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LAM NAM OON INTEGRATED RURAL DEVELOPMENT PROJECT

QUARTERLY REPORT

February 1980 - April 1980



Contract Between

MINISTRY OF AGRICULTURE AND COOPERATIVES

of the

KINGDOM OF THAILAND

and

LOUIS BERGER INTERNATIONAL, INC.

of

THE UNITED STATES OF AMERICA

(AID Loan Agreement No. 493-T-020)

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LAM NAM OON INTEGRATED RURAL DEVELOPMENT PROJECT
ROYAL IRRIGATION DEPARTMENT
THAILAND
ASSISTED BY
THE CENTER FOR RURAL DEVELOPMENT
BERGER GROUP

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LAM NAM OON

Ref. No. LBII/268

May 8, 1980

Khun Roongrueng Chulajata
Project Field Director
Lam Nam Oon Integrated Rural
Development Project
Amphoe Phang Khone
Sakon Nakhon

LETTER OF TRANSMITTAL

2nd QUARTERLY REPORT
LOUIS BERGER INTERNATIONAL, INC.
ADVISORY TEAM

Dear Roongrueng,

This will be the Final Quarterly Report which you will receive as Project Field Director for Lam Nam Oon. We submit herewith ten (10) copies.

We wish to thank you for all of the advice and support which you have provided to us; and to wish you well in your new assignment.

As you will note from the contents of this Quarterly Report, we now have a broader perspective on the potentials and needs of Lam Nam Oon than heretofore.

We sum the potentials as:

1. An almost-completed main and secondary canal system capable of getting water to areas comprising about 185,000 rai.
2. A completed soils classification map of the area which facilitates selection of cropping plans.
3. Land consolidation projected for 30,000 rai. This should facilitate creation of efficient on-farm water management systems for that area.
4. Strong support by the Governor and other Changwat and Amphur personnel.
5. Department of Agriculture and Department of Agricultural Extension Programs in the area which foster applied research and demonstration/training for farmers.
6. Common participation, by a number of departments, in efforts to integrate economic and social development of the area.
7. A widespread small farm pattern of cultivation and ownership with very few large landholders and a low rate of tenancy farming.

The needs are technical; and they can be met. They include:

1. An urgent need to develop on-farm systems of water management which (a) conserve water (b) cost relatively low/rai improved (c) are acceptable to farmers either under the terms of the Ditch/Dike Act or the Land Consolidation Act or both.
2. A parallel need to improve the drainage in the area as rapidly as possible.
3. Identification of the best crops with high market potentials; and the adoption of an area cropping plan.
4. Sustained training of Department of Agriculture and Department of Agricultural Extension Personnel in the Agronomics of irrigated agriculture.
5. The development of water user and other types of farmer organizations in the area.
6. Improved systems and staffing for integrated planning, budgeting, implementation, and reporting among participating agencies.
7. Expanded credit services and other special farm assistance packages for the area.

We are hopeful that, given the good start which you and the Team Leaders have supported during the past few years, it will be possible to meet a number of the listed needs prior to the ending of our participation in this project.

Sincerely yours,


James J. Dalton
Team Leader

LOUIS BERGER INTERNATIONAL, INC.

JD:nlp

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CHAPTER I

ASSESSMENT

At this point in time, April 1980, what is the physical, technical, and institutional status of this project?

There are many ways to answer that question; but in this section two guideposts will be used. One is the IBRD Thailand - Irrigation Program Review of December 1976. The other is the Output section of the Logical Framework which forms a part of the Project Paper of April 27, 1977.

The IBRD Irrigation Program Review identifies a number of RID needs including:

- (1) More emphasis on reliable and timely delivery of water to farmers' field through:
 - (a) System upgrading and O & M.
 - (b) Higher standards of water control.
 - (c) Higher standards of mapping and design.
- (2) Improved organization and management;
- (3) Expanded planning and programming capability including evaluation of incremental costs and benefits of varying intensities of on-farm development.
- (4) Greater reliance on contracting as opposed to Force Account construction.

The USAID Project Paper of April 27, 1977 accepts the IBRD Review and asserts that:

"... many of the approaches suggested in the IBRD Review are fundamental elements of the design of the Lam Nam Oon Project..."

Are these IBRD-inspired approaches being applied at Lam Nam Oon today?

The answer is 'yes'.

But that affirmative has to be qualified by the observation that the project is vastly behind schedule on one point, the advice and test phase - in which the foreign technical advisory team was to play a vital role for the on-farm irrigation aspects of the project.

At the minimum, that team should have arrived at Lam Nam Oon at the beginning of the Dry Season in 1978. In fact, it arrived two years later in the middle of the 1979/80 Dry Season. This has had a number of consequences; but the most crucial one concerns the point that the design and tent of on-farm water systems for Lam Nam Oon is now out of sequence with other developments at Lam Nam Oon by at least three Dry Seasons.

What this means for irrigation, becomes clear when the Logical Framework Outputs for that activity are reviewed:

(1) Main Canal and laterals

These are to be all completed and operational by FY 1981; and this will be accomplished by RID.

However, this generates two problems. On the one hand, the 10,000 farmers in the area will see the entire system full of water by the Dry Season of 1982; but the means to deliver that water onto farms in a timed and organized manner will not be available on any large scale until about the Dry Seasons of 1983 and 1984. This assumes that current tests and designs just now being started will yield results that are expandable rapidly after test in the Dry Seasons of 1980/81 and 1981/82.

In this lies the heart of one of the problems. How is it possible to retrain farmers during the Dry Seasons of 1980/81 and 1981/82 in the use of irrigation water when the on-farm irrigation systems will not yet be in existence on any scale?

One answer exists in allowing as well as encouraging interested farmers to take what are, essentially, high risks in using the existing rainfed Ditch/Dike systems. That is the current policy. Under that policy it is assumed that, somehow, a portion of the water now coursing through the laterals adjacent to 72,000 Rai will get to farmer's fields. This policy has the merit of letting risk-takers go on to learn about water use during the Dry Seasons; but it does generate charges that R.I.D. is failing to supply water in adequate quantities or at timely intervals and it does result in some farmer's taking heavy losses.

Yet, existing production figures for the Dry Seasons of 1979 and 1980 show that an increasing number of farmers are gambling upon making some use of the water which passes their fields. Upland crop and vegetable production in Amphur Phang Khone and Phannanikom in the 1979 Dry Season totalled 4,110 Rai. In 1980, this figure doubled to 8,614 Rai.

Improved application of this policy in the next few years could include a conscious R.I.D. effort through the use of Zonemen combined in liaison with Kaset Tambola to minimize the risks accruing from infrequent or inadequate water supply to farmer's fields. It could also involve a 'mixed' series of efforts by the Department of Agriculture and the Department of Agriculture Extension aimed at serving both irrigated agriculture needs and those of rainfed agriculture in the Lam Nam Oon area.

In any case, the foregoing problem signals that some rural development implications of this project cannot be exploited, fully, until the on-farm water systems are adequately designed, tested, and placed in an accelerating mode of application on an extensive scale.

A second problem has to do with the rapid decline of the maintained conditions of the main canals and secondaries in the Lam Nam Oon system. The unstable soils of the area, high runoff velocities of rainfall, and heavy siltation all combine to damage the existing system at a rapid rate. Canal cement linings are undermined, shifting soils crack the linings, and growing loads of silt cover the canal beds. This means that a considerable level of attention and funds must start going into maintenance of what is now in place or otherwise there will be little point in developing on-farm water delivery systems.

How much demand that may impose upon RID and foreign advisory staff is unknown at this juncture. The reference Annex A indicates that considerable time may be involved. To date, only about one-third of the existing Main Canals have been examined for maintenance needs. Nothing has, as yet, been done about looking at the 200-plus kms. of Lateral Canals.

(2) Drainage System:

While rights-of-way have been acquired for some drainage canals, there has been virtually no development of a drainage system for the area. Altogether, by 1983, 300 kms. of drainage are supposed to be installed; but at present levels of activity and considering the need to resolve certain Land Consolidation issues related to drainage, it is more than probable that this figure will not be reached until 1986.

(3) Land Consolidation:

RID is adhering to the targets for Land Consolidation. It is, in fact, somewhat ahead of schedule having completed 1,000 Rai in Pilot Area 1 during 1979; and it just finishing 3,000 Rai in Pilot Area 3 during 1980.

There are certain design problems with what is being done. The model for on-farm water delivery that is being applied concerns the so-called Chao Phaya, land levelled and consolidated system. So far, in Pilot Area 3 this has resulted in very heavy cut and fill operations, major amounts of land clearing and boundary realignments, and extensive levelling of soils. Costs for such a system exceed Baht 6,000 per rai and the disturbance of fragile Northeastern soils may not be offset by production gains that can be achieved from improved water management alone.

Additional complications with this system include its limited usefulness as a means of rotating water allotments to different areas; and its consequent wastefulness of what is, essentially, a limited water supply.

As indicated, elsewhere, in this Quarterly Report the Louis Berger Advisory Team has suggested an alternative to the Chao Phaya model.

However, a decision has been made by RID to continue to apply the Chao Phaya model to the next 10,000 Rai targetted for Land Consolidation in Tambols Rie and Wang Yang during the 1980/81 Dry Season. This model has been modified slightly, with land clearing and levelling minimised. It is to be installed by private contractors on 6,000 Rai and 4,000 Rai by Force Account. While still essentially disadvantageous, the system can be made to function with some degree of efficiency and the Louis Berger advisory team is now concentrating upon increasing that degree through improved design and developing suggested management practices.

(4) Ditch and Dike areas:

This comprises the major physical area of the Lam Nam Oon project; and, in some ways, it is the most controversial portion of the project. Presently, the only ditch/dike system that exists is based on the old rainfed ditches, bunds, and dikes which farmers have installed in their fields during the past few decades.

Such a system is not adjusted to the provision of irrigation water since the laterals and their turn-outs usually run at different angles and elevations to the traditional rainfed ditches and dikes. In some few local instances it is possible to rearrange channels in such a way that some use of water supplied by laterals can take place in the Dry Season. In general, however, this is not so.

R.I.D. wishes to plan an extensive Ditch/Dike system for about 150,000 Rai during the next three years. However, there are two difficulties associated with this goal.

On the one hand, because of the long delay in assigning a foreign advisory team to Lam Nam Oon no model for a new Ditch/Dike system has been designed and tested.

A related problem concerns exactly what can be done under the existing Ditch/Dike Act, in terms of design specifications, for canals, access roads, and drains in areas where the farmers will retain absolute control over all improvements.

Currently, the only action on this front at Lam Nam Oon concerns the efforts of the Field Project Director, the Team Leaders, and the Louis Berger Advisory team to select a site for a Pilot Area 2 location. It is hoped that, beginning in the Dry Season of 1981/81, at least three Ditch/Dike models can be designed and tested.

Alternatively, it may become necessary to apply the Land Consolidation Act on a modified basis - to the entire area. Through that means, R.I.D. would obtain the necessary legal rights to influence farmers towards acceptance of rationalised water supply systems.

Meanwhile, until the tests are completed and an evolved model applied on some scale, the general area of Lam Nam Oon cannot be regarded as operational as an organised, water-managed, irrigation system. The only exception to that statement will be the areas under the command of the Chao Phaya model - as it is extended.

(5) Detailed research plans completed and being applied:

There are supposed to be three Pilot Areas in this project. Each is to have a slightly different research plan and focus. So far, two Pilot Areas (1) and (3) have been selected and RID has applied the Chao Phaya model to both. No other types of research have been introduced in those Pilot Areas except for some work on crops by the Department of Agriculture.

Currently, the Louis Berger advisory team is designing some tests and research for the proposed Pilot Area 2 area; Annex B; these, generally, concern the physical layout and operation of ditch/dike systems.

Additionally, the Louis Berger advisory team is considering some applied research concerning the liming of soils in the Lam Nam Oon area, marketing possibilities, and a revised cropping plan for the area. Work on the liming investigations and marketing will begin during the next quarterly period.

(6) A completed road net including feeder roads and O & M roads (Item 2 in Log Frame Outputs):

The Project Paper plan calls for a total of 330 Kms. of O & M roads to be constructed by 1981. Based on observed RID experience to date in Pilot Areas 1 and 3, this target seems to be over-ambitious and not essential - particularly when applied to Ditch/Dike areas. In such areas, it is very difficult to obtain farmer consent for use of their land (in any extent) either for canals, drainage, or roads. The RID cannot compensate them for such land and, in the absence of application of the Land Consolidation Act, their boundaries cannot be realigned in order to spread the loss of farm land around many farmers.

As the test models for ditch/dike systems are evolved in the proposed Pilot Area 2 the exact dimensions of this problem will be clear; and it is probable that existing O & M road construction targets will be revised sharply downwards.

(7) On-farm operation and maintenance of the water supply and drainage system affected (Item 3 in the Log Frame Outputs):

As of the date of this Report, this item is inoperative. There is no self-help farmer contribution to O & M charges for two reasons:

(a) there is not, as yet, a system for delivering water onto the farm fields in an organised manner, except for Pilot Areas 1 and 3; and (b) no attention has yet been paid by RID or the Integrated project as a whole about how to organise the farmers so that they can contribute to local O & M.

Other effects, flowing from the long delay in advisory services start-up are less obvious.

One concerns a Purpose of the project, namely to 'improve Thai capability to coordinate project elements, link irrigation schemes to on-farm water use, etc.'

What has happened, to date, in this matter is vertical integration by Departmental objective and financial plan. This is inevitable, since the Royal Thai Government's systems of budgeting, work scheduling, and financial management are organised along vertical 'top-down' lines. An integrated project, such as Lam Nam Oon, actually needs a special staff arm connected with the Field Project Director in order to enable him to execute the necessary feasibility studies, target-setting, and monitoring actions essential to assisting the various participating Departments.

To date, Lam Nam Oon has lacked this capacity, though as shown in the attached Annexes C and D there are now recommendations for remedying all or a part of that lack. In the absence of such a special staff, the Project Field Director has accomplished some degree of horizontal integration through four principal means:

(1) Personal leadership.

This is a principle component in the successes scored to date. There is no problem confronted by a Department, either locally or nationally, to which the Field Project Director will not address his time and energy in seeking a satisfactory solution. This may involve meetings at the Changwat, in the Amphura, or among national agencies at Bangkok. Priority is constantly given to fostering a coordinated approach to all problems.

(2) Monthly (and sometimes more frequent) Team Leader meetings:

These sessions are operated rigorously, with each Team Leader expected to present reports of progress and signal problems. Decision-making on project policies is by Team Leader consensus.

(3) Mobilization of national agency interest:

Working with individuals in various national agencies such as Agriculture, Agricultural Extension, etc. the Field Project Director has involved them in specific activities in places like Pilot Area 1 and 3. This has led to special support and assigned staff from particular Divisions at Bangkok or Khon Kaen; and it has certainly strengthened the technical facilities available to the project.

Additionally, there has been a sustained effort by the Team Leaders to draw attention to the Lam Nam Oon project. This has been done through such means as the Seminar on Integrated Rural Development held at Lam Nam Oon in December, 1979, special briefings for high-policy visitors like the Deputy Minister of Agriculture, Dr. Anat, etc.

(4) Use of USAID Loan funds as an incentive for common planning:

The present Loan from AID is structured in such a way that each Department participating at Lam Nam Oon can have access to loan funds. These vary in size. For example, the Department of Community Development has the largest potential fund; Baht 4,157,000 and the Department of Agricultural Economic the smallest; Baht 800,000. Altogether, these funds total almost Baht 16 million. It is understood between the American and Thai governments that this sum will be matched in contributions from the participating agencies.

To date, the programming and use of these funds has been beset by delays.

Eventually, the development of annual Work Plans and Financial Plans by each Department will comprise one minimal means of vertically integrating Departmental targets side-by-side in the same geographic areas for as long as the loan funds act as an incentive. Additional measures are needed to introduce horizontal integration in terms of shared workloads and common understanding of each other's mode of work, working personnel, and mutual objectives.

The foregoing, important though they are to integration, do not yet comprise a horizontally integrated process of program planning and implementation. Systems, trained staff, and assigned responsibilities can only foster the latter; and, as yet, there has been insufficient time for the technical advisory services to concentrate on these issues.

Other Outputs, drawn from the Logical Framework for this project, are at varying stages of implementation:

- (1) By 1981, for example, the Community Development Department is tasked to see to it that approximately 76,000 families in the area will have received Occupational Promotion training and other assistance. Similarly, in that same year, approximately 80% of all village families will have participated in integrated rural development training programs sponsored by CD.

In actual fact, while present CD Tambol staffing provides capacity to offer the scale of Occupational Promotion activities mentioned above, three other factors has caused a downward revision in these targets.

One factor concerns the question of just what kinds of Occupational Promotion should take place in areas where Cropping Plans are not yet determined and where it is unlikely that well-managed irrigation systems will be in place for another three or four years. A second factor has been the heavy drawdown on CD staff time caused by the necessity to assist R.I.D. in explaining the importance and benefits of Land Consolidation to individual farmers. Finally, the non-existence of an integrated staff at Lam Nam Oon has meant that the responsible resident CD officer and Assistant Field Project Director spends time filling this gap.

Similarly, the slow start-up in establishing the physical facilities and training program for the Integrated Rural Development Training Center at Ban Fang Daeng, Tambol Hi Yong, means that perhaps by 1981 only something like 10% of the farm families may be influenced by that Center rather than the 80% target claimed for that year in the Logical Framework.

- (2) There is certainly a functioning agricultural research and extension program in the area. This is due, principally, to the fact that the Department of Agriculture has invested staff, funds, and time heavily in the area; and the Department of Agricultural Extension is now staffed at the Tambol level to push certain crops and practices.

Pilot Areas 1 and 3 have been used, particularly by the Department of Agriculture, as laboratories for various kinds of applied research. In so doing, it has encountered difficult operational conditions - particularly in Pilot Area 3. These arise from lack of water management skills, and low soil fertility conditions, when planting upland crops on levelled soils. Nevertheless, some of the results achieved in growing Groundnut and Chillies have been encouraging to farmers. These kinds of activities, accompanied by a stronger orientation towards the agronomics of irrigated crops, need to be continued.

Such a trend would be in line with what is now taking place in the training of Kaset Tambols in the Lam Nam Oon area. A current, two-month, training seminar planned by the Kaset Changwat places much emphasis upon the unusual water supply, soil condition, and cropping plan requirements of the area. As may be noted from the curriculum and training schedule, Annex E, the emphasis in future will be, increasingly, upon treating the agricultural inputs as part of an entire agronomic and water management package.

- (3) Though by 1980 the Outputs demand that a package of farm inputs, services, and advice be assembled and applied - this is not yet taking place - largely for technical reasons.

For example, by 1980 agriliming of soils should have taken place to the extent that 19,500 Metric Tons of agrilime were distributed. In fact, with the exception of some very small agriliming tests in Pilot Area 3, no agriliming is taking place in the Lam Nam Oon area. Present investigations by the Louis Berger International, Inc. advisory team may conclude that liming is not the major problem originally depicted in earlier consultant studies. In any case, it will be at least another six months before this issue is technically settled and a course of action adopted.

Similarly, although credit and marketing inputs are required as a part of the project - the development of these components await new initiatives. These range in type and scale including: marketing studies, getting the Department of Cooperatives involved in the project, seeking special relationships with the banking industry, arranging special marketing conditions for certain types of crops like sugar cane, tobacco, etc.

While it is probable that some of these matters can be worked out for development in the Dry Season of 1980/81, it is most likely that any scale of development along these lines will not begin until the Dry Season of 1981/82.

- (4) Two Departments have progressed steadily towards their Output targets. These are Non-Formal Education and Fisheries. Both have moved forward with their own programs despite budgetary delays; and both have placed a special emphasis upon activities in the Lam Nam Oon area.

They are now entering a period when, with budget delays surmounted, they can program more intensively. It, therefore, becomes a matter of some urgency to determine what it is that they can do better and in greater intensity within the area.

- (5) By contrast, probably the least developed of the Outputs to date concerns the projected improved services in family planning, health care, and home economics and nutrition training.

This has several explanations. One is that, as yet, the project has not developed a special preventive health program aimed specifically at combatting the kinds of diseases which are commonly associated with irrigation projects in the Northeast, i.e. the incidence of liver fluke. Secondly, the regular Public Health service program is planned nationally and operated according to central priorities - so that unless some special preventive efforts are focussed on an area like Lam Nam Oon it tends to be treated equally with all others. Thirdly, much of the inputs for this whole category of effort was envisaged in the Project paper as coming from the Private, Voluntary, Organizations (PVO's). To date, very little has been done about trying to involve the PVO's in work at Lam Nam Oon.

Finally, although the Output section of the logical framework does not specify what the technical advisory services (foreign contract) should accomplish there are adequate guidelines within the contract of Louis Berger International, Inc. with the Ministry of Agriculture and Cooperatives.

Two complicating factors affect assessments about the service. One, already mentioned, is the delayed start-up. A second, equally important, concerns the contract's reduction in technical staff from the 203 man/months recommended in the project paper to the 139 man/months contained in the contract.

is latter change has resulted in time allocations to skills which make the Advisory Team fully effective only in the dry season of 1979/80 (though team start-up was late). In terms of required skills the Team will only be partially effective in the dry season of 1980/81. The attached Annex F presents recommended changes to improve matters, within the teams of the existing contract.

Annex A
MEMORANDUM

TO : Nai Charoon Pojsontorn
FROM : Erroll Coles, LBII Advisory Team
SUBJECT: Canal Maintenance Survey

March 12, 1980

1. Conduct a survey to prepare a report on the:
 - a) Condition of the primary canals and secondary canals for that area being irrigated at the present time to be known as Area A, and,
 - b) Continue survey into area that will be irrigated, known as Area B -- new canals and unused canals will also need to be maintained
 - c) a detailed schedule for the Maintenance Survey as attached.
2. The survey will be conducted as follows:
 - a) the canals will be inspected:
 - i by rating the condition of the lining whenever possible, even if the water level is high sufficient information can be obtained for the purpose.
 - ii the condition of the regulating structures, turnouts, drops, pump structures, etc.
 - iii the condition of the roads and their contribution to sedimentation of the canals.
 - iv combined with (i) above, an estimate of the amount of sediment in the canals. This can be obtained by taking soundings at sample cross section and estimating the total sediment to be removed.
 - v the need to provide drainage along section of the canal, particularly, in section in cut; an estimate of the amount of work will be based on this survey.
3. The purpose of this survey will be to:
 - i) to prepare a statement or report giving:
 - a) the extent of the work needed to bring the system in operational condition, if this is the case,
 - b) the costs of such work
 - c) the labour required
 - d) the equipment required.
 - ii to recommend any modifications that may be considered to contribute to improvement of operating the system
 - iii to prepare a draft schedule of operation if such a schedule is required; any existing operating schedule will be perused in the meanwhile and suggestions offered.

4. The following information would be required:

- i existing maintenance schedule,
- ii number of personnel involved in this programme and the level of responsibility,
- iii mechanical equipment used for maintenance,
- iv the operating schedule, that is, the amount of water being diverted into the primary canals and into the secondary canals; dully operation or otherwise.

5. The survey will be considered as follows:

Area A

- i the left primary canal
- ii the right primary canal
- iii the left secondary canal
- iv the right secondary canal

Area B

as in the above sequence

6. It is important that you accompany us on this survey and we would commence the work on Monday 17th March. We should start out as early as possible working up to midday each day until the work is completed.

cc: Field Project Director, LNO
Dalton, Bell, Hill, file

DETAILED SCHEDULE for the MAINTENANCE SURVEY

11/13

Survey of condition of headworks, all structures in main canals and laterals, canal linings, service roads, etc.

Survey should include the following:

- exact location of damaged section or component
- nature of damage or possible cause
- nature of repair work intended
- time and materials required
- date to begin and finish

Classification of required repairs as follows (urgency category):

- i immediate repairs required
- ii repairs necessary before following rainy season
- iii repairs that could be scheduled for one year or later
- iv repairs that could be put off for 2 or 3 years
- v suggestions for revision or improvement

To make a decision about repairs rehabilitation, modification, replacement, etc. The following questions should be answered as a guideline to assist in selection of optimum decision:

- is the facility ~~obsolete~~, or can it continue its function in a modern or renewed system?
- what is the risk if such structure collapses or otherwise fails to perform?
- what is the hazard for loss of life and property ?
- can changes of conditions under which the structure is performing, affect its serviceability ?
- what are the requirements of expanded facilities ?
- are the present operation requirements compatible with original design ?
- can the facilities be modified safely to meet present requirements ?
- what is the cost of present maintenance ?
- what are the maintenance costs after repair, rehabilitation, or modification ?
- are the required funds available ?

General Maintenance Criteria:

Canals - laterals - drains

- no vegetation or silt should exist under normal water levels
- no debris or objectional obstruction should be permitted in the canal
- no open gap should be permitted within canal embankment
- vegetation on canal embankment above normal water level should be less than 15 cm. high
- one embankment for vehicular travel the other a good foot path
- canal lining should be even and unbroken

Structure

- should be free of debris
- concrete should be free of cracks, unbroken and even
- earthwork around structure should be compacted
- adequate riprap should be in place
- all parts should be functional (not bent or broken)
- metal surfaces should have good coat of paint
- all lifting and moving devices should be well lubricated
- electrical components should be operational

Service Roads

- every spot of the canals should be accessible at reasonable speed throughout the year
- surface drainage provided
- no excessive ruts, holes, etc.
- no debris or obstructions on road
- road drain ditches in good repair and culverts serviceable

April 21, 1980

Roongrueng Chulajata
Project Field Director
Lan Nam Oen Integrated Rural Development
Project

Subject: Selection of Pilot Area 2 Site

From: J.J. ~~Johnson~~, Team Leader, Louis Berger International, Inc. Advisory
Team

Following up on the Team Leaders visit on April 2, 1980 to the Dong M
Fai area as a possible site for Pilot Area 2, Bell, Coles and myself spent
a half-day inspecting that area on April 19.

We prefaced our visit by carefully checking therelevant aerial
photos, canal layouts, and Land Suitability Map for the area. The only
physical thing missing in our study concerns the contour levels. If we had
those to study, we could then make a final recommendation to you on the
exact boundaries of a site. As it is, we can only recommend an area
for your consideration.

We classified the two Alternatives which you and the other Team
Leaders indicated as possible on April 3. These are: Alternative (1); and
Alternative (2). After checking the area, we suggest a third Alternative
which we labelled (1A).

Our description and observations on each Alternative follows:

Alternative (1):

Location:

This is to the west of Dong Mai Fai in a block that is bounded
on the north by the village of Man Phan Bek and on the south by
the Right Main Canal. The easternmost boundary is a drainage line.
The west boundary is Lateral B-12-1R.

Observations:

1. The area to be served is adjacent to only one lateral canal, B-12
1R. This raises a question about the volume, availability, and
frequency of water supply, particularly when the area to the
west of that canal must be irrigated.
2. Excluding turn-outs from the Right Main Canal there are only
four Turn-Outs serving this area.
3. The terrain on the north, towards the village of Man Phan Bek
appears to be high and uneven. This may raise problems about
siting different kinds of models for test in this area. It may
cause the entire area to be reduced below 2,000 Rai because
such terrain should be excluded.
4. The drainage situation at the south end of the proposed area
appears complex. This requires further study of contours; but the
initial impression is that a portion of the area might have to
be excluded because of the drainage situation.
5. The soils in the area are unbalanced proportionately to major
soils throughout the Lan Nam Oen area. This would cause problems
when seeking to set up models and approaches aimed at testing
crops on representative soils. The approximate area for each Code
in Alternative 1 is:

Code 9 (10,650 Rai)	650 Rai or 6.1% of whole area
" 5 (22,520 Rai)	650 Rai or 2.9% " " "
" 6 (20,230 Rai)	200 Rai or .9% " " "
" 2 (26,530 Rai)	400 Rai or 1.5% " " "

15

Alternative (1)Location:

This is to the south of Dong Mai Fai. The area is bounded on the north by the Udon-Sakon Nakhon highway and on the south by the Right Main Canal. On the west the boundary is a drainage huel and on the east, the Lateral R-13-L.

Observations:

1. The area to be served is adjacent to only one lateral, R-13-L and a short off-the-lateral, R-13L-1L. This raises a question about the amount of additional canal construction that would have to take place in the area in order to ensure a volume and frequency of water delivery sufficient for various models under test. Also, considering that R-13-L serves a much larger area elsewhere again raises uncertainties about volume and frequency of water delivery in the test areas.
2. Excluding Turn-outs from the Right Main Canal there are only 4 Turn-outs serving this area.
3. Compared to Alternative 2, the drainage situation seems better in this area.
4. The distance from the end of lateral canal R-13L-1L to the drainage huel appears to be about 1.5 kilometers. Again, this raises a question about the need for additional canal construction in the area.
5. While the balance of soils in this area is not as good as in Alternative (1) it is still out of proportion for certain widespread soils. The approximate area for each Code in Alternative 2 is:

Code 9	(10,650 Rai)	400 Rai	or 3.7% of the whole area.
" 8	(33,520 Rai)	400 Rai	or 1.1% " " "
" 6	(30,750 Rai)	1,000 Rai	or 3.3% " " "
" 2	(39,820 Rai)	200 Rai	or 0.5% " " "

Alternative (2)Location:

This is a 2000 Rai tract of land. It includes a portion of Alternative (1). The north boundary is the village of Ban Phan Sak and the lateral R-15L. The south boundary is the Udon-Sakon Nakhon highway and a part of the Right Main Canal. The west boundary is lateral canal R-15L-1L. The eastern boundary is the Right Main Canal. (These proposed boundaries might have to be altered somewhat following a study of the contours.)

Observations:

1. The area to be served is adjacent to three laterals.
 2. Excluding Turn-outs from the Right Main Canal there are 6 Turn-outs serving this area.
 3. The drainage situation looks good. A major natural drain almost splits the surface area in half. This will allow the design of different kinds of test models on each side of that drainage system.
 4. There is a much more balanced layout of soils representing the entire Loi Nam Sen in Alternative (2). The approximate area for each Code in Alternative (2) is:
- | | | | |
|--------|--------------|-----------|----------------------------|
| Code 9 | (10,650 Rai) | 550 Rai | or 5.0% of the whole area. |
| " 8 | (39,920 Rai) | 1,200 Rai | or 3.0% of the whole area. |
| " 6 | (30,750 Rai) | 550 Rai | or 1.8% of the whole area. |
| " 2 | (39,820 Rai) | 550 Rai | or 1.4% of the whole area. |

Recommendations

From a physical advantage point of view, the proposed Alternative (1j) has a number of advantages over the other two Alternatives. These can be summarized as:

- a) More available batonals.
- b) Larger areas of relatively level land.
- c) A drainage system which is equidistant from all points within the proposed area.
- d) A range of the major soils which allows testing on a more proportionately balanced amount of representative soils.

The exact boundaries of this 3,000 Rai Alternative (1j) requires definition only after there has been some careful study of the contours and levels within the area.

We recommend that the area be chosen soon as the site for Pilot Area 2, and cadastral and survey work be started so that delineation of boundaries (exact locations for the area) can be completed.

We recommend that work start, as soon as possible, on designing two and perhaps three test models for installation in Pilot Area 2 starting in the next Dry Season.

CC: Each Team Leader
W. Bell
E. Coles
G. Hill
Kosin Saisaengchan
Chairman of Putrobol
P. Gillespie - USAID
P. Gajewski - East Orange

Best Available Document

LOUIS BERGER INTERNATIONAL, INC.

- 2 -

The Staff will be advised and assisted by the Louis Berger International, Inc. advisory team.

The location of the Staff will be the Administrative Center, Lam Nam Oon Dam site.

Composition of this Staff will be:

- 1 Planning Specialist.....(C-6 level)
Preferably a Public Administrator, an economist or a sociologist with prior experience in developmental planning for Thai government agencies
- 1 Irrigation Engineer.....(C-5 level)
Preferably an experienced engineer with a record of having worked successfully with agriculture on irrigated projects
- 1 Agronomist.....(C-5 level)
An experienced individual in the agronomic aspects of crops and soils in Northeast irrigated areas
- 1 Public Administration Specialist.....(C-5 level)
Experienced manager/administrator in planning/ implementing RTG projects
- 1 Sociologist.....(C-5 level)
Experienced in developing/measuring social indicators and evaluating same.
- 1 Economist.....(C-5 level)
Master's degree in Economics, with experience in economic analysis of projects and cost/benefit measurements
- 1 Statistician.....(C-4 level)
Sound training in statistical measurements including computer application

LOUIS BERGER INTERNATIONAL, INC.

- 3 -

- 1 Management Information Specialist.....(C-4 level)
Trained and experienced in project performance tracking, financial and project reporting
- 1 Senior Draftsman.....(C-4 level)
- 1 Senior Office Manager.....(C-4 level)
Preferably bi-lingual and capable of providing backstop administrative support to the Staff and the technical advisory team
- 1 Senior Bookkeeper.....(C-4 level)
Skilled in the organisation and support of RTG budgeting, developmental budgeting, and advisory team operations
- 1 Senior Secretary/Typist.....(C-3 level)
Preferably bi-lingual
- 2 Junior Typists.....(C-2 level)
- 2 Drivers.....(C-level)
- 16 individuals

Vehicle support to be drawn from the \$ 42,000 now available in the AID Loan for RID. In the interim, before arrival of vehicle Staff to use Berger equipment.

Start-up of Staff to be not later than October 1, 1980.

JD:nlp

- cc: Saansonthi Boonyothayan, CD
- Tang Damrongbul, RID
- Niphan Prachantasen, DOAE
- Pramern Veturai, DOA Upland Crops
- Chalermkiat Saisoong, DOA, Rice Crops
- Khemchart Nimsomboon, Dept. of Fisheries
- Kosit Kosanasanti, Dept. of Non-Formal Education
- Kong Vichienprerd, Dept. of Liverstock
- Thongchai Thanyaharn, Land Consolidation Office

Annex D

**Actual integrated staff recommended to Civil Service Commission
and Bureau of Budget.**

- 1 Administrator (C-5)**
- 1 Administrator Assistant (C-3 or C-4)**
- 1 Financial Accountant (C-3)**
- 3 Typists**
- 2 Clerks**
- 1 Driver**
- 1 Janitor**

Annex E

โครงการพัฒนาชนบทแบบผสมผสานในเขตชลประทานอันนันท

หลักเกณฑ์การคัดเลือกกรมเกษตรศิลป์

๗ เมษายน ๑๙ ๖ มิถุนายน พ.ศ. ๒๕๓๓

I ตารางหลักเกณฑ์การ

วันที่	เดือน	สถานที่การฝึกอบรม
๗-๔-๑-๖๖	เมษายน	ศูนย์อำนวยการโครงการชลประทานอันนันท
๑๑	"	อำเภอ
๒๐-๒๒-๖๖	"	ศูนย์อำนวยการโครงการชลประทานอันนันท
๒๔-๖๔	"	อำเภอ
๒๔-๒๔-๖๖ และ ๒๕	เม.ย./พ.ค.	ศูนย์อำนวยการโครงการชลประทานอันนันท
๒	พฤษภาคม	อำเภอ
๔ ๑๓ ๖๖	"	ดูการเก็บเกี่ยวพืช
๑๔-๒๐-๖๖	"	ศูนย์อำนวยการโครงการชลประทานอันนันท
๒๒-๖๖	"	อำเภอ
๒๖ ๑๓ ๖๖	"	วิทยาลัย, จังหวัดกาฬสินธุ์
๒	มิถุนายน	วันสิ้นสุดการอบรมที่เขตโครงการชลประทานอันนันท

II รายการ มาตรการ และคณะที่ปรึกษา

<u>วันที่</u>	<u>เดือน</u>	<u>พ.ศ.</u>
๗,๘,๙,๑๐-๑๔,๑๖	เมษายน	๒๕๖๓

การสำรวจครอบครัวชนบทในเขตตำบล อ่าวน้ำจืด ต้องทำให้เสร็จ เพื่อให้เทศบาลใช้เป็นบรรทัดฐาน

<u>คณะที่ปรึกษา</u>			
๑. ดร.บอชฮิลล	เจ้าพนักงานประจำ	บริษัท	เกษตรนิเวศ
๒. กุศลโกสินธ์	โสมนสงขรินทร์	-	-
๓. กุศลชัยวงศ์	บุตรโรบอ	-	-

สถานที่กิจกรรม ศูนย์อำนวยการโครงการชดเชยตำบลอ่าวน้ำจืด แล้วจึงออกไป เยี่ยมงานตามจุดต่าง ๆ ภายใต้คำสั่งของคณะที่ปรึกษา

<u>วันที่</u>	<u>เดือน</u>	<u>พ.ศ.</u>
๑๗ ถึง ๒๐	เมษายน	๒๕๖๓

อบรมให้เข้าใจถึงความหมายของโครงการนวมหมมมสานในเขต อ่าวน้ำจืด

- ให้นำคณะกรรมการมาร่วมทำงานในโครงการนี้ ช่วยอธิบายกิจกรรม
- เกษตรตำบลทุกคนจะต้องศึกษาวิถีชีวิตการประมงงานกับกรมต่าง ๆ
- ไปสำรวจกิจกรรมในสนาม ตามโครงการที่อยู่ในเขตโครงการน้ำจืด

<u>คณะที่ปรึกษา</u>		
๑. กุศลชัยวงศ์	ผู้ช่วยผู้อำนวยการสนาม	
๒. TEAM LEADER	และคณะเจ้าหน้าที่ในสังกัด	

สถานที่กิจกรรม ศูนย์อำนวยการโครงการชดเชยตำบลอ่าวน้ำจืด หรือที่หอประชุม ทหารสามัคคี (ตากว่าง) หรือศูนย์ปฏิบัติการออกสำรวจตาม สถานที่ต่าง ๆ เช่น ที่ ตำบล โสภณบุรี ศูนย์อำนวยการโครงการชดเชยตำบลอ่าวน้ำจืด กรมการประมง กรมการศึกษา และกรมศึกษา

<u>วันที่</u>	<u>เดือน</u>	<u>พ.ศ.</u>
๒๓	เมษายน	๒๕๖๓

ชมรมเฝ้าคนในเขตอ่าวน้ำจืด

- ชมรมเฝ้าคนในเขตอ่าวน้ำจืด
- จัดให้เทศบาลตำบลอ่าวน้ำจืดได้ระดมสติปัญญา ของอาสาสมัคร และอาสาสมัครในเขตอ่าวน้ำจืด ให้เห็นถึงความสำคัญของการเฝ้า และติดตามในเขตอ่าวน้ำจืด

- ให้เกษตรกรนำเอาแผนที่ค่าบของตนมาเข้าที่ประชุมด้วย
- ให้ศึกษาถึงความเหมาะสมในการเพาะปลูกในค่าบของตน
- จำนวนเนื้อที่สำหรับการเพาะปลูกและสถานที่ที่จะทำการเพาะปลูก ฯลฯ
- นำเกษตรกรค่าบไปปลูกในที่ต่าง ๆ
- ชีให้เห็นความแตกต่างทั่ว ๆ ไป ของดิน
- ให้เกษตรกรค่าบ เขียนเครื่องหมายลงในแผนที่ค่าบของเขา

คณะที่ปรึกษา

- ๑. คุณโกสินธุ์ สะเมิงษา พนักงานในบริษัททอยเบอร์เบอร์
- ๒. คุณ W.C. Bell " " "
- ๓. คุณ E. Coles " " "
- ๔. J.J. Dalton " " "

สถานที่ฝึกอบรม

ศูนย์อำนวยการโครงการชลประทานอำเภอน้ำจูน หรือที่หอประชุมพระธาตุมณเฑียร (ถ้าว่าง) แล้วนำไปสำรวจในเขตอื่น ๆ

<u>วันที่</u>	<u>เดือน</u>	<u>พ.ศ.</u>
๒๓ ถึง ๒๔	เมษายน	๒๔๖๓
<u>แผนผัง</u>	<u>ระบบน้ำ</u>	<u>แผนที่เป็นการต่อไป</u>

- ให้ระบบจ่ายน้ำให้สม่ำเสมอ ปล่อยไปยังพื้นที่ ๓๖,๐๐๐ ไร่
- เกษตรกรค่าบต้องไป ๓ แห่ง ในการส่งน้ำ
 - ๑. การส่งน้ำได้หมดหรือไม่
 - ๒. " "พอใช้
 - ๓. " "ไม่ได้หมดเลย
- อธิบายถึงระบบคัน-คูที่มีอยู่เดิม
- แสดงให้เกษตรกรค่าบเห็นว่าควรจะส่งน้ำออกไปอย่างไรในอาณาเขตอำเภอน้ำจูน
- อธิบายถึงการชักจูงที่ดินขณะที่อยู่ในสภาพ Maximum Repercilling Criteria และแนะนำให้เห็นแปลงทดลองที่ ๓ หักตัวอย่าง
- บรรยายการชักจูงที่ดินในอนาคต ปกษาหาวิธีโครงการที่ควรพัฒนาตามเป้าหมาย
- อธิบายถึงหลักเกณฑ์ใหม่ ซึ่งอาจนำมาใช้กับพื้นที่เช่นนี้ได้ด้วย
- อธิบายถึงความหมายคำว่า ๆ เกี่ยวกับเรื่องทั้งหมดที่ให้แก่เกษตรกรค่าบ ผู้ที่จะต้องทำงานในเขตอื่น ๆ ๒-๓ ปี ข้างหน้า
- บรรยายเรื่องจำเป็นสำหรับคันคันของที่ ๒
- ศึกษา Pilot area 2
- ปรับปรุงระบบคัน-คู ในพื้นที่ของนอกเขตชักจูงที่ดิน

๖.๕

- คณะที่ปรึกษา
๑. คุณแต่ง จากกรมชลประทาน
 ๒. คุณวิโรช ผู้ช่วย
 ๓. คุณจรูญ ผู้ช่วย
 ๔. คุณสันต์สนธิ จากกรมพัฒนาชุมชน
 ๕. Mr. Coles & W.Bell จาก Louis Beger Inter. Inc.

สถานที่ฝึกอบรม ศูนย์อำนวยการโครงการชลประทานลำนาน้ำจน หรือที่หอประชุมพระธาตุมุเตา (ถ้ำว่าง)

<u>วันที่</u>	<u>เดือน</u>	<u>พ.ศ.</u>
๒๔	เมษายน	๒๕๒๓

แผนการปลูกพืช

- บรรยายเกี่ยวกับพืชเศรษฐกิจต่าง ๆ ซึ่งกรมวิชาการเกษตรได้ทดลองแล้วว่าเหมาะสมที่จะนำมาปลูกในพื้นที่เขตลำนาน้ำจน และข้อมูลต่าง ๆ ที่ได้จากการค้นคว้าและทดลองจากห้วยสีพัน
- บรรยายแผนการปลูกพืช ในพื้นที่ชลประทาน และนาระบบการปลูกพืชระบบที่ ๖ มาเป็นตัวอย่าง

- คณะที่ปรึกษา
๑. คุณประเวณี มาบรรยายเรื่อง พืชไร่
 ๒. คุณนิพนธ์ " " ข้าว
 ๓. คุณโกสินธุ์ และคุณชัยณรงค์ จากบริษัททูลุบเบอร์เบอร์
 ๔. James.J.Dalton " " "

สถานที่ฝึกอบรม

- ศูนย์อำนวยการโครงการชลประทานลำนาน้ำจน
- หอประชุมพิงโคน (ถ้ำว่าง)
- หอที่สนาม

<u>วันที่</u>	<u>เดือน</u>	<u>พ.ศ.</u>
๓๐	เมษายน	๒๕๒๓

การค้นคว้าทดลองหาพืชที่เหมาะสมและจัดระบบการปลูกพืช

- การบรรยายเกี่ยวกับการปลูกพืชในเขตลำนาน้ำจน โดยเจ้าหน้าที่จากกรมวิชาการเกษตร
- การบรรยายผลการค้นคว้าและทดลองเกี่ยวกับพืชไร่ ข้าว พืชสวน ในเขตลำนาน้ำจน โดยเจ้าหน้าที่จากกรมวิชาการเกษตร

สถานที่ฝึกอบรม

- ศูนย์อำนวยการโครงการชลประทานลำนาน้ำจน
- หอประชุมพระธาตุมุเตา (ถ้ำว่าง)
- สนามที่สนาม

๑ พฤษภาคม

- แปลงสาธิตและวิธีปฏิบัติจัดการการปนเปื้อน
- การอธิบายถึงการทำงานของกรมส่งเสริมการเกษตรเกี่ยวกับแปลงสาธิตในเขตโครงการชลประทานลำน้ำจูน
- การพูดถึงความสำคัญในการติดต่อเป็นเบื้องต้นกับเกษตรกรเจ้าของแปลงสาธิต และการทำการปนเปื้อนถึงการก้าวหน้าของแปลงสาธิตของแต่ละแห่ง
- การบรรยายถึงเครื่องมือวัดน้ำควรจะไปใช้ในแปลงสาธิตได้อย่างไร และการวัดน้ำมีจำเป็นอย่างไรในที่จะทำการปนเปื้อนเป็นอยู่เสมอ
- การอธิบายถึงการทำการปนเปื้อนเรื่องต่าง ๆ พร้อมทั้งข้อเสนอแนะ
- การไปเยี่ยมแปลงสาธิตตัวอย่างบางแห่งในเขตโครงการชลประทานลำน้ำจูน

วิทยากร

- นายนิพนธ์ ประจันตเสน กรมส่งเสริมการเกษตร
- Mr. Bell, และนายโกสินทร์ ๆ Louis Berger Team

สถานที่การฝึกอบรม

- ๑ ศูนย์อำนวยการโครงการชลประทานลำน้ำจูน หรือ ห้องประชุมอำเภอพระนครศรีอยุธยา (ถ้าไม่คิดขีด) และออกปฏิบัติงานภาคสนาม

๔-๑๖ พฤษภาคม

- ช่วงระยะเวลาเพื่อการเก็บเกี่ยวพืช

๑๘ พฤษภาคม

- กลุ่มเกษตรกรและสมาชิกผู้ใช้น้ำ
- ประเภทของกลุ่ม
- ความสำคัญของสมาชิกผู้ใช้น้ำ
- ประสิทธิภาพของรัฐบาลไทยต่อสมาชิกผู้ใช้น้ำ
- สิ่งอะไรบ้างที่เกษตรกรควบคุมสามารถช่วยเหลือได้บ้าง

วิทยากร

- นายชาติกร กรมชลประทาน
- นายสันต์สนธิ บุญโยทยาน กรมการไฟฟ้าสามชน
- นายโกสินทร์ และนายเบ็ต บริษัทที่ปรึกษาหลุยส์เบอร์เกอร์

สถานที่ฝึกอบรม

- ๑ ศูนย์อำนวยการโครงการชลประทานลำน้ำจูน หรือ ห้องประชุมอำเภอพระนครศรีอยุธยา (ถ้าไม่คิดขีด)

๒๐ พฤษภาคม

- การพัฒนาด้านการประมงในเขตโครงการชลประทานลำน้ำจูน
- ประเภทของการพัฒนาด้านการประมงที่ควรจะเป็น
- กรมประมงสามารถช่วยเหลือเกษตรกรได้อย่างไร
- การทดลองวันน้ำ สวนหม่อมในเขตโครงการชลประทานลำน้ำจูน

<u>วิทยากร</u>	นายกอง วิเชียรเทเวศ	กรมปศุสัตว์
	นายสันต์สนธิ์ บุชโยทยาน	กรมการพัฒนาชุมชน
	นายปริญญา ภาชนะวรรณ	กองวิทยากร

สถานที่ฝึกอบรม

ศูนย์อำนวยการโครงการชลประทานลุ่มน้ำจันทบุรี หรือ ห้องประชุมพรตธานี
(ถ้าไม่ติดขัด)

๒๑ พฤษภาคม

- ปัญหาการกำจัดศัตรูพืชใน เขตการชลประทาน
- ทำไมจึงมีปัญหามากมายเกี่ยวกับแมลงและสัตว์ที่เป็นภัยต่อพืช
ในเขตการชลประทานในฤดูนี้
- ประเภทของรูก้างที่สามารถช่วยเหยื่อเกษตรกรได้
- ประเภทของปัญหาพิเศษต่าง ๆ

วิทยากร

นายชัยณรงค์ บุชโรบล บริษัทที่ปรึกษาหอยดื่บเบอร์เบอร์
นายณิพันธ์ ประจันตเสน กรมส่งเสริมการเกษตร

สถานที่ฝึกอบรม

ศูนย์อำนวยการโครงการชลประทานลุ่มน้ำจันทบุรี หรือ ห้องประชุม
อำเภอพรตธานี (ถ้าไม่ติดขัด) และออกดูงานภาคสนาม

๒๒-๓๐ พฤษภาคม

- เกษตรตำบลเดินทางไปห้วยพิทน จังหวัดกาฬสินธุ์ เพื่อรับการ
ฝึกอบรมพิเศษด้านการจัดการใช้น้ำ เป็นระยะเวลาหนึ่ง
สัปดาห์

๒ มิถุนายน

- การสิ้นสุดของหลักสูตรการฝึกอบรมที่ศูนย์อำนวยการโครงการ
ชลประทานลุ่มน้ำจันทบุรี
- การตรวจผลเบื้องต้นของการสำรวจตามครัวเรือนอีกครั้ง
- หัวหน้าทีมตอบคำถาม
- การอภิปรายประเภทของการฝึกอบรมพิเศษเพิ่มเติมที่ต้องการ
ให้มีขึ้นในฤดูนี้

วิทยากร

- บรรณาธิการพิมพ์
ดร.ธิต, โกสินทร์, ชัยณรงค์, เป็ด และ โกลด์
บริษัทที่ปรึกษาหอยดื่บเบอร์เบอร์

สิ่งที่ส่งมา : รายละเอียดการกำหนดเวลาหลักสูตรนี้

ตารางกำหนดเวลาการฝึกอบรมโดยละเอียด
และวิทยากร

วิชา	วิทยากร	วันที่	๐๔.๐๐-๑๐.๐๐	๑๐.๐๐-๑๑.๐๐	๑๑.๐๐-๑๒.๐๐	๑๒.๐๐-๑๓.๐๐	๑๓.๐๐-๑๔.๐๐	๑๔.๐๐-๑๕.๐๐	๑๕.๐๐-๑๖.๐๐
๑) สํารวจรายครัวเรือน	อิธ-โกสินทร์ ชัยณรงค์ . . .	เม.ย.							
		๗	ศูนย์อำนวยการ ฯ ห้องประชุม อ.	ศูนย์อำนวยการ ฯ ห้องประชุม อ.	ศูนย์อำนวยการ ฯ ออกปฏิบัติงานภาคสนาม	อาหารกลางวัน	ออกปฏิบัติงานภาคสนาม	ออกปฏิบัติงานภาคสนาม	ออกปฏิบัติงานภาคสนาม
		๘	พรรคชาติคม	พรรคชาติคม		อาหารกลางวัน	ออกปฏิบัติงานภาคสนาม	ออกปฏิบัติงานภาคสนาม	ออกปฏิบัติงานภาคสนาม
		๑๐	-	-	-	-	-	-	-
		๑๔	-	-	-	-	-	-	-
๒) ความหมายของการผสมผสาน	สันต์สนธิ์และ บรรดาหัวหน้า คณะที่อู่แทน	๑๗	บรรยายบทบาท ของกรม	บรรยายบทบาทของ กรม	บรรยายเงินงบประมาณของแต่ละกรม ในโครงการชลประทานลำนํ้าจูน	อาหารกลางวัน	เยี่ยมสมาชิกการ เลี้ยงปลาในบ่อ	เยี่ยมสมาชิกการ เลี้ยงปลาในบ่อ	ว่าง
		๒๐	เยี่ยมศูนย์ฝึกอบรม ผสมผสานของ พัฒนาชุมชน - ไฮหย่อง	เยี่ยมศูนย์ฝึกอบรม ผสมผสานของ พัฒนาชุมชน - ไฮหย่อง	เยี่ยมที่ทำการฝึกอบรม ของกรมการศึกษานอกโรงเรียน	อาหารกลางวัน	บรรยายแผนภาพ หน้าของแต่ละกรม	ตรวจสอบ ทบทวนปัญหาของ โครงการชลประทานลำนํ้าจูน	อภิปราย
๓) ชนิดของดินในเขตโครงการชลประทานลำนํ้าจูน	โกสินทร์, เบ็ล โกธส-เคตสัน	๒๒	บรรยายชนิดของดินต่างๆในเขตโครงการชลประทานลำนํ้าจูนและแจกแผนที่แสดงพื้นที่ดินเหมาะแก่การเกษตร	อภิปรายการใช้แผนที่แสดงพื้นที่ดินเหมาะแก่การเกษตรให้เป็นประโยชน์	ขอร้องให้เกษตรกรค่าบดซีค เล็มบนแผนที่ของค่าบดของคนเพื่อแสดงให้เป็นประเภทของดินแต่ละชนิด	อาหารกลางวัน	ซีค เล็มงานแผนที่ต่อไป ฯลฯ	ออกปฏิบัติงานภาคสนามเพื่อเรียนรู้ดินประเภทต่างๆ	ออกปฏิบัติงานภาคสนามเพื่อเรียนรู้ดินประเภทต่างๆ

วิชา	วิทยากร	วันที่	๐๔.๐๐-๑๐.๐๐	๑๐.๐๐-๑๑.๐๐	๑๑.๐๐-๑๒.๐๐	๑๒.๐๐-๑๓.๐๐	๑๓.๐๐-๑๔.๐๐	๑๔.๐๐-๑๕.๐๐	๑๕.๐๐-๑๖.๐๐
๔) แผนผังระบบน้ำและแผนระบบน้ำสำหรับภายใน	แต่ง, วิรัช และจตุฏฐ -กรมชลประทาน สันติพันธ์ โกศล และ เบ็ญ	เม.ย ๒๓	แสดงแผนที่และชี้แจงพื้นที่ดิน ๓๖๐๐ ไร่ ที่ได้รับน้ำในปัจจุบัน	ออกดูงานภาคสนาม เข้มสามงูคในเขตพื้นที่ดิน ๓๖๐๐ ไร่	ออกดูงานภาคสนาม	อาหาร: กลางวัน	อธิบายระบบดิน/คูที่มีอยู่แล้วและชี้แจงว่าดินเขตกว้างขวางเท่าใด	บรรยายกำหนดการดำเนินงานดิน/คูใหม่ๆและอธิบายเขตทดลอง ๒ อธิบายระบบ	บรรยายการจัดรูปที่ดินเพื่อการเกษตรและกำหนดการปัจจุบัน
		๒๔	ออกดูงานภาคสนาม เข้มเขตทดลองค	ออกดูงานภาคสนาม เข้มเขตทดลองค	บรรยายหนทางเพื่อจัดรูปที่ดินใหม่ในเวลาต่อไป	อาหารกลางวัน	บรรยายความหมายดิน/คู และการดำเนินงานการจัดรูปที่ดินแก่เกษตรกรตำบลและงานของเขา	บรรยายกำหนดการดำเนินงานดิน/คูใหม่ๆและ การดำเนินงานการจัดรูปที่ดินใหม่ที่จะดำเนินการในภายหน้า	ออกดูงานภาคสนาม เข้มเขตจัดรูปที่ดินใหม่ที่จะดำเนินการในภายหน้า
๕) แผนการปลูกพืช	จัดเตรียมโดยนาย ประเมิน และนายดิศรินทร์ โกสินทร์ ชัยณรงค์ เบ็ญ และ เต็มตัน	๒๔	ประสบการณ์การเกษตร วิชาการเกษตร ในปัจจุบัน ผลจากการดำเนินงานในเขตทดลอง ๑ และ ๓ จนถึงปัจจุบันนี้	เสนอประสบการณ์เกี่ยวกับแผนการปลูกพืชในเขตการชลประทาน	เสนอประสบการณ์เกี่ยวกับแผนการปลูกพืชในเขตการชลประทาน	อาหารกลางวัน	อภิปรายข้อเกี่ยวกับประสบการณ์ของกรมวิชาการเกษตรในเขตโครงการลำน้ำฮฮนและประสบการณ์ที่ได้รับจากการดำเนินงานที่ห้วยสีพัน	เสนอแผนพืช ECIที่ ๖ และบรรยายความสำคัญของการวางแผนการดังกล่าว	เสนอแผนพืช ECIที่ ๖ และบรรยายความสำคัญของการวางแผนการดังกล่าว ต่อการอภิปรายให้สิ้นสุดไป
๖) การค้นคว้าทดลองพืชเพื่อหาพืชที่เหมาะสมและจัดระบบการปลูกพืช	จัดโดยนายประเมิน และนายดิศรินทร์	๓๐	ตรวจสอบบทวนประสบการณ์ด้านระบบการปลูกพืชและค้นคว้าทดลองไม่เขตทดลอง ค ของกรมวิชาการเกษตร	ออกดูงานภาคสนาม เข้มเขตทดลอง ค	ออกดูงานภาคสนาม เข้มเขตทดลองค	อาหารกลางวัน	การ เสนอประสบการณ์เกี่ยวกับแผนการปลูกพืชที่ห้วยสีพัน	อภิปรายความหมายของทุกอย่างที่กำลังมาเกี่ยวกับโครงการชลประทานลำน้ำฮฮนแก่เกษตรกรตำบล	ออกดูงานภาคสนาม เข้มเขตทดลอง ๑

๒๑

วิชา	วิทยากร	วันที่	๐๔.๐๐-๑๐.๐๐	๑๐.๐๐-๑๑.๐๐	๑๑.๐๐-๑๒.๐๐	๑๒.๐๐-๑๓.๐๐	๑๓.๐๐-๑๔.๐๐	๑๔.๐๐-๑๕.๐๐	๑๕.๐๐-๑๖.๐๐
๗) แปลงสาธิตและวิธีปฏิบัติ การจัดการดินพื้ก	นิพนธ์ กรมส่งเสริมการเกษตร ธิดา เป็ด โกอินทร์	พ.ค. ๑	การเสนอแผน และแปลงสาธิต ในเขตเป้าหมาย ของ ๖ ตำบล	การบรรยายถึงแผน เป้าหมายสำหรับเขต สาธิต	การบรรยายโดย ธิดา ในการติดตาม และรายงานเกี่ยว กับการสาธิต	อาหารกลางวัน	ธิดา บรรยายต่อไป และเน้นถึงเรื่อง การรายงาน	การบรรยาย โดย เป็ด ใน ความสำคัญของ การวัดน้ำในระ ดับไร่ นา และ เกษตรกรตำบลนั้น จะมีส่วนช่วย เหลือได้อย่างไร ไร	การสาธิตเกี่ยว กับการวัดน้ำ และการรายงาน
๘) กลุ่มเกษตรกรและสมาชิก ผู้ใช้น้ำ	ชาตรี กรมชลประทาน สันต์สนธิ์ โกอินทร์ โกศล	๑๔	การบรรยาย โดยโกอินทร์ เกี่ยวกับกลุ่มประ เภทต่าง ๆ	การบรรยาย โดย ชาตรี กรม- ชลประทาน ถึงประ สพการณ์เกี่ยวกับ กลุ่มผู้ใช้น้ำ	การบรรยาย โดยโกศล ใน ความสำคัญของกลุ่ม ผู้ใช้น้ำในเขตโครง การชลประทานลำ น้ำตุน	อาหารกลางวัน	การพิจารณาถึง การบรรยายในตบ เข้า และหน้าที่ของ เกษตรกรตำบล	ออกดูงานภาค สนามเป็แม่กลุ่ม แบบ รพช.	ออกดูงานภาค สนาม
๘) สาธิตการปลูกพืชในเขต โครงการชลประทานลำน้ำ ตุน	ทอง วิเชียรเพริศ สันต์สนธิ์ สิริวัณ	๒๐	โครงการปลูกพืช ประเภทต่าง ๆ ที่สนับสนุนโดยกรม ปลูกพืช	ผลที่จะได้รับจาก การพัฒนารูปแบบ พิเศษ	กรมปลูกพืชสามารถ ที่จะช่วยเหลือเกษตรกร ตำบลได้อย่างไร	อาหารกลางวัน	การทดลองในการ ดำเนินงานปลูกพืช ไร่ นา สวน ผสม	ออกดูงานภาค สนามเกี่ยวกับการ ทดลองพิเศษ ไก่ หมู และปลา	ออกดูงานภาค สนาม

**LAM NAM OON INTEGRATED RURAL
DEVELOPMENT PROJECT
KASSET TAMBOL TRAINING
SCHEDULE**

APRIL 7 to JUNE 2, 1980

I. Timing:

April 7,8,9,10 - Lam Nam Oon Training; April 11 - Amphoe
April 14 (Songkran); April 15,16,17 - LNO; April 18 - Amphoe
April 21,22,23 - LNO; April 24,25 - Amphoe
April 28,29,30, May 1 - LNO; May 2 - Amphoe
May 5 to 16 - harvesting
May 19,20,21 - LNO training; May 22,23 - Amphoes
May 26 - 30 Huey Sathon - Kalasin
June 2 - LNO and end of training; June 3,4,5,6 - Amphoe

II. Schedule, Content, and Instructors:

April 7,8,9,10,15,16:

Complete the 450 Household Social Survey for the target Tambols in the Lam Nam Oon area - so that the K.T.'s will have a detailed baseline to use as a reference.

Instructors: Dr. George Hill - Louis Berger Team
Kosin Saisaengchan - Louis Berger Team
Chainarong Butrobol - Louis Berger Team

Location: Begin at Lam Nam Oon Administrative Center and then do field work each day under the guidance of the Instructors.

April 17,21:

The meaning of INTEGRATION in the Lam Nam Oon project, and how the K.T. can benefit from integration activities.

- Each participating Department to explain it's activities and the resources available.
- K.T.'s to be told how they can make use of the resources.

30

- Field visits to those projects close to the Lam Nam Oon Administrative Center - by Departments who wish to show their field activities.

Instructors: Chairman, Assistant to the Project Field

Director: Khun Sansonthit

Team leaders or their representatives.

Location:

Lam Nam Oon Administrative Center, or

Phannikom Meeting Hall (if available)

followed by field visits to various projects

like: the Hi Yong Integrated Training Center,

Department of Fisheries Ponds, a Non-formal

Education Training Class.

April 22

The Soils of Lam Nam Oon - and Land Suitability Maps.

- Give each K.T. a color-coded land Suitability Map with explanation in Thai; and describe the future importance of this tool in planning where to encourage the production of what crops.
- Ask each K.T. to bring his own Tambol map to the lecture and to study how the Land Suitability map relates to his Tambol map - in terms of scale, location of soils, etc.
- Take the K.T.'s to some different soil areas - and show them the general differences in the soils, in the field.
- Review their attempts to plot the Land Suitability soils onto their Tambol maps.
- Later, schedule Dr. Santhad to give a more detailed lecture on the soils.

Instructors: Kosin Saisaengchan, Louis Berger Team

Wm. Bell, Louis Berger Team

E. Coles, Louis Berger Team

J.J. Dalton, Louis Berger Team

Location:

Lam Nam Oon Administrative Center or

Phannikom Meeting Hall (if available)

followed by a field trip.

April 23, 28

Water System Layout and Plans:

- Present the current 72,000 Rai water delivery system. Take the K.T.'s to three different examples of how this system now affects the farmers: good water supply; fair water supply; no water supply.
- Explain the traditional ditch/dike system and show how widespread it is throughout the Lam Nam Oon area.
- Explain Land Consolidation under maximum Reparcelling criteria - and show Pilot Area 3 as an example.
- Describe the areas that are to be further Land Consolidated. Discuss the tentative schedules for development. Explain how new design criteria may be applied in these areas. Explain the probable meaning of all this to K.T.'s who will be working in that area during the next two to three years.
- Describe the need for Pilot Area 2, in terms of helping to design new approaches to ditch/dike construction, and indicate where it will probably be located.
- Link the Pilot Area 2 discussion into the projected RID schedule for altering the Ditch/Dike system in areas other than those which are consolidated. Indicate the probable minimum-maximum time frame; and describe how this situation will affect K.T.'s working in those areas during the next three to five years.

Instructors: Khun Tang of R.I.D. assisted by Khun Virat Khun Charoon and Khun Sansonthit of C.D. E. Coles and W. Bell of the Louis Berger Team

Location: The Lam Nam Oon Administrative Center or Phannikom Administrative Center and field trips.

April 29

Cropping Plans:

- Describe what the Department of Agriculture has already learned about various kinds of crops that may be promoted in the Lam Nam Oon area.
- Describe Irrigation area Cropping Plans, and use Cropping Plan Number 6 as an example of how an irrigation system - to be efficient on mixed kinds of soils - must have general guidelines for selecting crops.

- Distribute a Thai language version of Cropping Plan Number 6 - with the repeated caution that it is not yet final. It is only an illustration of what will be developed in the next two years. Once a Cropping Plan related to sound market prospects and soil/water conditions is developed - it may then be used in about two years from now as a general guideline.

Instructors: Chosen by DOA

Personnel from Huey Sathon

Kosin and Chainarong - Louis Berger Team

J.J. Dalton - Louis Berger Team

Location: Lam Nam Oon Administrative Center or
Phannikom Administrative Center (if available)
and field visits.

April 30

Cropping systems and Crop Research:

- Explanation by Department of Agriculture personnel of experience with cropping systems at Lam Nam Oon.
- Explanation by Upland Crop, Rice, and Horticulture crop personnel about their research experience in the area - and future plans.

Instructors: Chosen by DOA and DOAE

Location: Lam Nam Oon Administrative Center or
Phannikom Administrative Center (if available)
and in the field.

May 1

Demonstration Plots and Records Management:

- Explanation of Department of Agricultural Extension work with Demonstration Plots in the Lam Nam Oon area.
- Lecture on importance of constant contact with Demonstration Plot farmers, and keeping records on their progress.
- Description of how water measuring can be introduced in Demonstration Plots - and how this needs constant records-keeping.
- Description of various kinds of records keeping and some recommendations.
- Visit to some illustrative Demonstration plots in the area.

Instructors: Khun Niphan - DOAE
Hill - Louis Berger Team
Bell - Louis Berger Team
Kosin - Louis Berger Team

May 5 to 16: Time off for Harvesting

May 19

Farmers organizations and Water User's Associations.

- Kinds and types of organizations.
- Importance of water user's associations of some kind.
- Experience of RTG with Water User's Associations.
- What the KT can do to help in this entire matter.

Instructors: Khun Chatri - RID
Khun Kosin - Louis Berger Team
Khun Sansonthit - CD
Coles - Louis Berger Team

Location: Lam Nam Oon Administrative Center

May 20

Livestock Development Needs in the Lam Nam Oon area

- The kinds of livestock development that should be done.
- How the K.T.'s can be assisted by Livestock
- Tri-commodity kinds of experiments for Lam Nam Oon

Instructors: Khun Kong Vichienpred, Livestock Department.

Khun Sansonthit - CD
Khun Natavudh - DOA

Location: Lam Nam Oon Administrative Center, and
field trip.

May 21

Pesticide and Insecticide Problems in an Irrigated Area

- Why, generally, there are more problems in an irrigated area in the Dry Season.
- The kinds of resources that can help the K.T.'s.
- The types of special problems that can be expected to arise.

36

Instructors: Khun Chainarong Butrobol - Louis Berger Team
Chosen by DOAE & DOA

May 26-30

K.T.'s go to Huey Sathon, Kalasin Farm, for one week of special training on water use management.

June 2

Course concludes at Lam Nam Oon

- Results of Household Social Survey are reviewed.
- Team Leaders appear to answer questions.
- Discussion of the kinds of additional special training needed in the next Dry Season.

Instructors: Team Leaders

Hill	- Louis Berger Team
Khun Kosin	- Louis Berger Team
Khun Chainarong	- Louis Berger Team
Bell	- Louis Berger Team
Coles	- Louis Berger Team

Location: Lam Nam Oon Administrative Center

cc: Roongrueng Chulajata, Field Project Director
Wm. Bell
E. Coles
G. Hill
Kosin Saisaengchan
Chainarong Butrobol
F. Gillespie - AID
P. Gajewski - East Orange

III

Detailed Schedule
and Instructors

Subject	Instructors	Date	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:30
1) Household Survey	Hi Kosit, Chainarong	April 7	LMO Administrative Center	LMO Administrative Center	LMO Administrative Center	Lunch	Field Work	Field Work	Field Work
	Hi Kosit, Chainarong	8	Phannikom Meeting Hall	Phannikom Meeting Hall	Field Work	Lunch	Field Work	Field Work	Field Work
	Hi Kosit, Chainarong	9	Phannikom Meeting Hall	Phannikom Meeting Hall	Field Work	Lunch	Field Work	Field Work	Field Work
	Hi Kosit, Chainarong	10	Phannikom Meeting Hall	Phannikom Meeting Hall	Field Work	Lunch	Field Work	Field Work	Field Work
	Hi Kosit, Chainarong	15	Phannikom Meeting Hall	Phannikom Meeting Hall	Field Work	Lunch	Field Work	Field Work	Field Work
	Hi Kosit, Chainarong	16	Phannikom Meeting Hall	Phannikom Meeting Hall	Field Work	Lunch	Field Work	Field Work	Field Work
2) Meaning of Integration	Khan Sansonthit and Team Leaders or their representatives	April 17	Describe Role of 8 Departments	Describe Role of 8 Departments	Describe Budgets of each Departments in LMO	Lunch	Visit Fish Pond Demonstration	Visit Fish Pond Demonstration	Free
		April 21	Visit C.D. Integrated Training Center Hi Yong	Visit C.D. Integrated Training Center Hi Yong	Visit Non-Formal-Education Training Class	Lunch	Describe future plans of each Dept.	Review Problems of LMO Project	Discussion
3) Soils of Lam Nam Com	Kosit, Bell, Coles, Dalton	April 22	Describe Different Soils of LMO-and Distribute Land Suita-	Discuss use of Land Suitability Map	Ask K.T.s to draw soil lines on their Tambol Maps	Lunch	Continue line drawing Exercise	Field visit to different kind of soils	Field visit to different kinds of soils

III

Detailed Schedule
and Instructors

Subject	Instructors	Date	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:30
4) Water System Layout & Plans	Khun Tang, Virat, Charoon-RID Khun Sansonthit, C.D. Coles, Bell	April 23	Map show, and description of present 72,000 rai receiving water	Field visit to three loca- tions in 72,000 Rai area	Field visit	Lunch	Explain traditional ditch/dike system and show how much area it occupies	Describe schedules for new ditch/ dike work and explain new Pilot Area 2	Describe land conso- lidation and the project schedule
		April 28	Field visit to Pilot Area 3	Field visit to Pilot Area 3	Discribe proposed new approach to land con- solidation	Lunch	Discuss meaning of ditch/dike and land consolidation work to K.T.'s and their work	Discuss new systems, soils, in all areas	Field visit to proposed new land consolidation area
5) Cropping Plans	Arranged by Prarn DOA and Niphan Kosin & Chainarong Bell and Dalton	April 29	Present DOA experience, results from Pilot Area 1 and 3 to Date	Present Huey Sathon experience with cropping plans in irrigated area	Present Huey Sathon experience with cropping plans in irrigated area	Lunch	Continue discussion about DOA experience in LNO and Huey Sathon Ex- perience	Present ECT Crop Plan #6 and describe importance of such planning	Complete discussion
6) Cropping systems and crop research	Arranged by Prarn DOA and Niphan DOAE	April 30	Review of DOA experience with cropping systems and crop research Pilot Area 3	Field visit Pilot Area 3	Field visit Pilot Area 3	Lunch	Presentation Huey Sathon experience with cropping plans	Dis cussion of meaning of all this, for K.T.'s in LNO Area	Field visit Pilot Area 1

6/11

III

Detailed Schedule
and Instructors

Subject	Instructors	Date	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:30
7) Demonstration Plots & Records MGMT.	Niphan-DOAE Hill Bell Kosin	May 1	Presentation of DOAE demonstration plans/plots in 6-Tambol Target Area	Description of future plans for demonstration work	Lecture (by Hill) on demonstration follow-up and reporting	Lunch	Continue lecture (by Hill) with emphasis on reporting.	Lecture (by Bell) on importance of measuring water at farm field level and how K.T.'s can help	Field demonstration of measuring and reporting
8) Farmer's organization and water users association	Chatri-RID Sansonthit Kosin Coles	May 19	Lecture (by Kosin) on kinds and types of organization	Lecture (by Chatri) on R.I.D. experience with water user organization	Lecture (by Coles) on importance of water use organization at LNO.	Lunch	Discussion of morning presentation and duties of K.T.'s	Field visit ARD-style organization, Warichiphum	Field visit
9) Livestock Development needs in LMO area	Khun Kong Vichienpred Sansonthit-C.D. Matavudh-DOA	May 20	Kinds of Livestock Program supported by Livestock Dept.	Special Livestock Development	How the K.T.'s can be assisted by Livestock Dept.	Lunch	Experiments in Livestock work - Tri-commodity	Field visit to special special experiments with poultry, pigs & Fish	Field visits

of

III

Detailed Schedule
and Instructors

Subject	Instructors	Date	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:30
10) Pesticide and insecticide problems in an irrigated area	- Chainarong Butrobol - Specialist to be arranged by Khun Niphan	May 21	Dry season problems with insects and pests	Various kinds of preventive programs	Insect pest indications of possible major problems	Lunch	Ways by which K.T. can be assisted in controlling insects and pests	Field visits to areas with problems	Field visits to areas with problems
11) K.T.'s in training at Huey Sathon		May 26 to 30							
12) Closing day	Team Leaders Hill Kosin Bell Chainarong Coles	June 2	Preliminary review of results of social survey	Discussion of key points made in training	Team Leaders answer questions	Lunch	Discussion of future training needs	Free	Free

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Ref. No. LBII/178

March 18, 1980

Khun Amphan Punnakant
Deputy Director General
R.I.D.
Sam Sen Road
Bangkok

Ref: LAM NAM OON INTEGRATED RURAL DEVELOPMENT PROJECT
CONTRACT BETWEEN MINISTRY OF AGRICULTURE AND
COOPERATIVES AND LOUIS BERGER INTERNATIONAL, INC.
(A.I.D. LOAN AGREEMENT NO. 493-T-020)

Subject: REQUESTED TIME CHANGES IN EXPATRIATE AND THAI
PROFESSIONAL STAFF (REF. SECTION 6 (b), PAGE 5
OF CONTRACT)

There is an urgent need to alter the time periods
for a number of expatriate and Thai professional staff.

The need arises out of an analysis of the technical
advice that is needed, particularly in Engineering and
Agricultural Extension.

Under the present schedules, the Water Management
and O & M engineer, Mr. Erroll Coles, will only be at Lam
Nam Oon for 12 months. Considering that Pilot Area 2 has
yet to be selected and water management tests designed and
evaluated so that later expansion can occur, this is much
too short a time.

Similarly, the expatriate Agricultural Extension advice
is limited to six months; and a similar limit is placed on the
Thai Professional Rural Development staff. This limit allows
such staff to work on the project only in the dry season of
December 1979 to June 1980. What is needed, in a second crop
irrigation project of this kind, is Agricultural Extension advice
for at least two more dry seasons. That is, the period from
November, 1980 to May 1981, and November 1981 to May 1982.

This is particularly important at Lam Nam Oon because
previous studies in which the Thai Government has invested
much money (Eg. The ECI Report) show the importance of fitting
crops to soil and water conditions. Agricultural Extension
Agents must be trained in these matters; and the Louis Berger
Team can do that. Therefore, I believe it is critical to
the future of the project to rotate Louis Berger Agricultural
Extension, and Rural Development advisors in and out - for dry
season coverage - for at least two more dry seasons.

There is need to do this, too, because what a water management engineer like Coles can teach is related closely to water applications, soils, crops - and Agricultural Extension. The engineer, by staying steadily through dry and wet seasons can plan the water-related training which the Agricultural Extension specialists can provide to the Kasset Tambols in the Lam Nam Oon area.

Under these circumstances, I request that the timings be changed so that the total team time remains the same; but the time would be redistributed as follows.

<u>Expatriate</u>	<u>Present</u>	<u>Proposed</u>
J.J. Dalton Team Leader	36	23
William Bell System & On-farm Engineer	40	32
Erroll Coles Water Mgmt. & On-farm irrigation Engineer	12	24
George Hill Agricultural Extension Advisor	6	18
Paul Maynard Rural Development Advisor	6	3
All others (expatriate)	<u>6</u>	<u>6</u>
	106	106
<u>Thai Professional Staff</u>		
Chainarong Butrobol Ag. Extension Advisor/ Agron.	15	10
Kosin Saisaengchan Rural Development Specl.	6	12
Dr. Saathad Rojanasoothan Soil Scientist	2	2
Chairat Monaiyapong Farm Institution Specialist	2	1
Dr. Phadej Sauasditotr Irrigated Agricultural Development Specialist	2	2

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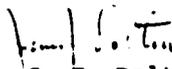
- 3 -

<u>Thai Professional Staff</u> (Continued)	<u>Present</u>	<u>Proposed</u>
Dr. Boon Indrambarya Fisheries Specialist	<u>2</u>	<u>2</u>
	29	29

A decision on this request is particularly urgent for Dr. Hill and Khun Kosin Saisaengchan. Their present six-month tours end in June, 1980. If they know, now, that they can return in November or December 1980, they can plan their present work so that it merges nicely with that of the next dry season.

Further if they cannot return it is highly unlikely that during the next two months they can sufficiently train the Kasset Tambols - who have just now (March, 1980) been assigned to Lam Nam Oon.

Sincerely yours,
LOUIS BERGER INTERNATIONAL, INC.


J. J. Dalton
Team Leader

JD:nlp

cc: Roongrueng Chulajata
Frank Gillespie - USAID
Peter Gajewski - Bangkok

CHAPTER II

MAJOR EVENTS DURING THE QUARTER

- 2.1 It is difficult to evaluate all of the events which took place during this quarter. Probably the most important happening, from the standpoint of concentrating high-level Bangkok attention on the project was the day-long visit of Dr. Anat, Deputy Minister of Agriculture, and a large ministry staff of senior officials on April 20, 1980. This visit produced assurances that several problems peculiar to the project will be reviewed soon.
- a) Problem of marketing
 - b) The possibility of introducing program budgeting so as to strengthen the integrated aspects of the project.
 - c) Staffing to support integrated planning, implementation, and reporting.
 - d) Increased stress on irrigated agriculture training for personnel associated with the project.
- A special review team is to visit Lam Nam Oon in early May, 1980 and start work on these various matters.
- 2.2 Another equally important event was the decision to end Roongrueng Chulajata's tour of duty as Field Project Director on July 15, 1980. At the same time, it was decided to start phasing-in his replacement, Vichai Sa-Nganpibul as soon as possible, after May 15, 1980.
- 2.3 In terms of Technical engineering content and criteria the day-long session of April 15, 1980 with Boonthai Utakananta, Director of Technical Engineering R.I.D. and his staff produced significant results. The relevant Preliminary Draft Criteria recommended by the Louis Berger Advisory Team are provided in Annex A. Their implications, in Terms of the existing Chao Phaya Model and the proposed tertiary canal-bloc parcelation model are shown in Charts A and B attached.
- The resultant discussions produced design criteria based, essentially on the Chao Phaya Model: but with land levelling and land clearing minimised. These are reflected in the details of Annex B attached.
- 2.4 A series of memoranda and discussions during the month of March also produced much progress with the Department of Agricultural Extension. These resulted in approval of a special Kaset Tambol Training Program for April-May 1980. This program was given full support by Niphan Prachantasen, Kaset Changwat, Samon Nakhon; and training began on April 21, 1980.
- 2.5 Support was also provided by the Department of Agricultural Extension for completion of the 450 household social survey for the six tambols of concentration in the Lam Nam Oon area. All field work on this was completed during the period and the tabulating of results together with analysis of data is taking place during May, 1980. Completion of this analysis will provide the first local-specific social set of benchmarks for reference by project planners.

- 2.6 Work with the Department of Agriculture continued to prosper. Dr. Prakorb, the Director General of this Department, visited the project twice during the quarter. Technical personnel from Bangkok constantly visit the applied research and seed multiplication activities. These are centered, to some extent, on Pilot Area 3; but as can be noted from the details in Annex C, attached, they include areas of the six target tambols (Chan Ming, Wang Yang, Rai, Phanna, Hi Yong, and Pok Noi). Annex C also contains a list of the names of the 12 Department of Agriculture professional personnel associated with this project.
- 2.7 Other developments which arose particularly out of the March-April visit of the project coordination, Vice President Peter Gajewski of Louis Berger International, Inc. included:
- a) A decision to accept Dr. Vergara, an Agricultural Economist, as a short-term advisor to the project with particular focus on marketing problems-in July, 1980.
 - b) The activation of contract with one of Thailand's leading soil scientists - Dr. Santhad Rojanasoonthon.
 - c) Speeded processing of a contract amendment related to staff furnishings needs at Lam Nam Oon.
- 2.8 Work begun during the previous quarter on financial plans, work plans for 1980 was completed during this quarter.

The last remaining work plan and financial plan: that of the Department of Agricultural Extension was completed at Sakon Nakhon on April 21, 1980. It is attached as Annex D.

These various documents now provide the basis for programming by the various participating agencies; and it is to be hoped that similar planning for the 1981 fiscal year will be hastened through the experience earned to date.

- 2.9 A summation of progress of project work during the quarter would emphasize the following:
- A. Engineering:
- 1) Agreement of April 21, 1980 upon a work plan for engineering design and specifications - see Annex E.
 - 2) Selection of Pilot Area 2 for development of test models in Ditch/Dike operations (see Annex B, Chapter I).
 - 3) Land levelling modified as result of Boonthai conference of April 15, 1980.
 - 4) Operations and maintenance survey scheduled
 - 5) Drainage data to be presented at Lam Nam Oon by May 19.

B. Rural Development

- 1) Kaset Tambols now provided with ECI area cropping plan number 6, in Thai, and individual copies of the Land Suitability Maps.
- 2) Dr. Santhad Rojansoonthon, Soil Scientist, beginning to address attention to the project.
- 3) Chinat experience in Land Consolidation observed by Bell and Coles.
- 4) Training program for Kaset TAMBols designed and started.
- 5) Reviewing crop research plans for dry season 1980/81 with Department of Agriculture.
- 6) Marketing specialist selected for work starting in July, 1980.
- 7) Management-organization: No action

C. Evaluation

- 1) First social base-line study inside 6 tambol target almost finished.
- 2) Inventory of existing reporting/information systems not complete.
- 3) Involvement of target populations: (in planning, evaluation, implementation) - none
- 4) Training (in evaluation) - none.

April 3, 1980

To: Rongrueng Chulajata
Field Project Director
Lam Nam Con Integrated Rural Development Program

Subject: Preliminary Draft

From: James J. Dalton, Team Leader, Louis Berger International, Inc.
Advisory Team (Technical Advisors: E. Coles and W. Bell)

As we agreed on March 25, 1980 we have prepared a Preliminary Draft as of this date. This Preliminary Draft concerns suggested changes in future RID survey, design, and engineering work among areas targetted for Land Consolidation.

The immediate areas to which attention is addressed concerns Tambols Rai and Wang Yai, Amphoe Phannanikom, Sakon Nakhon in the 1980/81 Construction Season.

The advisory team suggests new policies and criteria for the design and construction of water delivery and land levelling practices in those areas.

This Draft is submitted to you on the understanding that it is Preliminary. The contents will be further detailed and defined by the Louis Berger Team prior to April 14, 1980.

By that time, it is hoped that a more complete product together with views that you and your colleagues voice about this Preliminary Draft will result in some policy decisions and a Program of Action for the next six months.

I

Executive Summary

There are two principal points of emphasis in this Preliminary Draft:

A. Lower the costs per Rai:

Present experience in Pilot Area 3 indicates that costs of land levelling, canal dimensions, road density, road standards and drainage works are in excess of Baht 6,000 per Rai.

This appears to be an insupportable level of expenditure for the Royal Thai Government if similar standards and systems are extended to many thousands of Rai in the project area.

THEREFORE, the Louis Berger Team suggests that the following policies be adopted for application to Land Consolidation areas during the 1980/81 Construction Season:

1. Only a limited amount of land be cleared.
2. Minimize land modification.

3. Limit re-parcelling of properties.
4. Maximise economic use of water and minimize management requirements.
5. Limit the density of irrigation infrastructure.

B. Equalize Opportunities for Economic Growth:

Observation of Pilot Area 3 indicates that maximum re-parcellation and the levelling of soils which are marginally productive could be construed as a form of economic discrimination against those farmers in the Low Man Con area who will not benefit from such heavy RPO investments per Rai of farm developed. Furthermore, the water delivery system that has been designed for this area does not lend itself, easily, to economic and equal distribution of water to all farmers.

THEREFORE, the Louis Berger Team suggests that the following policies be adopted for application to Land Consolidation areas during the 1990s/01 Construction Seasons:

1. Only those areas of land with a optimum economic potential should benefit from water deliveries in a minimum of time.
2. Design delivery systems which occupy minimal amounts of usable land and provide adequate and equitable supplies of water to blocks of farms and individual units.
3. Future improved water delivery and use must be promoted throughout the Low Man Con area by giving careful attention to what is designed and operated in the Land Consolidation area.

II

General Criteria for Land and System Selection

Which areas are to be selected for development, what will be the intensity of that development, what kinds of systems of water delivery, and what kinds of cropping programs are to be installed in the area are vital issues.

The Louis Berger Team suggests that these issues be approached cautiously, with particular attention focussed upon factors involving economic equality and low costs.

Accordingly, its RECOMMENDATIONS:

A. Minimized unit cost through:

1. Minimal Land Clearing:

- a) Policy:

Establish three categories of Land Clearings

- Category A) - Land that is mostly cultivated paddy or upland crop fields with little or no trees and/or scrub vegetation.
- Category B) - Land that, for the most part, is cultivated paddy or upland crops but has scattered areas of trees and/or scrub vegetation.
- Category C) - Land that is mostly trees and/or scrub vegetation with little or no cultivated paddy or upland crops.

b) Criteria:

- Each block or sub-unit in the Land Consolidation program will be selected to include as much of Category A as possible.
- In a case where the system would be enhanced and/or made more efficient if part or all of an area of Category B were included, the decision will be left to the designer after considering such factors as:
 - extra cost of clearing per Rai,
 - total area involved,
 - potential productivity of the soils,
 - socio-political aspects, etc.
- Some areas in Category C within Land Consolidation areas will be deferred in terms of expenditure of Royal Thai Government funds for development. Further economic, technical, and social studies will be made and the facts derived will be used when deciding what portions of Category C lands may be excluded from future development.
- Design of water delivery systems that may in the future serve portions of Category B or C lands will be such that no major modifications will be required if and when such areas are included for development under the Land Consolidation program.

2. Minimal Land Levelling:

a) Policy:

Land levelling, in general, will be kept to a minimum because of cost and system efficiency factors.

b) Criteria:

- Water distribution system will closely follow topographic features.
- Total volume of cut will be minimal.
- With authorized local exceptions, earth fill will only be taken from borrow pits.
- In cases where the above is not economical and adjacent paddy lands have high spots, fill can be taken provided top soil is first removed, stockpiled, and later replaced.

- For any land levelling the soil profile must be known.
- In cases of very shallow top soils, land levelling will not be done.
- Post land levelling requirements will be generated only from levelling needed as a result of minor realignment of some farm boundaries.
- No land levelling will be done in order to lower farm elevations so that farms can be served from existing canals.

3. Minimum Reparcelsation of Land:

a) Policy:

The objective will be to design a 'balanced' system of canals/drains/roads/fields and efficient farms. A minimal degree of reparcelsation is essential in order to accomplish this.

b) Criteria:

- "Block" reparcelsing, as contrasted to the present mixed up reparcelsation done in Pilot Area 3, will be applied to the land consolidation area.
- Property boundaries will be viewed in the context of the topography and "blocks" laid out accordingly.
- Realignment will be done only between a limited number of parcels in one "block".
- Canals/drains/roads will be planned along property boundaries and "block" alignments wherever possible.

4. Finalized scenario and distribution of water through:

1. Design of a reliable, equitable, water delivery system:

a) Policy:

Foster the design of an on-farm irrigation system which provides sustained, certain, and equitable water supplies to each farm in the shortest possible time and within reasonable budget limitations.

b) Criteria:

- Supply measured quantities of water to every farm unit at regular times corresponding to the growing season.
- Canals/drains and other installations take up only a minimal area of usable land.
- Management ease both for H.S.D. and the individual farmer.
- Fit into existing land use patterns without major disruption.
- Minimum of consolidation and realignment of farm boundaries.
- Provide for rotational water supply.

2. Adopt a Tertiary Unit system:

a) Policy:

Design and apply this type of system because it can maximize the area of land to benefit from water deliveries with a minimum of management.

b) Criteria:

- Adopt an optimum Tertiary Unit size of 950 Rai.
- Divide the Tertiary Unit into pairs of Quaternary Units, of approximately equal area.
- Adopt an optimum Quaternary Unit size range from 60 to 125 Rai.
- Regulate and measure water at offtakes to Tertiary Units; and utilize Tertiary Division Boxes and Quaternary Division Boxes as further measuring devices.
- Deliver water to individual farm units.
- Determine maximum irrigation requirements and define minimal canal requirements accordingly.
- Develop and apply other specific technical criteria.

III

Specific Technical Criteria

- | | |
|-------------------------|-------------------|
| A. "Block" Parcelation | - to be developed |
| B. Tertiary Unit system | - to be developed |
| C. Land Levelling | - to be developed |
| D. Drainage System | - to be developed |
| E. Roads | - to be developed |
| F. Structures | - to be developed |
| G. Miscellaneous | |

IV

Procedures for Development

To be developed

V

Training

Schedules and Curricula to be developed.

Best Available Document

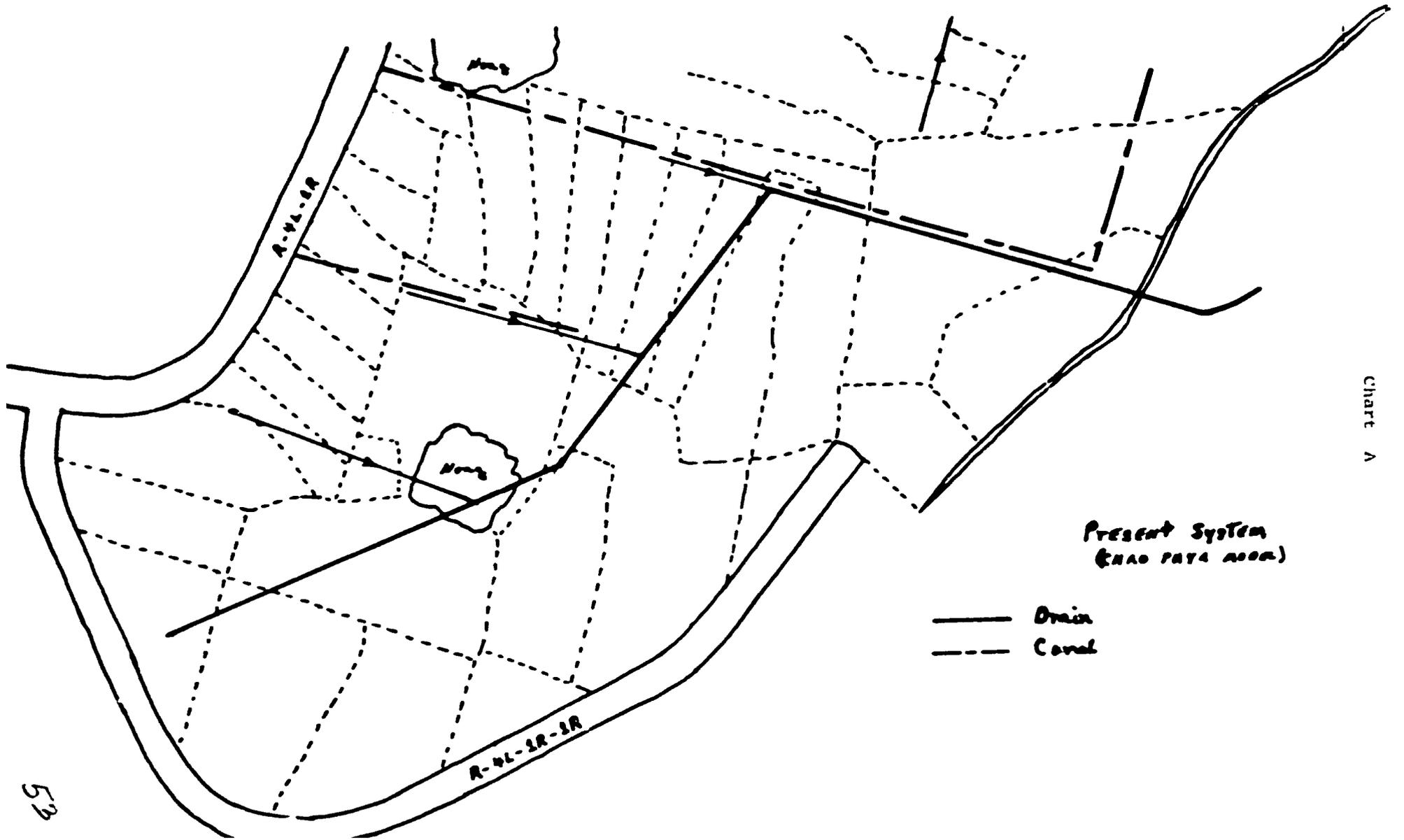


Chart A

Present System
(KHAO PATA NONG)

- Drain
- - - Canal

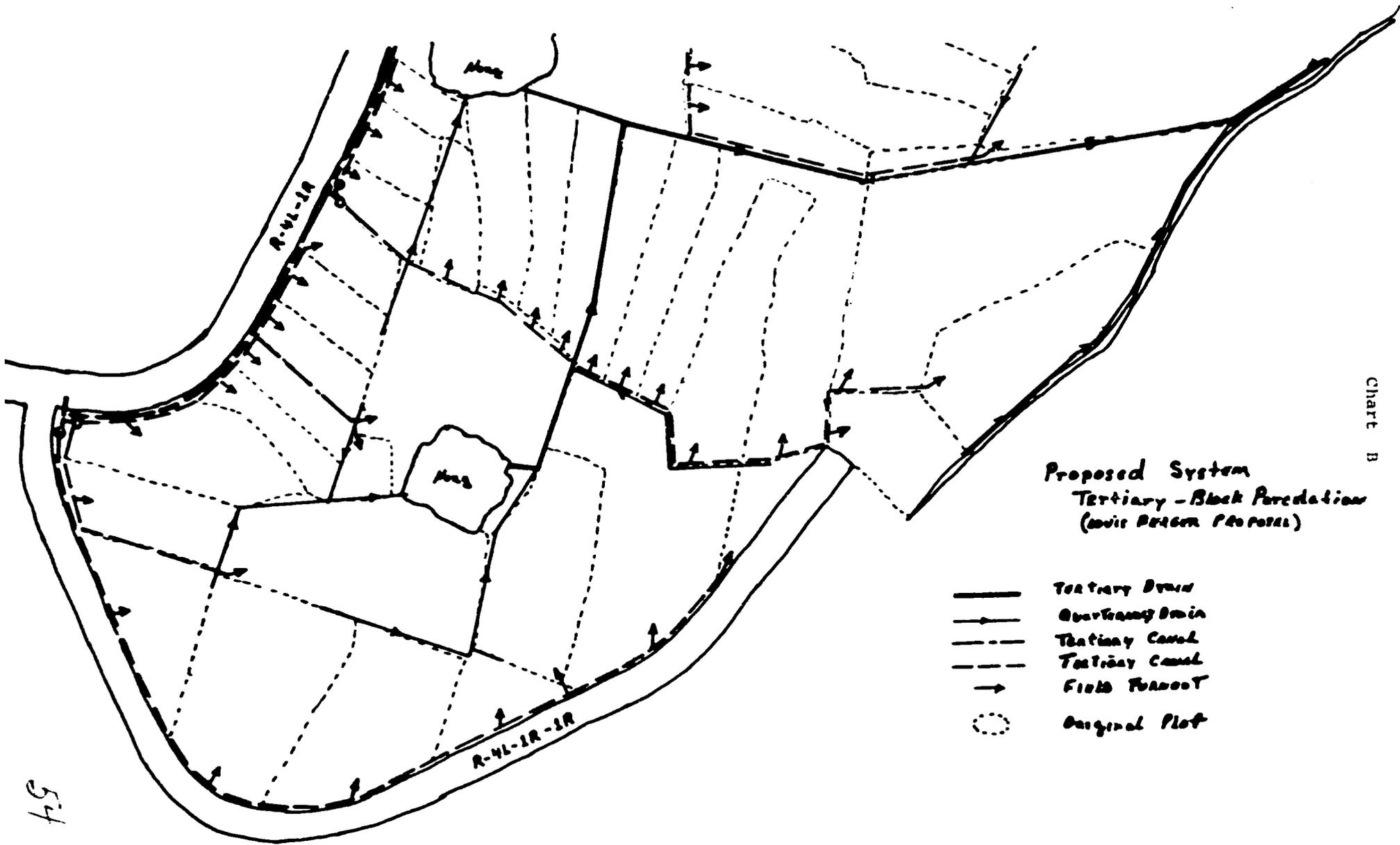


Chart B

Proposed System
 Tertiary - Block Percolation
 (over Basin Proposal)

- Tertiary Drain
- > Overlying Drain
- - - Tertiary Canal
- - - Tertiary Canal
- Field Furrow
- Original Plot

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Annex B

April 15, 1980

Reongruang Chulajata
Project Field Director
Lam Nam On Integrated Rural Development Project
Amphoe Phang Khon
SAKON NAKHON

SUBJECT: April 15, 1980 Meeting with Boonthai Otakananta,
Director of Technical Engineering - RID

FROM: James J. Dalton, Team Leader, Louis Berger International, Inc.

Thank you for arranging the four-hour design review with the senior RID staff.

I understand that the following decisions were reached in that meeting:

1. The proposed tertiary-quarternary and minimization model was rejected for application to the next 10,000 rai Land Consolidation area because:
 - a. It was not clear, in the model, how the minimal boundary realignments proposed could be made acceptable to the farmers, particularly those on small farms - when canals, roads, and drains space was factored into calculations about net loss from each holding.
 - b. Although the costs for the proposed model seemed somewhat lower per rai, they did not seem to be strikingly so. Therefore it was preferred to continue using the Chao Phaya model (also called the ILACO, Dutch, and Pilot Area 3 model) with certain key modifications.
 - c. Although it was accepted that the tertiary-quarternary model may provide better control of water, it was agreed that an attempt should be made to see if the Chao Phaya model could be modified to do this in some degree.
2. While endorsing the Chao Phaya model for application to the next 10,000 rai of Land Consolidation, Boonthai Otakananta made the following alterations in existing criteria:
 - a. Land clearing will be minimized, and in this connection Category A, B, and C will be accepted as a general guideline.
 - b. Land levelling will be minimal; and the Berger Team understands that this means also that:-
 - canals will be designed according to the "critical field level" - the highest point in the area served by the canal
 - lands at present too high to be served will not be included

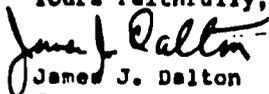
- individual paddies within adjusted boundaries to remain "as is" wherever possible.

3. The Louis Berger International, Inc. advisory team will assist in the formulation of standards and specifications for the Chao Phaya model (modified) application that is to be done by private contractors. Material on this must be completed by July 1, 1960. (A separate memo to you describes certain procedural steps that should be taken immediately.)
4. It was agreed that, as quickly as possible, the tertiary-quarternary model should be tested out in the new Pilot Area 2 - preferably in this coming Dry Season.

Messrs. Bell and Coles will now begin working on the follow-ups to items (2), (3), and (4) above.

Your continued close cooperation will be much appreciated.

Yours faithfully,



James J. Dalton
Team Leader
Louis Berger International, Inc.

cc: Boonthai Otakenanta, Director of Technical Engineering - RID
Arphen Punnokant, Deputy Director General, RID
Frank Gillespie, USAID
Peter Gajewski, Vice President, Louis Berger International, Inc.
E. Coles
W. Hall
G. Hill
Kosin Seiseanchan
Chainarong Butrobol

Annex C

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
INTEGRATED RURAL DEVELOPMENT PROJECT LMO IRRIGATION PROJECT, SAKON NAKHON
DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION				FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE	MU NO.		NAI (MR.)	NANG (MRS.)			
A. High Yield Test on Rice and Economic Crops (Total Sub-project 26 sites)										
1. <u>Rice High Yield One Farm Test</u> (Total 5 sites)										
Pannanikom	Wang Yang	Wang Yang	1	1.1	Nai Sin Thiwato		3.86	Kaw Khaw 7	Technical Division	
		Chang Ning	2	1.2	Nai Boonruang Hassaraj		2.18	Kaw Khaw 7		
		Oom Phai	5	1.3	Nang Bualee		2.54	DR 1030-28-1-5		
		Chang Ming	12	1.4	Nai Nark Nilkhet		2.25	Kaw Khaw (irradiated)		
Phang Khone	Hai Yawng	Hai Yawng	1	1.5	Nai Leuam Sapso		<u>2.56</u>	Kaw Khaw 7		
							Total	<u>13.39</u>		
2. <u>On-farm Test on Rice Management Packages</u> (Total 2 sites)										
Phang Khone	Rae	Rae	1	2.1	Nai U Leethong		1.02	Kaw Khaw 7	Cancelled due to Water Shortage	
	Hai Yawng	Nong Chote	3	2.2	Nai Phet Munchit		3.00	Kaw Khaw 1 (irradiated) Kaw Khaw 7		
		Hai Yawng	1	2.3	Nai Leuam Sapso		<u>1.74</u>	Kaw Khaw 3		
							Total	<u>5.76</u>		
3. <u>On-farm Test on Germinated Direct Seeding</u> (Total 1 site)										
Pannanikom	Wang Yang	Wang Yang	1	3.1	Nai Sin Thiwato		1.14	Kaw Khaw 7		
Phang Khone	Rae	Rae	1	3.2	Nai U Leethong		<u>1.02</u>	Kaw Khaw 7	Cancelled	
							Total	<u>2.16</u>		

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
INTEGRATED RURAL DEVELOPMENT PROJECT LNO IRRIGATION PROJECT, SAKON NAKHON
DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION				FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE	MU NO.		NAI (MR.)	NANG (MRS.)			
4. Varietal and Cultural Practices Test for Mungbean in Farmer's Fields (Total 1 site)										
	Pannanikom	Wang Yang	Puay	2	4.1	Nai Cheun Khantiyu		1.0	Native/U Thong 1	Sub-project No. 4-8 Done by Field Crops Division
5. Varietal and Cultural Practices Test for Soybeans in Farmer's Fields (Total 2 sites)										
	Pannanikom	Wang Yang	Puay	2	5.1	Nai Meechai Suwan		1.0	Saw Chaw 4	
			Wang Yang	1	5.2	Nai Chalong Fonsorn		<u>1.0</u>	Saw Chaw 4	
						Total		<u>2.0</u>		
6. Varietal and Cultural Practices Test for Ground Nuts in Farmer's Fields (Total 1 site)										
	Pannanikom	Wang Yang	Wang Yang	1	6.1	Nai Wandi Khantiyu		1.0	Hainan 9	
			Puay	2	6.2	Nai Na Khantiyu		<u>1.0</u>	Hainan 9	
						Total		<u>2.0</u>		
7. Varietal and Cultural Practices Test for Corn in Farmer's Fields (Total 1 site)										
	Pannanikom	Wang Yang	Wang Yang	1	7.1	Nai Cheun Khantiyu		1.0	Glutinous Rice	
8. Varietal and Cultural Practices Test for Cotton in Farmer's Fields (Total 1 site)										
	Pannanikom	Wang Yang	Puay	2	8.1	Nang Song Konphaeng		1.0	Tak Fa	

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
 INTEGRATED RURAL DEVELOPMENT PROJECT LNO IRRIGATION PROJECT, SAKON NAKHON
 DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION			MUNICIPALITY NO.	FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MUQBAN VILLAGE			NAI (MR.)	NANG (MRS.)			
9. Yield Test for Chili in Farmer's Fields (Total 7 sites)										
Pannanikom	Wang Yang	Wang Yang	1	9.1	Nai Virathai Fongorn		1.0	Huey Sithon	Sub-project No.	
			1	9.2	Nai Viraphon Fongorn		1.0	Huey Sithon	9-12 done by	
		Puay	2	9.3	Nai Khaem Fongorn		1.0	Huey Sithon	Horticulture	
				9.4	Nai Pon Khantiyu		0.75	Huey Sithon	Division	
				9.5	Nai Boonthai Bhromsena		1.0	Huey Sithon		
				9.6	Nai Saengthong Thiwato		1.0	Huey Sithon		
				9.7	Nai Sao Sutthawat		<u>1.5</u>	Huey Sithon		
					Total		<u>7.25</u>			
10. Yield Test for Egg Plant in Farmer's Fields (Total 4 sites)										
Pannanikom	Wang Yang	Wang Yang	1	10.1	Nai Virathai Fongorn		1.0	Khon Kaen		
		Puay	2	10.2	Nai Khaem Fongorn		0.5	Khon Kaen		
				10.3	Nai Pon Khantiyu		0.25	Khon Kaen		
				10.4	Nai Sao Sutthawat		<u>0.5</u>	Khon Kaen		
					Total		<u>2.25</u>			
11. Yield Test for Red Onion in Farmer's Fields (Total 1 site)										
Pannanikom	Wang Yang	Wang Yang	1	11.1	Nai Virathai Fongorn		0.5	Si Saket		
12. Yield Test for Garlic in Farmer's Fields (Total 1 site)										
Pannanikom	Wang Yang	Wang Yang	1	12.1	Nai Virathai Fongorn		<u>0.5</u>	Native		
					Total		<u>38.81</u>			

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
 INTEGRATED RURAL DEVELOPMENT PROJECT LMO IRRIGATION PROJECT, SAKON NAKHON
 DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION				FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE	MU NO.		MAI(MR.)	MANG(MRS.)			
B. <u>On-farm Test on Rice-based Cropping System</u> (Total 2 Sub-projects - 4 sites)										
1. <u>Test on Cropping Patterns in Farmer's Fields</u> (Total 3 sites)										
Pannanikorn	Wang Yang	Puay	2	1.1	Nai Thong Thiwato		3.75	Rice(Kaw Khaw 1)-Ground Nuts (Hainan 9)	Sub-project No. 1-2 done by Technical Division	
Phang Khone	Rae	Rae	1	1.2	Nai Boontawn Phanpinit		3.5	Rice(Kaw Khaw 1)-Ground Nuts (Hainan 9)		
	Hai Yawng	Mong Chote	3	1.3	Nai Kamphu Ornsurathum		<u>5.5</u>	Ground Nuts (Hainan 9)- Rice		
					Total		<u>12.75</u>			
2. <u>Test on Cropping Patterns in Farmer's Fields</u> (Total 1 site)										
Pannanikorn	Wang Yang	Wang Yang	1	2.1	Nai Boontawn Khantiyu		2.5	Rice(Kaw Khaw 1) - Ground Nuts, Bush Bean, Muang Bean, String Bean, Corn.	Cancelled due to farmer did not pay attention	
	Chang Ming	Om Phai	5	2.2	Nai Tavorn Nikarnkon		<u>3.75</u>	Mung Bean, Corn, Pumpkin-		
					Total		<u>6.25</u>	Rice		
					Total Land		<u>19.00</u>			

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
INTEGRATED RURAL DEVELOPMENT PROJECT LMO IRRIGATION PROJECT, SAKON NAKHON
DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION				FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE	MU NO.		MAI (MR.)	MANG (MRS.)			
C.	<u>Test on Soil Reclamation (Fertility Improvement) (Total 3 Sub-Projects sites)</u>									Trial C. Sub- project No. 1-2, done by Technical Division
1.	<u>Test on Effect of Straw Incorporation to Rice Yield (Total 1 site)</u>									
	Pannanikom	Wang Yang	Wang Yang	1	1.1	Nai Khong Konphaeng	2.5	Kaw Khaw 7, Kaw Khaw 9		
2.	<u>Test on Soil Reclaiming Materials and Irrigation Interval for Peanut (Total 2 site)</u>									Sub-project 3 done by Rice Division
	Pannanikom	Wang Yang	Puay	2	2.1	Nai Thong Thiwato	1.6	Hainan 9		
3.	<u>Test on Azolla to Increase Rice Yield in Farmer's Fields (Total 2 site)</u>									Kaw Khaw (irradiated) Kaw Khaw 7 Kaw Khaw (irradiated) Kaw Khaw 7
	Pannanikom	Wang Yang	Wang Yang	1	3.1	Nai Khong Konphaeng	4.0			
					3.2	Nai Virathai Fongorn	1.0			
						Total	5.0			
						Total Land	9.1			
D.	<u>Rice and Economic Crops Seed Multiplication (Total 3 Sub-projects)</u>									Trial D. Sub- project No. 1, done by Rice Division
1.	<u>Rice Seed Multiplication (Total No. of 2 Farmers)</u>									
	Pannanikom	Wang Yang	Wang Yang	1	1.1	Nai Khong Konphaeng	3.0	Kaw Khaw/(irradiated) Kaw Khaw 7, Kaw Khaw 9		
					1.2	Nai Virathai Fongorn	7.0	BR. 1030-28-1-5		
						Total	10.0			

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
INTEGRATED RURAL DEVELOPMENT PROJECT LMO IRRIGATION PROJECT, SAKON NAKHON
DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION			MU NO.	FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE			MAI (MR.)	MANG (MRS.)			
2. <u>Soy Bean Seed Multiplication</u> (Total No. of 1 farmer)										
Pannanikom	Wang Yang	Wang Yang	1	2.1	Nai Cheun Khantiyu		10.0	Saw Chaw 4		Trial D. Sub- Project No. 2-3, done by Field Crops Division
3. <u>Peanut Seed Multiplication</u> (Total No. of 63 farmers)										
Pannanikom	Wang Yang	Wang Yang	1	3.1	Nai Boontorn Khantiyu		8.0	Hainan 9		Peanut Seed Multiplication Hainan 9 one kind of Seed
				3.2	Nai Cheun Khantiyu		8.0			
				3.3	Nai Yuttachai Mataraj		4.0			
				3.4	Nai Porn Mataraj		4.0			
				3.5	Nai Sithon Mataraj		6.0			
				3.6	Nai Srimarn Suwan		4.0			
				3.7	Nai Chai Suwan		8.0			
				3.8	Nai Thaen Soonchan		8.0			
				3.9	Nai Virathai Fongorn		20.0			
					Total		70.0			
Pannanikom	Wang Yang	Puay	2	3.10	Nai Chinda Mapansu		12.0			
				3.11	Nai Thong Thiwato		10.0			
				3.12	Nai Keng Thiwato		6.0			
				3.13	Nai Boondet Thiwato		6.0			
				3.14	Nai Saengthong Thiwato		4.0			
				3.15	Mang som Konphaeng		13.0			
				3.16	Nai Boonthai Bhromsena		4.0			

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
 INTEGRATED RURAL DEVELOPMENT PROJECT LMO IRRIGATION PROJECT, SAKON MAKHOM
 DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION				FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE	MU NO.		MAI (MR.)	MANG (MRS.)			
					3.17	Nai Khaem Fongorn		6.0		
						Total		<u>61.0</u>		
	Phang Khone	Rae	Rae	1	3.18	Nai Vandt Leethong		6.0		
					3.19	Nai Boontawn Phanpinit		6.0		
					3.20	Nai Chern Butrasaen		1.0		
					3.21	Nai Theung Chartchamni		1.0		
					3.22	Nai Somporn Srinanuan		1.0		
					3.23	Nai Suk Srisaket		1.0		
					3.24	Nai Suphrom Buaphit		1.0		
					3.25	Nang Sin Butrasaen		<u>1.0</u>		
						Total		<u>18.0</u>		
			Mong Chote	3	3.26	Nai Khamphu Ornsurthum		12.0		
					3.27	Nai Uthorn Philakul		10.0		
					3.28	Nai Thavin Orn-sutham		4.0		
					3.29	Nai Thongbai Srisoi		4.0		
					3.30	Nai Lee Srisoi		2.0		
					3.31	Nai La Phonthong		2.0		

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
 INTEGRATED RURAL DEVELOPMENT PROJECT LMO IRRIGATION PROJECT, SAKON NAKHON
 DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION			MUSIC NO.	FARMERS NO.	FARMER'S NAME MAI(MR.) NANG(MRS.)	LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOOBAN VILLAGE						
					3.32	Nai Khampao Phonthong	2.0		
					3.33	Nai Phet Munchit	2.0		
					3.34	Nai Karun Phonthong	10.0		
						Total	<u>48.0</u>		
			Um Mao	6	3.35	Nai Thonrak Srisoi	8.0		
					3.36	Nai Boonchan Srisoi	4.0		
					3.37	Nai Thongchan Srisoi	2.0		
Phang Khone	Hai Yawng	Um Mao	6	3.38	Nai Buaphan Srisoi	4.0			
					3.39	Nai So Srisoi	4.0		
					3.40	Nai Sai Orn-surthum	4.0		
					3.41	Nai Salak Sarnphokha	4.0		
					3.42	Nai Ke Srisoi	4.0		
					3.43	Nai Khaek Srisoi	6.0		
					3.44	Nai Ou Srisoi	4.0		
Phang Khone	Hai Yawng	Um Mao	6	3.45	Nai Sarn Srisoi	4.0			
					3.46	Nai Phitphong Srisoi	4.0		
					3.47	Nai Som Srisoi	2.0		
					3.48	Nai Siho Srisoi	2.0		
					3.49	Nai Boontherng Srisoi	2.0		
					3.50	Nai Si Pakkan	6.0		
					3.51	Nang Chit Srisoi	2.0		

ESTIMATES AND DETAILS OF TRIALS OF THE DEPARTMENT OF AGRICULTURE
 INTEGRATED RURAL DEVELOPMENT PROJECT LNO IRRIGATION PROJECT, SAKON NAKHON
 DRY SEASON, B.E. 2523

TRIAL/SUB-PROJECT	LOCATION				FARMERS NO.	FARMER'S NAME		LAND RAI	CROP/CROPPING PATTERNS VARIETY	REMARKS
	AMPHOE	TAMBOL	MOEBAN VILLAGE	MU NO.		NAI (MR.)	NANG (MRS.)			
					3.52	Nai Prayong	Srisoi	2.0		
					3.53	Nai Samrit	Srisoi	2.0		
					3.54	Nai Khan	Srisoi	2.0		
					3.55	Nai Khem	Srisoi	2.0		
						Total		74.0		
	Huang	Phang Khwang Muea	Huey Sai	13	3.56	Nai Laeb	Karun	3.0		
					57	Nai Pheua	Karun	2.0		
					3.58	Nang La	Karun	2.0		
					3.59	Nai Pranorn	Khanthanet	2.0		
	Huang	Phang Khwang Muea	Huey Sai	13	3.61	Nai Phut	Sornsomnuk	4.0		
					3.62	Nai Chiang	Phrata	3.0		
					3.63	Nai Thongphoon	Aksasorn	2.0		
						Total		20.0		
						Total Peanuts Land		291.0		
						Total Land (Crop Multiplication)		311.0		

E. Sericulture

The operation is carried out at Nakhon Nam Oon Sub-district. Because of the dry season responsible officials are sent out to supervise pruning and trimming of mulberry trees belong to 18 farmers in order to have ready for worms feed during the wet season B.E. 2523 (1980).

Note: Total of Trials: 5 Trials - 21 Sub-projects; Land 377.91 rai, and number of farmers 100.

LIST OF FIELD WORKERS
 INTEGRATED RURAL DEVELOPMENT PROJECT
LAM NUN OON IRRIGATION PROJECT

<u>Division</u>	<u>Name - Surname</u>	<u>Position</u>	<u>Location (Stationed at)</u>
1. Field Crops Division	1. Mai Pramern Ves-urai	Agricultural Administrative Personnel, Grade 6 SN Field Crops Experiment Station Chief Asst. Field Project Director (Field Crops)	Sakon Nakhon Field Crops Experiment Station, Changwat Sakon Nakhon
	2. Mai Vilat Rukeor-	Agriculture Officer, Grade 4	SN Field Crops Experiment Station, SN
	3. Mai Boonma Sukphan	Agriculture Worker Grade 2	SN Field Crops Experiment Station, SN
2. Technical Division	1. Mai Chalarakiat Saisoong	Agriculture Technician, Grade 6 Asst. Field Project Director (Rice)	Khon Kaen Rice Experiment Station
	2. Mai Natvut Kasayawan	Agriculture Technician, Grade 5	Agricultural Economic, Management Section Technical Div., Dept. of Agriculture, Kasetsart University, Bangkok, Bangkok 9.
	3. Mai Banlu Bhrosri	Agr. Civil Officer, Grade 3	Agr. Management Section SN Field Crops Experiment Station
3. Rice Division	1. Mai Nivat Chardensin	Agr. Civil Officer, Grade 3	SN Rice Experiment Station, Sakon Nakhon
	2. Mai Chaisak Phaeopholsong	Agr. Civil Officer, Grade 2	SN Rice Experiment Station, Sakon Nakhon
4. Horticulture Division	1. Mai Surasak Indrakamhaeng	Agr. Technician, Grade 5	Vegetables Section
	2. Mai Phnom Boon-in	Agr. Civil Officer, Grade 3	Nakon Phanom Horticulture Experiment Station, Nakon Phanom
5. Sericulture Division	1. Mai Pravej Saenamwong	Agr. Technician, Grade 4	Sericulture Experiment Station, Sakon Nakhon
	2. Mai Banchob Thepjang	Agr. Civil Officer, Grade 3	Sericulture Experiment Station, Sakon Nakhon

Annex D

DRAFT (March 14, 1980)
Department of Agricultural Extension
(Budget for 8-Months, 1980)

1. Target Area:

There are six Tambols in the Lam Nam Oon project area which should be the objects of greatest attention by all participating agencies during the 1980, 1981, and 1982 period. This is because they contain all of the various Pilot Areas and special irrigation system inputs that will be installed, eventually, throughout the entire project area.

They comprise:

Pilot Area 1		
Pilot Area 2 (to be Selected and developed)		
Pilot Area 3		
Tambol Chang Ming	- Traditional ditch/dike	- 12 villages
Tambol Phanna	- Traditional ditch/dike	- 11 villages
Tambol Hi Yong	- Traditional ditch/dike	- 9 villages
Tambol Rai	- Land consolidation/ levelling	- 5 villages
Tambol Wang Yang	- Land consolidation/ levelling	- 6 villages
Tambol Pok Noi	- Redesignated and managed ditch/dike systems	- <u>7</u> villages
		50 villages

This target area should be regarded as an area of training for the entire project, which comprises 13 Tambols.

2. Starting in 1980 the Department of Agricultural Extension will concentrate its Kasset Tambols on the following general assignments in the target area:

- a) Under the technical training guidance of Dr. George Hill, Kamin Saisaengchan, Chainarong Butrobol, Erroll Coles, William Bell and other technical specialist on the Louis Berger International, Inc. team learn the use of soil suitability maps in advising farmers on what crops to plant.
- b) Similarly, at the Lam Nam Oon Administration Center, participate in a May, 1980 review session with the Department of Agriculture concerning applied research

results in rice and upland crops for the 1978-79 wet and dry seasons in the Lam Nam Oon area. Also discuss initial results drawn from 1979-80 dry season research.

- c) With the advice of the Louis Berger Team, select demonstration farmers (5 Rai each) for the 1980-81 dry season with emphasis upon water use (measured); soils classification; soils ammendment, cultivation practices; and crops, - in the following areas:

Pilot Area 1	-	1	Farmers
Pilot Area 2	-	3	"
Pilot Area 3	-	2	"
Tambol Chan Ming	-	2	"
Tambol Phauna	-	2	"
Tambol Hii Yong	-	2	"
Tambol Rai	-	2	"
Tambol Wang Yang	-	2	"
Tambol Pok Noi	-	<u>2</u>	"

18 Farmers @ Rai 5 each
90 Rai total

Budget inputs in seeds, fertilizer, pesticides, and liming according to technically correct specification and then supply to demonstration farmers on a timely basis.

- d) With the advice of the Louis Berger team, learn:
- How to take soil samples from farmer demonstration fields.
 - How to package and send samples to Tha Phra for test.
 - How to interpret test results into specific fertilizer and liming programs for each demonstration farm.
- e) With the advice of the Louis Berger team, learn:
- How to instruct demonstration farmers about the amounts and timings of water applications on specific crops.
 - How to instruct demonstration farmers in measuring water use.
 - How to inform each farmer about the importance of drainage, and ways by which each farmer can keep drainage efficient.

- f) With the advice of the Louis Berger team, learn:
- Appropriate pesticide and insecticide applications for different crops
 - How to promptly obtain expert DOA assistance in diagnosing unusual pest or plant disease conditions.
- g) With the help of the Louis Berger team, learn how to observe the socio-economic conditions of farmers and to use socio-economic analytical results in judging how to select demonstration farmers and setting up their demonstration programs.
- h) Work with R.I.D. and C.D. in informing farmers about the technical importance of land consolidation and how to farm properly in land consolidated areas.
- i) Support the development of demonstration fish ponds and tests that will help determine the usefulness of the aquatic plant, Azolla Pinata.

3. With advice from the Louis Berger team, and in accordance with operational principles of the Training and Visit system, establish a recording chronology and operate it, step by step, from seed bed preparation to harvest, crop by crop, in every tambol in the target area.

4. Present analysis by the Louis Berger TEam shows that the following minimum quantities of fertilizer, insecticides, pesticides, and lime will be required for the dry season of 1980-81 on the proposed 90 rai of demonstration farms:

Fertilizer: 16:20:00	2,200	Kg.
15:15:15	2,000	Kg.
Insecticide/pest		
furaduan	600	Kg.
lanata	10	Lit
twin diathoate	18	Lit
mathion	48	Lit
Lime	<u>6,000</u>	Kg

5. Initiation of construction of Kasset Tambol residential housing in each Tambol Headquarters village for the 6 Target Tambols.

DEPARTMENT OF AGRICULTURAL EXTENSION
FINANCIAL PLAN
(BAHT)

CLASS AND ITEM

FY 1980

	2nd QTR		3rd QTR		4th QTR		AID	RTG	TOTAL
							TOTAL	TOTAL	
	AJD	RTG	AID	RTG	AID	RTG			
1. <u>LAND AND CONSTRUCTION</u>									
Erection of 6 Tambol. Kaset Residence in Tambol Headquarters villages @ Baht 175,000 each			525,000		525,000		1,050,000		1,050,000
							1,050,000		1,050,000
2. <u>EXPENDABLE SUPPLIES</u>									
- Fertilizers for 1980/81 Dry Season					47,000		47,000		47,000
- Insecticides, Pesticides for 1980/81 Dry Season						26,000		26,000	26,000
- Liming with fertilizer for 1980/81 Dry Season					36,000		36,000		36,000
- Fertilizers, insecticides, pesticides for 1979/1980 Dry Season and Wet Season		30,000		30,000				60,000	60,000
- Office Supplies	4,000						4,000		4,000
- Gasoline, oil, lubrication (transport of supplies and K.T. motorcycle fuel)	10,000	10,000	10,000	10,000	10,000	10,000	30,000	30,000	60,000
							117,000	116,000	233,000
3. <u>EQUIPMENT</u>									
- Pickup Truck, 1,600 cc		120,000						120,000	120,000
- Motorcycles, 7 (฿. 20,000)		140,000						140,000	140,000
- Office Desk with Chair for C-1 & C-2, 6 (฿ 1,200)		7,200						7,200	7,200
- Filing Cabinet, 4 drawers, 2 each (฿ 800)		1,600						1,600	1,600
- Overhead Projector ELMO HP-2450 - 1	11,400						11,400		11,400
- Portable Generator, 2 Kw	7,000						7,000		7,000
- Slide Projector PAKINAT 2950	11,900						11,900		11,900
- Copying Machine CANON MP 600	84,000						84,000		84,000
- Duplication Machine, ROWE	30,000						30,000		30,000
- Pocket Calculator, CASIO, 13 @ ฿ 400	5,200						5,200		5,200
- Scale, 50 kg. cap., LION Brand, @ ฿ 380 each - 4	1,520						1,520		1,520
- Sprayer, hand-operated, 92 @ ฿ 450	41,400						41,400		41,400

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	2nd QTR		3rd QTR		4th QTR		AID	RTG	TOTAL
	AID	RTG	AID	RTG	AID	RTG	TOTAL	TOTAL	TOTAL
- Sprayer, engine-operated, 25 3/4 @ 1,000 each							45,000		45,000
- Water pumps, 3 in., BRIGGS & STRATTON with 15 ft. pipe, 12 @ \$ 5,000 each	6,000						60,000		60,000
<u>PERSONNEL</u>									
- Technical resource person for training Bent 50/hr., 50 hours						2,500		2,500	2,500
<u>WAGES</u>									
- Civil service salary, 28 position							289,100		289,100
- Permanent employees, 5 positions							26,250		26,250
- Temporary employees, 5 positions							9,150		9,150
<u>TRAVEL, LODGING, PER DIEM, AND OTHER EXPENSES</u>									
- Travel, lodging, Per Diem							196,450		196,450
- Gasoline, oil, and lubrication (official inspection/supervision)							30,700		30,700
- Demonstration Plot signs							8,100		8,100
- Expenditures of 2 farm demonstration days, @ 3,000/day					6,000		6,000		6,000
- Rental of bus on farm demonstration days and other training @ \$ 8,000 (2 times)	8,000		8,000		8,000		16,000		16,000
- Soil preparation for training						4,000		4,000	4,000
- Contact Farmer training costs (50 persons)					30,000		30,000		30,000
							52,000		52,000
							239,250		239,250
							1,513,132		1,513,132
							2,551,750		2,551,750
							2,466,482		2,466,482

April 21, 1980

Rongruang Chulajata
Field Project Director
Lam Nam Oon Integrated Rural Development
Project
Amphoe Phang Khone
SAKON NAKHON

Subjects: Work Schedule for Design, etc. 10,000 Rai Area - Land Consolidation

Ref: Memo Daltpn-Chulajata of April 16, 1980 'Getting Ready for Private Contracting - Specifications and Standards'.

From: James J. Dalton, Team Leader, Louis Berger International, Inc.

Messers. Bell, Coles, and myself have intensively reviewed the work that is needed between this date, APRIL 21, and JULY 1 in order to complete all documentation concerning 10,000 Rai of Land Consolidation area in Tambols Rai and Wang Yang.

As you will note from the attached Flow Chart we estimate that it will require 11 men 64 days to complete all of the work outlined in the Steps detailed below, ANNEX A, and ANNEX B.

These estimates are for a total of 10,000 Rai and about 6,000 Rai of this total will be given to private contractors. Thus, all essential documentation for the 6,000 Rai portion must be completed by July 1, 1980 - so that the normal bidding process can begin.

The two critical processes (most time consuming) in the Steps outlined below are Preliminary Design and Readjustment of farm boundaries. (ANNEX A)

The Readjustment work will also require help from CD, RID, and others in negotiating the necessary changes with the individual farmers. Thus, if the existing 11-person team is expected to do ALL of the readjustment work with farmers - without help - then it is more than probable that the 64-day schedule will not be met. Your help in obtaining additional assistance to work on farm boundary adjustments will be most important to insuring successful compliance with the 64-day schedule.

Similarly, the team will need some help from the Office of Engineer in determining unit costs. Your help in seeing that this special help is provided to the 11-man team will be vital.

Bell and Coles will act as the technical advisory back-up to the 11-man team. It would be helpful, if you accept the attached schedule, to set up weekly meetings with the 11-man team and Bell/Coles to be certain that any delays encountered are quickly overcome. Otherwise, this tight schedule can easily slip out of control.

Attaches Annex A - TASKS and STEPS for completion.
Annex B - Flow Chart
Annex C - Bar Chart

CC: Piphat Sathapitarnit - RID
Suthin Tancharoen, Team Leader - RID
Sansonthi, Assistant Field Project Director
Mr. Frank Gillespie - AID
Mr. Peter Gajewski - East Orange

ANNEX A

TASKS and STEPS for Completion

TASK I **Develop Work Sheets**

Step A:

1. Use cadastral map.
2. Overlay with plain transparency sheet which will be basis of Work Sheet.
3. Trace boundaries for drainage.
4. Trace roads.
5. Trace primary and secondary canals.

Step B:

1. Use topographic map.
2. Overlay with transparency Work Sheet taken from Step A.
3. Locate and trace 1 meter contours.
4. Locate and trace secondary drains.
5. Locate structures, drops, turn-outs, water surface elevations.

Step C:

1. Use aerial photos.
2. Overlay with transparency Work Sheet taken from Syep B.
3. Locate and trace Categories, A, B, and C concerning cover, terrain, etc.

TASK II **Prepare Preliminary Layout for Canals and Drains**

1. Use developed Work Sheets above as a base.
2. Apply following criteria:
 - a. Category A, B, and C
 - b. Exclude certain classes of soils.
 - c. Follow Topographic features.
 - d. Locate critical field heights for canals.
 - e. Locate areas too high to be served by canals.
 - f. Rationalize drainage of area.
 - g. Fix tertiary canal distances to drain between 180 and 200 meters.
 - h. Assume road for each tertiary canal.

TASK III **Check all systems and work done to date.**

TASK IV **Survey Team Operations:**

- Assignment 1: Check center line profiles for proposed canals, and report to designers.
- Assignment 2: Survey selected Pilot Area 2.

TASK V Preliminary Design:**Step A: Design Data Applied:**

- | | |
|------------------------------------|---|
| a. Water requirements: | .29 Liters/sec./Rai. |
| b. Drainage Discharge Coefficient: | .4 Liters/sec/Rai. |
| c. Road Height: | Not to exceed .5 Meters above field level. |
| d. Road Widths | Not to exceed 3 Meters |
| e. Road Sideslope | 1:1 |
| f. Structures | Use R.I.D. Standards |
| g. Canal and Drain Design: | Use Critical Tractive Force (CTF) Method for canals and drainage. |

Step B: Develop Design Drawing:

- a. Calculate Chak areas to be served by each canal and drain.
- b. Plot longitudinal sections and Plan sections for each canal and drain.
- c. Plot cross-sections for canals and drains.
- d. Calculate Q-values, flow data, etc.
- e. Locate structures.

TASK VI Check all calculations and layouts.

TASK VII Final Layout Drawing:

1. Readjust farm boundaries and plot.
2. Measure farm area. (Use of planimeter)
3. Obtain farmer permission for boundary readjustments.
4. Readjust layout, if required.
5. Readjust design, if required.

TASK VIII Finalize all drawings and final check.

TASK IX Production and Printing of Drawings.

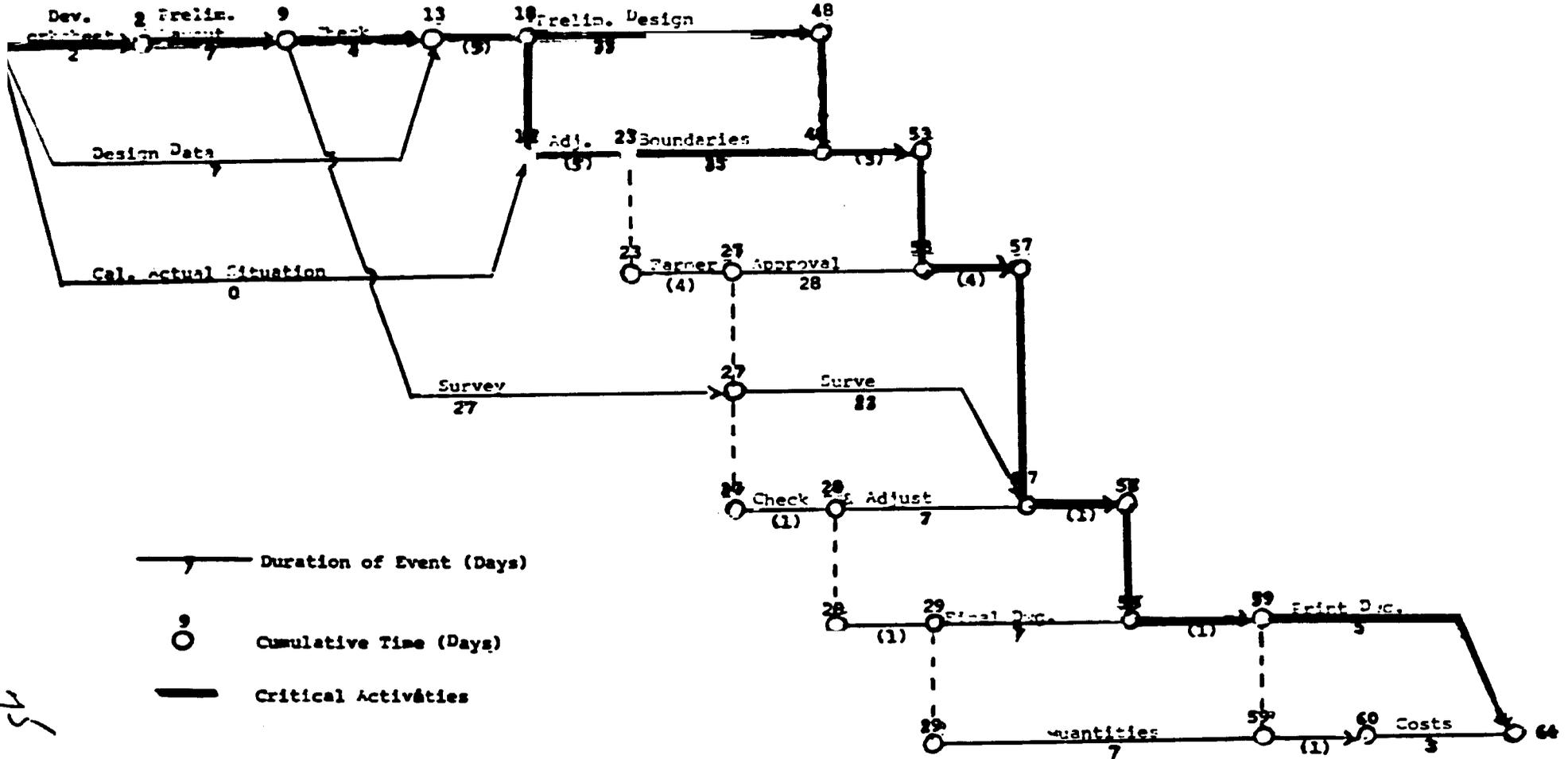
TASK X Work up Estimates on Quantities and Draw up a Schedule of Quantities.

TASK XI Engineer Estimate of Costs.

TASK XII Write Specifications and Tender Documents for 6,000 Rai Construction by Private Contractors.

Ann. E. 3.
FLOW CHART

Land Consolidation Design Team Activities



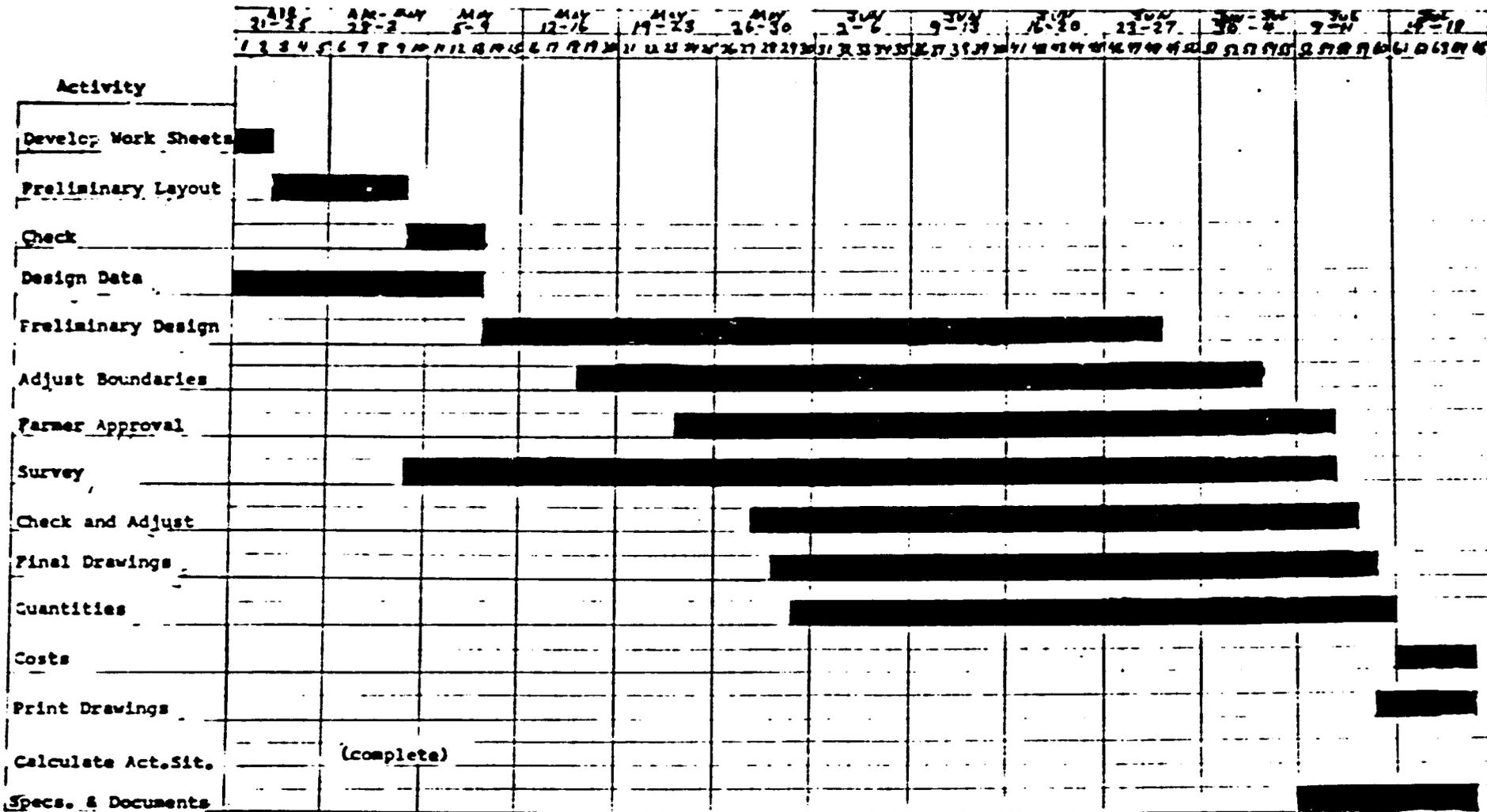
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Best Available Document

ANNEX C

Land Consolidation Design Team Activities

BAR CHART



6/1

CHAPTER III

STATUS OF PROJECT-RELATED ORGANIZATION AND OPERATION

3.1 Mobilization of the Louis Berger International, Inc. Advisory Team major long-term and short-term personnel was completed during this quarter. The status at the end of the quarter appears on the attached Chart A. The time constraints affecting a number of the team skills indicates that it's highest capacity for achievement as a unified team on the site will have been this quarter. After that it's delivery capacity will be fragmented by skill and time sequences into smaller components.

3.2 Support staff employment arrangements continued to alter during the quarter, particularly at Bangkok. This was due, principally, to the realization that with the Team Leader working at Lam Nam Oon more than 50% of each month, it would be wasteful to employ some kinds of full-time staff at Bangkok.

Therefore, part-time secretarial help only was employed at Bangkok together with a full-time accountant and an administrative assistant/driver.

3.3 Funds began to flow during this quarter, albeit slowly. The Initial Mobilization payment was made to the Contractor. Invoice processing began to speed up although the backlog will take some time to work off.

The unstinting financial assistance constantly provided by the Louis Berger International, Inc. Headquarters office actually kept the team operational. Until such time as the Invoice backlog is cleared off, this support will continue to be indispensable. Present indications are that by mid or late July the Invoice situation will be normal.

3.4 The Project Field Director provided great assistance, during the quarter, in speeding the field review and processing of all Invoices. Under the current system every detail of each Invoice must first be reviewed and approved by the Project Field Director prior to final submission for review and approval by R.I.D.-Bangkok. This necessitates much travel back and forth from Bangkok to Lam Nam Oon by the Louis Berger Team Leader since hi-speed English language typing and reproduction facilities for Invoices are only located in Bangkok.

Aware of this, the Project Field Director has done everything he can to minimize the time constraints while meeting the demands of the Invoice review process. One of the most helpful steps has been the full-time assignment of Khun Naowarat Meksakul as liaison officer at R.I.D. - Bangkok for the project. Her duties include frequent travel to Lam Nam Oon and assistance, there, to the Field Project Director in reviewing and approval of Invoice detail.

3.5 Another very helpful development in the Invoice review and approval process has been the improved systematization of documentation requirements introduced by Khun Pornsak of the R.I.D. Finance Division. His very conscientious hard work and wise advice has been increasingly helpful in introducing steady routines to the invoicing procedures.

3.6 Team communications and transportation continued to be troubled. Lack of technically qualified interpreters translators at Lam Nam Oon impeded specialist engineer and agriculturist efforts to work directly with farmers and junior level Thai technical staffs. This looks to be a continuing situation - for which there will be no improvement.

R.I.D.'s good support in providing vehicles for transport continued during the period; but a serious accident to one vehicle - on March 27, has now reduced the fleet available to the team. The Bangkok-assigned Land Rover was transferred to Lam Nam Oon on April 13. Transportation in Bangkok will now be by bus and taxi. Bids are being obtained for repair of the wrecked vehicle; and it is hoped that by August the four-car fleet can be restored to it's full strength.

3.7 Team contact and cooperation with a growing number of Thai technical and policy-making personnel continued to expand rapidly during the quarter. This included:

- a) The assignment of a design staff to Lam Nam Oon to work with the engineers of the Louis Berger Team in designing the next 10,000 rai on-farm water supply development.
- b) The assignment of a survey team to Lam Nam Oon to also assist the design efforts.
- c) Contact with Dr. Warin Wonghangchao, Director of the Social Research Council in order to do a socio-economic survey of three locations at Lam Nam Oon.
- e) Contact with Dr. Malee Sundhagul of the Asian Centre for Population and Community Development concerning tests of a solar-powered pump in the Lam Nam Oon Area.
- f) Investigation of project development possibilities for the area with:
 - The National Council of Women - Thailand
 - The National 4-H clubs
 - The Overseas Education fund
 - CLUSA

3.8 The decentralized, flexible, nature of this project continues to be a matter for comment. Each department at Bangkok is, obviously, trying to provide maximum support to the project. Team Leaders are aware that they are getting that support; and this lends strength to all efforts aimed at improved local planning and implementation.

It is to be hoped that, in the coming months, this asset (favoring improved local planning) can be used as a means of strengthening integration within the project.

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ANNEX A
MAN-MONTH SCHEDULE OF BERGER TEAM
(PY 1979-1980)

POSITION:	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	<u>COMPLETED</u>		<u>REMAINING</u>		<u>TOTAL</u>
													MM	%	MM	%	MM
<u>Expatriate</u>																	
Team Leader		—————	—————	—————	—————	—————	—————	—————	-----	-----	-----	-----	5	13	31	87	36
Vtr. Mgmt. O&M Eng.			—————	—————	—————	—————	—————	—————	-----	-----	-----	-----	4	33.3	7	66.6	12
Systems/On-farm Irr. Eng.		—————	—————	—————	—————	—————	—————	—————	-----	-----	-----	-----	6	15	34	85	40
Ag. Extension			———	—————	—————	—————	—————	—————	-----	-----	-----	-----	4.5	75	1.5	25	6
Rural Develop.													0	0	6	100	6
Hydrology													0	0	1	100	1
Ag. Economist													0	0	3	100	3
Irr. Ag. Develop. Spec.													0	0	2	100	2
<u>Thai</u>																	
Ag. Extension/Agronomy			—————	—————	—————	—————	—————	—————	-----	-----	-----	-----	5	33.3	10	66	15
Rural Develop.			—————	—————	—————	—————	—————	—————	-----	-----	-----	-----	5	83.0	1	17	6
Soil Scientist													0	0	2	100	2
Farm Instit. Spec.													0	0	2	100	2
Irr. Ag. Develop. Spec.													0	0	2	100	2
Fisheries Specialist													0	0	2	100	2

————— COMPLETED
----- SCHEDULED

TOTALS

Expatriate Staff
Thai Staff

110 Man-Months
29 Man-Months
139