dry Season of one year ago, the various agencies - assisted by a special national Dry Season Production Committee endeavored to provide some stable market conditions for farmer-cultivators in the production of groundnuts at Lam Nam Oon. The results of that experience are reported by Sansonthi Boonyothayan, Assistant Field Director of the project, in Project Note #3, August 6, 1981.

As Project Note #3 shows, approximately 8,000 Rai or 1,194 Hectare of Groundnut was grown at Lam Nam Oon in last year's Dry Season of 1980/81. That was the first irrigated Dry Season in which such a major expansion in irrigated cropping area took place. The principle reasons for this included: expanded reliable supplies of water to farmer fields and a Baht 8 "floor price" on groundnuts with no limit on the area to be cultivated or the quantities to be purchased.

In this year's Dry Season at Lam Nam Oon, 1981/82, the Dry Season Production Committee pursued a different policy. It dropped the "floor price" on groundnuts to Baht 7 Kilo and limited the area of eligible cropping to 2,500 Rai or 400 Hectare.

The dramatic "downward push" of this policy on this year's 1981/82 Dry Season production at Lam Nam Oon is shown in the following pages.

This is the first year that the data on cropping area cultivated in the Dry Season has been so reliably assembled and managed for Lam Nam Oon.

This year's drop in cultivated area is all the more significant, in showing irrigator-cultivator sensitivities to risk factors, because the supply and reliability of irrigation water at Lam Nam Oon in this year's 1981/82 Dry Season was better than last year's 1980/81 Dry Season.

II. The Specific Assignment Team (S.A.T.)

Until September, 1981 the Lam Nam Oon Integrated Rural Development Project had only field worker's operating for it, who were employees of the participating Departments. These included the Tambol (sub-District) Agricultural Officers, the Tambol Community Development Officers, and another set of officer's in these two Departments at the District (Amphur level). There are thirteen Tambols and three Amphur which form a part of the Lam Nam Oon area.

Additionally, there were personnel specially assigned by the Department of Fisheries, Department of Non-Formal Education, Department of Community Development, and the Department of Agricultural Economics.

Finally, there were the engineering technical, and construction worker's of the Royal Irrigation Department.

All of these personnel were and are supervised by their own Department's. In some cases, such as Agricultural Officers and Community Development officers - they must report to the District Officer (Nai Amphur) and perform whatever tasks may be assigned at that level. In other cases, such as the Royal Irrigation Department's Operations and Maintenance Division, the Design Division, and the Construction Division each operates under general budgetary allocations and routines defined somewhere else besides at Lam Nam Oon.

The above personnel and departments are coordinated in their work on the Lam Nam Oon area by the Project Field Director, Vichai Snguanpaiboon, at the Lam Nam Oon Operations Center and his Assistant Field Director, Sansonthi Boonyothayan.

During the years since the integrated project began in 1978 a remarkable degree of coordination has been achieved among the personnel and departments. However, there was no staff at the project directly assignable to specific activities by the Project Field Director and the Project Assistant Field Director.

Starting in September, 1981 the above situation changed slightly. At that time, the Project Field Director directly employed seven Agricultural High School graduates as temporary staff. They report to him and the Assistant Field Director through the Lam Nam Oon Operations Center.

The young, fledgling, S.A.T.'s (as they are called) have been given various training courses at Lam Nam Oon. They are used, as a group, in performing planned and carefully supervised data-gathering activities. In some cases, as they learn more, they are also assigned to provide elementary technical novice to farmer-irrigators in the irrigated Lam Nam Oon area. In general, they are becoming a valuable add-on to the already coordinated participating personnel at Lam Nam Oon.

III. The Assignment

Since Dry Season cultivation first began in the 1976/77 year at Lam Nam Oon there has been conflicting data generated about area cultivated, location of the areas, and crop yields. Different Departments provided different sets of figure simply because each one perceived matters from a different point of view.

None of the Departments had sufficient field staff available for a long enough period each Dry Season to perform a sustained, carefully orchestrated, set of observations. Also, they lacked a centralised data processing and retrieval facility to handle the data generated. Everybody realised that a common set of figures should be developed - even if these related only to total area cultivated, by crop, and canal locations. Concern about developing data on Yields, at least for the Dry Seasons, was relegated to a second order of importance, simply because that was even harder to obtain and standardize. The priority was placed on areas and locations.

Various methods were tried to gather such data. In the Dry Season of 1980/81 for example, the Louis Berger International, Inc. advisory team proposed that low-level aerial infra-red photography be tried. The necessary supplies were imported from United States by Berger, the Project Field Director obtained the use of a 2nd Army helicopter, and the Berger team provided the cameras. The area was flown in April, 1981 and the photography was done. Unfortunately, difficulties in film development techniques at Bangkok as well as errors in camera settings produced results that were not adequate.

The team is now investigating the feasibility of using LANDSAT high-altitude photography to do this work on the Dry Season of 1982/83. However, it is probable that this kind of photo coverage will not produce the distinctive reporting on variety-by-variety of crops that is needed.

For this year Dry Season of 1981/82 it was decided to train and supervise the S.A.T.'s to do the task of observing each farm field, canal system by canal system. Routines for field visits were established and the S.A.T.'s were trained. Their performance was supervised, and the detailed field work was done in several weeks. Nonetheless, as may be noted in Section VIII below, a number of errors or omissions occurred.

On the whole, the S.A.T.'s performed their assigned task with greater reliability and thoroughness than had been achieved previously. Their gathered data was then processed and organised as reported in the following Section V.

The data contained in the following pages was gathered as a result of very specific task assignments to the S.A.T.'s during the cultivation period of the just-completed 1981/82 Dry Season. They did field-by-field observation work according to a set plan. They also had to follow a regimen of scheduling the observation work for all 25 canal system in the Lam Nam Oon project area.

All observations were completed by April 15, 1982. The data was then processed as reported in the next section.

IV. The Apple III Micro-Computer Operation at Lam Nam Oon:

It is now axiomatic that a contemporary developmental project cannot be provided with adequate technical advisory services unless micro-computer backup in the form of hardware, software, and skilled services are employed.

Both of the Louis Berger International, Inc. engineering advisors at Lam Nam Oon have employed such equipment. Mr. Erroll Coles, the designer of an Operations Research on-farm ditch layout at Lam Nam Oon, utilised his personally owned Hewlett-Packard-85 micro-computer at Lam Nam Oon. During his eighteen months stay at Lam Nam Oon from January 1980 to June 1981 Mr. Coles used that equipment to: assist in checking his equations for the design of a Tertiary-Quaternary farm ditch system at Lam Nam Oon; the development of a Tertiary Drainage Coefficient for Lam Nam Oon; and the development of a Rainfall Analysis study at Lam Nam Oon.

Mr. William Bell, the long-term resident Louis Berger International, Inc. engineering advisor at Lam Nam Oon acquired his Apple III micro-computer, printer, and software in August, 1981. This \$5,000 value equipment, purchased by Mr. Bell at his personal expense, became operational at Lam Nam Oon in September, 1981.

In making the system operational, Mr. Bell opened it up for use by all interested Thai personnel at Lam Nam Oon. At the same time, he has concentrated on utilizing his micro-computer as a irrigated water management tool and as a data accessioning, analysis, and retrieval system.

In this latter connection, Mr. Bell has worked with various activities at the Lam Nam Oon Operations Center in order to provide back-up service through the micro-computer. In so doing, it has been learned that there are a number of crucial services that can be provided by the micro-computer. It has also been learned that the current Thai staff at Lam Nam Oon, provided by the various participating Departments, do not know the fundamentals of micro-computer programming and data processing. The need for a training program in such skills for selected personnel drawn from Lam Nam Oon is urgent; and the kind of training needed requires full-time efforts in the Thai language for about three months.

Among the services developed and programmed by Mr. Bell on the micro-computer, the gathering, accessioning, analysis, and retrieval of this year's 1981/82 Dry Season cropping area data has been completed. Using the data provided by the S.A.T's, (as described in Section III above), Mr. Bell has programmed an analysis and display as shown in the following Section V.

Section V results are now being translated into the Thai language by the Lam Nam Oon Operations Center. Those results will be distributed widely among participating agencies and Lam Nam Oon personnel by the Project Field Director. At the same time, as discussed in Section VI below, the results are being used to examine the comparative volumes of cultivation activities along the 25 canal systems which comprise the Lam Nam Oon irrigation complex.

Hopefully, by the next Dry Season of 1982/83 a sufficient cadre of Lam Nam Oon Operations Center personnel will be trained intensively in micro-computer programming and data processing so that an improved crop area and canal system-related data gathering and analysis program can be operated by Thai project personnel in that year.

V. The Tabular Findings for Crop Area and Location - 1981/82
Dry Season

On May 17, 1982 the following analysed data was provided to the Project Field Director, Vichai Snguanpaiboon, by Mr. William Bell, (Louis Berger International, Inc. advisory engineer) as follows:

SUBJECT: DRY SEASON CROP 81-82

THE ATTACHED SHEETS SHOW RESULTS OF DRY SEASON 81-82 CROP AS REPORTED BY THE SAT'S. THIS DATA IS NOW IN THE COMPUTER AND AVAILABLE FOR OTHER COMBINATIONS OF CROPS AND AREAS.

A. THE TOTAL PROJECT AREA CROPPED IS 5464.75 RAI WITH 2140 FARMERS PARTICIPATING. THE FOLLOWING ARE PERCENTAGES OF TOTAL AREA AND FARMERS INVOLVED:

CROP	AREA (RAI)	% AREA	% FARMERS
PEANUTS	1740.5	31.85	31.36
WATERMELON	1055	19.31	8.50
PUMPKIN	1005.75	18.40	9.30
RICE	438	8.02	3.69
VEGETABLES	418.5	7.66	13.79
CORN	346	6.33	15.23
TOBACCO	229.75	4.20	9.95
UPLAND	136.75	2.50	6.96
G-RICE	94.5	1.73	1.21

TOTAL 5464.75 RAI

B. KINDS AND AMOUNTS OF CROP GROWN BY DISTRICT (AMPHURS) AND NUMBERS OF FARMERS:

AMPHOE PK (PHANG KONE)

AREA IN	RICE	161.25	NUMBER OF FARMERS	23
"	"	G-RICE	65	19
"	"	UPLAND	42	23
"	"	SWEETCORN	153.25	119
"	"	TOBACCO	169	130
"	"	PEANUTS	798	248
"	"	VEGETABLES	309.75	155
"	"	PUMPKIN	357.25	66
"	"	WATERMELON	976	141
TOTAL AREA		3031.5	TOTAL # FARMERS	924

AMPHOE PN (Panna Nikhom)

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	RICE	267.75	NUMBER OF FARMERS	55
" "	G-RICE	26.5	" " "	6
" "	UPLAND	55.25	" " "	44
" "	SWEETCORN	104	" " "	93
" "	TOBACCO	29.25	" " "	31
" "	PEANUTS	560.25	" " "	220
" "	VEGETABLES	92.5	" " "	108
" "	PUMPKIN	638.5	" " "	121
" "	WATERMELON	69.5	" " "	26
TOTAL AREA		1843.5	TOTAL # FARMERS	704

AMPHOE MU (Muang)

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	RICE	9	NUMBER OF FARMERS	1
" "	G-RICE	3	" " "	1
" "	UPLAND	39.5	" " "	82
" "	SWEETCORN	88.75	" " "	114
" "	TOBACCO	31.5	" " "	52
" "	PEANUTS	382.25	" " "	203
" "	VEGETABLES	16.25	" " "	32
" "	PUMPKIN	10	" " "	12
" "	WATERMELON	9.5	" " "	15
TOTAL AREA		589.75	TOTAL # FARMERS	512

KINDS AND AMOUNTS OF CROPS GROWN ALONG EACH MAIN CANAL SYSTEM (COUNTING ALL LATERALS SERVED BY EACH) AND NUMBERS OF FARMERS:

CANAL SYSTEM R (Right Main Canal)

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	RICE	200.75	NUMBER OF FARMERS	40
" "	G-RICE	29.5	" " "	7
" "	UPLAND	74.75	" " "	114
" "	SWEETCORN	144.25	" " "	166
" "	TOBACCO	57.75	" " "	80
" "	PEANUTS	749.25	" " "	341
" "	VEGETABLES	81.75	" " "	111
" "	PUMPKIN	579	" " "	121
" "	WATERMELON	61	" " "	37
TOTAL AREA		1978	TOTAL # FARMERS	1017

CANAL SYSTEM L (Left Main Canal)

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	RICE	237.25	NUMBER OF FARMERS	39
"	" G-RICE	65	" " "	19
"	" UPLAND	62	" " "	35
"	" SWEETCORN	198.75	" " "	154
"	" TOBACCO	172	" " "	133
"	" PEANUTS	986.75	" " "	327
"	" VEGETABLES	336.75	" " "	184
"	" PUMPKIN	426.75	" " "	78
"	" WATERMELON	994	" " "	145
TOTAL AREA		3479.25	TOTAL # FARMERS	1114

D. KINDS AND AMOUNT OF CROPS GROWN ALONG EACH CANAL AND NUMBERS OF FARMERS:-

CANAL SYSTEM R1L

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	RICE	22	NUMBER OF FARMERS	5
"	" UPLAND	7	" " "	2
"	" SWEETCORN	34.25	" " "	19
"	" PEANUTS	139.25	" " "	47
"	" VEGETABLES	32.5	" " "	28
"	" PUMPKIN	153	" " "	26
"	" WATERMELON	10	" " "	6
TOTAL AREA		398	TOTAL # FARMERS	133

CANAL SYSTEM R2L

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	UPLAND	2	NUMBER OF FARMERS	1
"	" SWEETCORN	4	" " "	5
"	" TOBACCO	2.75	" " "	3
"	" PEANUTS	16	" " "	6
"	" VEGETABLES	2.5	" " "	3
"	" PUMPKIN	2	" " "	1
"	" WATERMELON	1	" " "	1
TOTAL AREA		30.25	TOTAL # FARMERS	20

CANAL SYSTEM R3L

AREA IN	CROPS	AREA	NUMBER OF FARMERS	FARMERS
AREA IN	SWEETCORN	2	NUMBER OF FARMERS	1
"	" VEGETABLES	2.5	" " "	4
"	" PUMPKIN	60.5	" " "	14
TOTAL AREA		65	TOTAL # FARMERS	19

CANAL SYSTEM R4L

AREA IN	UPLAND	11.75	NUMBER OF FARMERS	9
"	" SWEETCORN	3	" " "	5
"	" TOBACCO	8.5	" " "	6
"	" PEANUTS	12	" " "	5
"	" VEGETABLES	3.5	" " "	2
"	" PUMPKIN	275.25	" " "	57
"	" WATERMELON	.75	" " "	3
TOTAL AREA		314.75	TOTAL # FARMERS	87

CANAL SYSTEM R6L

AREA IN	RICE	167.75	NUMBER OF FARMERS	32
"	" G-RICE	26.5	" " "	6
"	" UPLAND	14.25	" " "	19
"	" SWEETCORN	10	" " "	19
"	" TOBACCO	6.75	" " "	8
"	" PEANUTS	159.25	" " "	63
"	" VEGETABLES	19.75	" " "	34
"	" PUMPKIN	3.25	" " "	3
"	" WATERMELON	6	" " "	3
TOTAL AREA		413.5	TOTAL # FARMERS	187

CANAL SYSTEM R7L

NOT OPERATIONAL IN THE DRY SEASON OF 1981/82

CANAL SYSTEM R8L

AREA IN	UPLAND	.25	NUMBER OF FARMERS	1
"	" SWEETCORN	2.25	" " "	3
"	" TOBACCO	1	" " "	1
"	" PEANUTS	4.5	" " "	3
"	" VEGETABLES	4.75	" " "	8
"	" PUMPKIN	42	" " "	10
"	" WATERMELON	30	" " "	8
TOTAL AREA		84.75	TOTAL # FARMERS	34

CANAL SYSTEM R9L

NOT OPERATIONAL IN THE DRY SEASON OF 1981/82

CANAL SYSTEM R10L

NOT OPERATIONAL IN THE DRY SEASON OF 1981/82

CANAL SYSTEM R11L

NOT OPERATIONAL IN THE DRY SEASON OF 1981/82

CANAL SYSTEM R12L

NOT OPERATIONAL IN THE DRY SEASON OF 1981/82

CANAL SYSTEM R13L

AREA IN			NUMBER OF FARMERS	
AREA IN	UPLAND	1		1
" "	SWEETCORN	3.25	" " "	2
" "	TOBACCO	9.75	" " "	14
" "	PEANUTS	37.75	" " "	21
" "	VEGETABLES	2	" " "	2
TOTAL AREA		53.75	TOTAL # FARMERS	40

CANAL SYSTEM R14L

AREA IN			NUMBER OF FARMERS	
AREA IN	RICE	9		1
" "	G-RICE	3	" " "	1
" "	UPLAND	3.5	" " "	6
" "	SWEETCORN	13	" " "	9
" "	TOBACCO	.25	" " "	1
" "	PEANUTS	2	" " "	1
" "	VEGETABLES	2.5	" " "	5
" "	PUMPKIN	.5	" " "	2
" "	WATERMELON	.5	" " "	1
TOTAL AREA		34.25	TOTAL # FARMERS	27

CANAL SYSTEM R15L

AREA IN			NUMBER OF FARMERS	
AREA IN	UPLAND	1.25		2
" "	PEANUTS	13	" " "	6
" "	VEGETABLES	.5	" " "	2
TOTAL AREA		14.75	TOTAL # FARMERS	10

CANAL SYSTEM R16L

AREA IN			NUMBER OF FARMERS	
AREA IN	UPLAND	12.5		30
" "	SWEETCORN	11.5	" " "	30
" "	TOBACCO	3.5	" " "	7
" "	PEANUTS	259	" " "	120
" "	VEGETABLES	1.75	" " "	5
" "	PUMPKIN	.25	" " "	1
" "	WATERMELON	.25	" " "	1
TOTAL AREA		288.75	TOTAL # FARMERS	194

CANAL SYSTEM R17L

AREA IN			NUMBER OF FARMERS	
AREA IN	TOBACCO	16.75		26
" "	PEANUTS	.5	" " "	2
" "	WATERMELON	2.5	" " "	1
TOTAL AREA		19.75	TOTAL # FARMERS	29

CANAL SYSTEM L1L

AREA IN UPLAND	12	NUMBER OF FARMERS	9
" " SWEETCORN	82	" " "	55
" " TOBACCO	137.5	" " "	102
" " PEANUTS	613	" " "	157
" " VEGETABLES	140.5	" " "	68
" " PUMPKIN	215.5	" " "	34
" " WATERMELON	654	" " "	91
TOTAL AREA	1854.5	TOTAL # FARMERS	516

CANAL SYSTEM L2L

AREA IN RICE	15.25	NUMBER OF FARMERS	4
" " G-RICE	12	" " "	4
" " SWEETCORN	5.5	" " "	5
" " TOBACCO	16.5	" " "	14
" " VEGETABLES	.75	" " "	2
" " PUMPKIN	23	" " "	7
TOTAL AREA	73	TOTAL # FARMERS	36

CANAL SYSTEM L1R

AREA IN RICE	140	NUMBER OF FARMERS	16
" " G-RICE	6	" " "	1
" " UPLAND	1	" " "	1
" " SWEETCORN	35.5	" " "	17
" " PEANUTS	13	" " "	7
" " VEGETABLES	30.5	" " "	15
" " PUMPKIN	50.25	" " "	9
" " WATERMELON	7	" " "	2
TOTAL AREA	283.25	TOTAL # FARMERS	68

CANAL SYSTEM L2R

AREA IN RICE	32	NUMBER OF FARMERS	3
" " G-RICE	8	" " "	2
" " UPLAND	8	" " "	3
" " SWEETCORN	3.5	" " "	4
" " PEANUTS	28.5	" " "	14
" " VEGETABLES	50.5	" " "	20
" " PUMPKIN	5	" " "	2
" " WATERMELON	222	" " "	30
TOTAL AREA	357.5	TOTAL # FARMERS	78

CANAL SYSTEM L3L

AREA IN RICE		NUMBER OF FARMERS	
	11		4
" " G-RICE	39	" " "	12
" " UPLAND	21	" " "	10
" " SWEETCORN	49.25	" " "	49
" " TOBACCO	16	" " "	15
" " PEANUTS	141.5	" " "	73
" " VEGETABLES	55.75	" " "	35
" " PUMPKIN	32	" " "	8
" " WATERMELON	3	" " "	1
TOTAL AREA	368.5	TOTAL # FARMERS	207

CANAL SYSTEM L4R

AREA IN RICE		NUMBER OF FARMERS	
	5		2
" " UPLAND	6	" " "	2
" " SWEETCORN	10	" " "	7
" " PEANUTS	49.5	" " "	18
" " VEGETABLES	3	" " "	6
" " PUMPKIN	54	" " "	3
TOTAL AREA	127.5	TOTAL # FARMERS	38

CANAL SYSTEM L5L

AREA IN RICE		NUMBER OF FARMERS	
	12		5
" " UPLAND	6	" " "	3
" " SWEETCORN	2	" " "	2
" " PEANUTS	28.75	" " "	13
" " VEGETABLES	4.25	" " "	4
" " PUMPKIN	3.25	" " "	3
TOTAL AREA	56.25	TOTAL # FARMERS	30

TURNOUTS OFF LEFT MAIN CANAL

AREA IN RICE		NUMBER OF FARMERS	
	22		5
" " UPLAND	8	" " "	7
" " SWEETCORN	11	" " "	15
" " TOBACCO	2	" " "	2
" " PEANUTS	112.5	" " "	45
" " VEGETABLES	51.5	" " "	34
" " PUMPKIN	43.75	" " "	12
TOTAL AREA	358.75	TOTAL # FARMERS	141

TURNOUTS OFF RIGHT MAIN CANAL

AREA IN RICE	2	NUMBER OF FARMERS	2
" " UPLAND	21.25	" " "	43
" " SWEETCORN	61	" " "	73
" " TOBACCO	8.5	" " "	14
" " PEANUTS	106	" " "	67
" " VEGETABLES	9.5	" " "	18
" " PUMPKIN	42.25	" " "	7
" " WATERMELON	10	" " "	13
TOTAL AREA	260.5	TOTAL # FARMERS	237

VI. Map Showing Canal systems and Graphed Percentage of Cropping for 1981/82 Dry Season.

The attached Map shows the Canals Systems at Lam Nam Oon. The Graph in the Upper Right Hand section of the map shows what percentage of the total area under cultivation in the Dry Season of 1981/82 was located along what Canal System.

As may be noted, the System comprised of Canal L-1L was the best performer, accounting for more than one-third of all area cultivated.

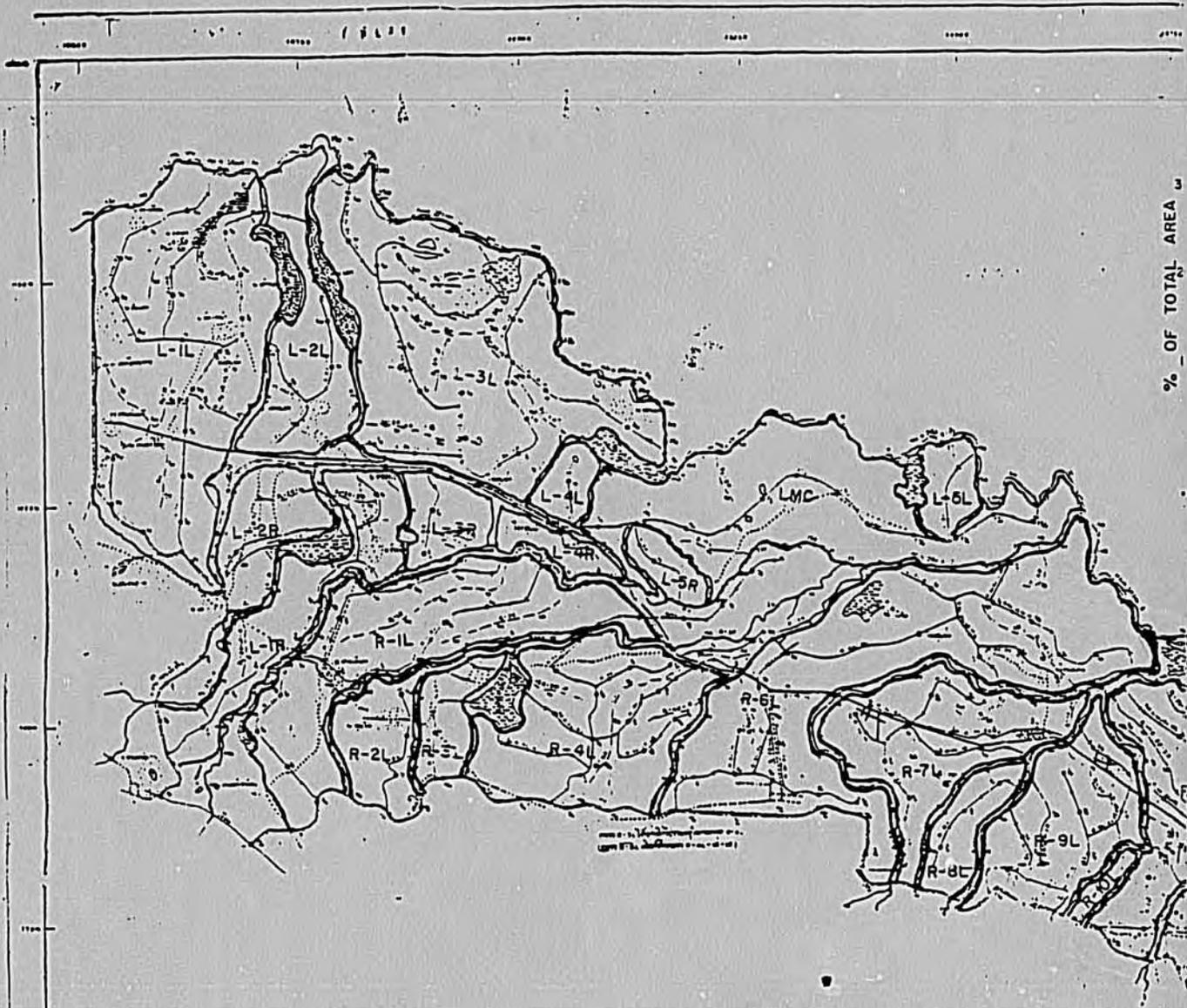
This is of interest since the L-1L system consists only of Laterals with no new Ditch/Dyke on-farm canals installed. On the other hand, this is an area where - starting in 1975 - the R.I.D. installed improved cement-lined access canals from each Constant Head Orifice (CHO) or turn-out along these Laterals. Also, the farmer's were assisted in improving some of the ditches (rainy season types) in their fields.

It is in this area, also, that the new micro-computer-based water management system was being installed in the 1981/82 Dry Season. Finally, it is in this area that R.I.D., using private contractors under contract, began to rehabilitate damaged or collapsed cement-lined access canals from the CHO's into the fields.

See Map Attached.

VII. Recommendations for Future Development of Improved Data:

In order to improve the quality and reliability of future data about cropped area, variety of crops, and location of crops served by each Canal System the following Recommendations are offered for 1982/83 Dry Season and later Dry Seasons:



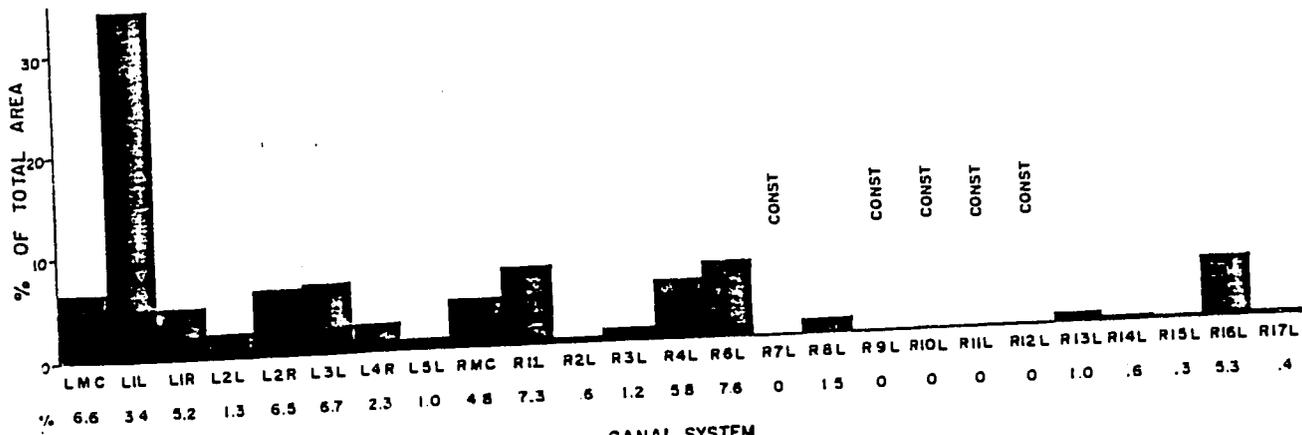
• AREA CULTIVATED IN EACH CANAL SYSTEM •

LAM NAM OON

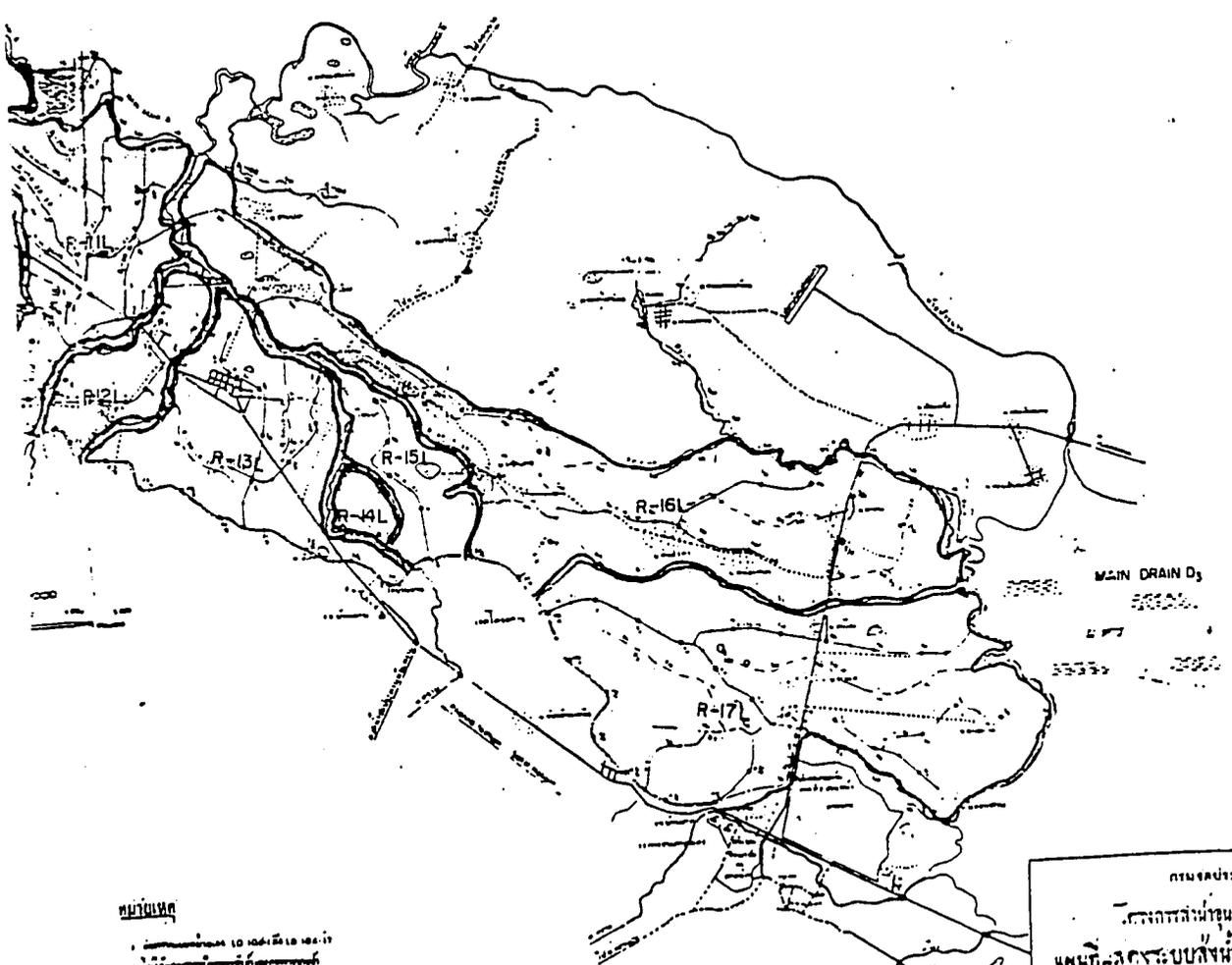
(December 1981 to May 1982)

- 5,464.75 Rai Total Area Cultivated on All 25 Systems
- BEST SYSTEM: Canal L-1L 34% of all cultivated area
- NEXT BEST: Canal R-6L 7.6% of all cultivated area
- OTHER 23 SYSTEMS: SEE CHART





CANAL SYSTEM



- สัญลักษณ์
- 1. แนวคันดิน
 - 2. แนวสันเขื่อน
 - 3. แนวประตูน้ำ
 - 4. แนวท่อระบายน้ำ
 - 5. แนวคูน้ำ
 - 6. แนวคันดิน
 - 7. แนวสันเขื่อน
 - 8. แนวประตูน้ำ
 - 9. แนวท่อระบายน้ำ
 - 10. แนวคูน้ำ

กรมชลประทาน
 โครงการชลประทาน ๗ ลลลลลล
 แผนพัฒนาโครงการชลประทานและระบบชลประทาน

ชื่อโครงการ		เลขที่	
ปีงบประมาณ		ปีพ.ศ.	
ชื่อพื้นที่		พื้นที่	
ชื่อตำบล		พื้นที่	
ชื่อหมู่บ้าน		พื้นที่	
ชื่อเกษตรกร		พื้นที่	
ชื่อผู้รับประโยชน์		พื้นที่	
ชื่อผู้ดำเนินการ		พื้นที่	
ชื่อผู้ตรวจสอบ		พื้นที่	
ชื่อผู้จัดทำ		พื้นที่	
ชื่อผู้แก้ไข		พื้นที่	
ชื่อผู้พิมพ์		พื้นที่	
ชื่อผู้จัดพิมพ์		พื้นที่	
ชื่อผู้จำหน่าย		พื้นที่	
ชื่อผู้รับพิมพ์		พื้นที่	
ชื่อผู้รับจัดพิมพ์		พื้นที่	
ชื่อผู้รับจำหน่าย		พื้นที่	
ชื่อผู้รับรับพิมพ์		พื้นที่	
ชื่อผู้รับรับจัดพิมพ์		พื้นที่	
ชื่อผู้รับรับจำหน่าย		พื้นที่	

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1. A more systematic and coordinated gathering of data is required in which the S.A.T. should work with the R.I.D. Zoneman for each Canal System. Also, within each Canal System the Zoneman responsible should work with the assigned S.A.T. and with each Chaek leader for each Chaek (area served by a CHO) receiving water from that Canal System.
2. S.A.T.'s, Zonemen, and Chaek leaders should be better trained in how to estimate crop areas, report on varieties of crops, and locate the exact areas within a Chaek where various varieties are being cultivated.
3. An improved, detailed, Thai language system of Chaek mapping and Canal System mapping and canal, CHO, numbering is needed. Adequate numbers of these maps must be made up so that S.A.T.'s, Zonemen, and Chaek leaders will have copies.
4. An improved system for monitoring the data gathering periodically, and remedying any deficiencies immediately, should be organized in relation to micro-computer programmed instructions.
5. There is a need to make the reporting on each variety of crop more detailed. "Vegetables", example, should be reported as: "Tomatoes", "leek", etc.
6. Selected Lam Nam Oon Operations Center staff should be given intensive three-months training in micro-computer programming and data processing. Such personnel should then handle and improve the crop area program for data-gathering, analysis, and retrieval in the 1982/83 Dry Season and thereafter.

Among some of the discrepancies noted in the 1981/82 Dry Season data-gathering the following are significant. They comprise the reasons for the Recommendations suggested above. They include:

- a. Several Canal Systems were omitted (notably R-17L) by the S.A.T.'s and had to be separately visited and calculated by other staff.
- b. There were some areas of CHO's or turnouts along the Right Main Canal and the Left Main Canal where the S.A.T.'s did not get data about crops cultivated, yet independent observations showed that some crops were growing in such locations.

- c. The C/O numbering system used by the S.A.T.'s along some Canal Systems does not appear to be correct. So that in some few cases there was confusion on locations.
- d. There was at least one instance of S.A.T. carelessness in reporting such that the name of a Village was reported in the wrong Tambol.
- e. The crops now included in the "upland" category did not seem to be rigorously reported on by the S.A.T.'s. Hence, that category accounted for 2.50% of the area reported and yet nothing is known about what comprised the crops in that 136.5 Rai area.

More detailed reporting about each variety of crop seems essential. For example, the present category of "vegetables" is too general. It must be broken down by type of vegetable in future.