

6-11. Equipment Planning

The equipments required for the APC are as shown in the attached Table 6-11-1. It is necessary to pay particular attention to the following points.

- 1) To select equipment of suitable contents and levels matched with contents of activities of researches, experiments, extension and training.
- 2) To make selection with equipment which requires less running cost and which permit easy maintenance control.
- 3) To select equipment which permits easy maintenance including periodic inspection and supply of spare parts for selection of equipment of high degree in particular with importance attached to after care, and to make consideration of maintenance equipment for repair.
- 4) To fully take into account APC's operation staff and activity programs for decision of quantity of equipment. It is also important to cause effective operation with joint use of equipment taken into account.
- 5) To select equipment, which requires water supply, of specification that is strong against damage by salt, with the fact that salt content of the potable water is high taken into account.

Suitable operating techniques and maintenance technology are required for possessing equipment as aimed at the beginning. For this purpose it becomes necessary to maintain a close tie with project type technical cooperation from Japan, and to make security of the structure to accept engineers of the Philippines, planned guidance of operating techniques and suitable supply of spare parts.

6-12. Experimental Farm Planning

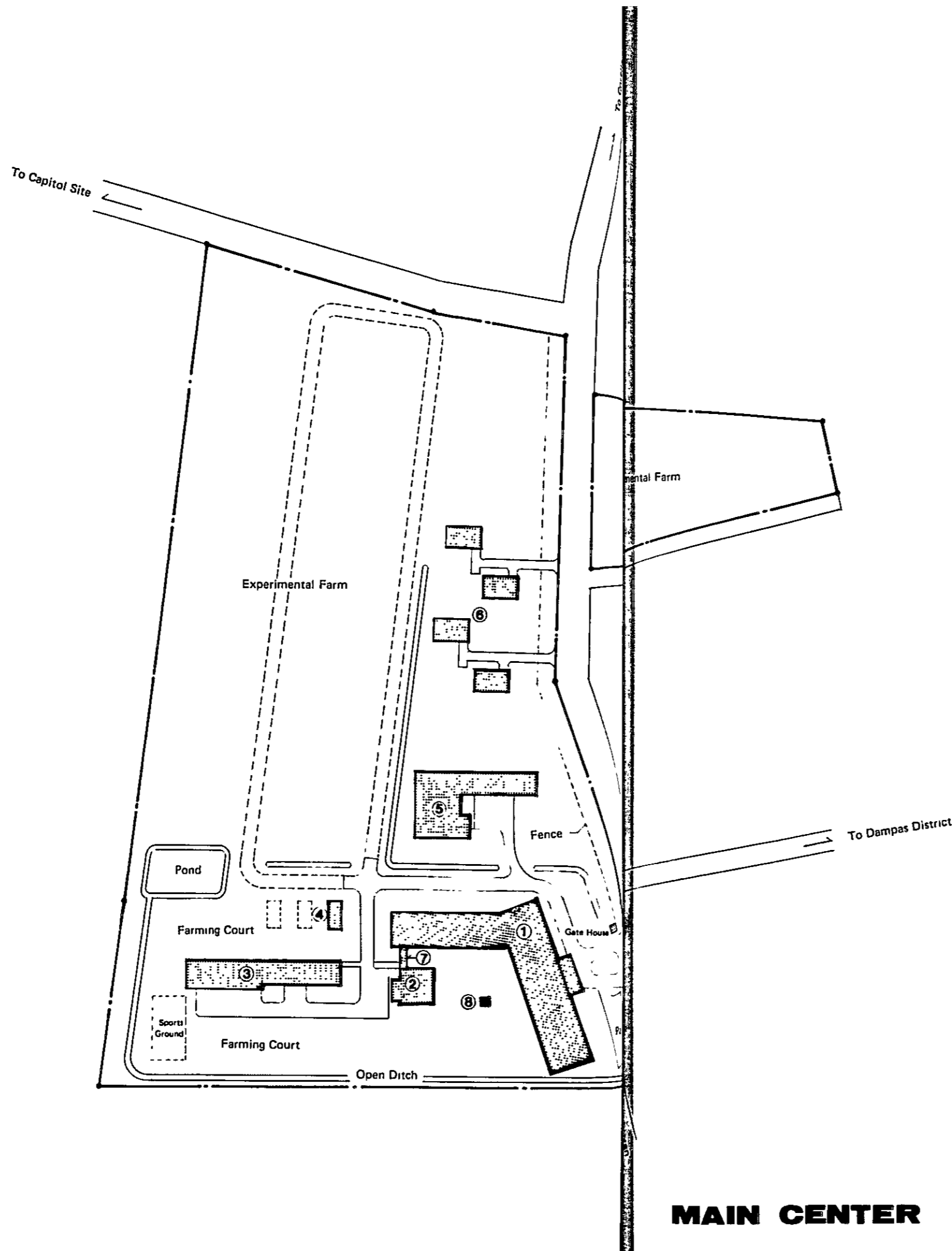
In the APC project, it is planned that fields mainly for dry field farming and fruit trees will be consolidated at the main center and fields for irrigated rice will be consolidated at the rice research sub center, to be used for technological researches, extension activities and training and information services.

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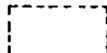


Drawings of Basic Design

List of Drawings

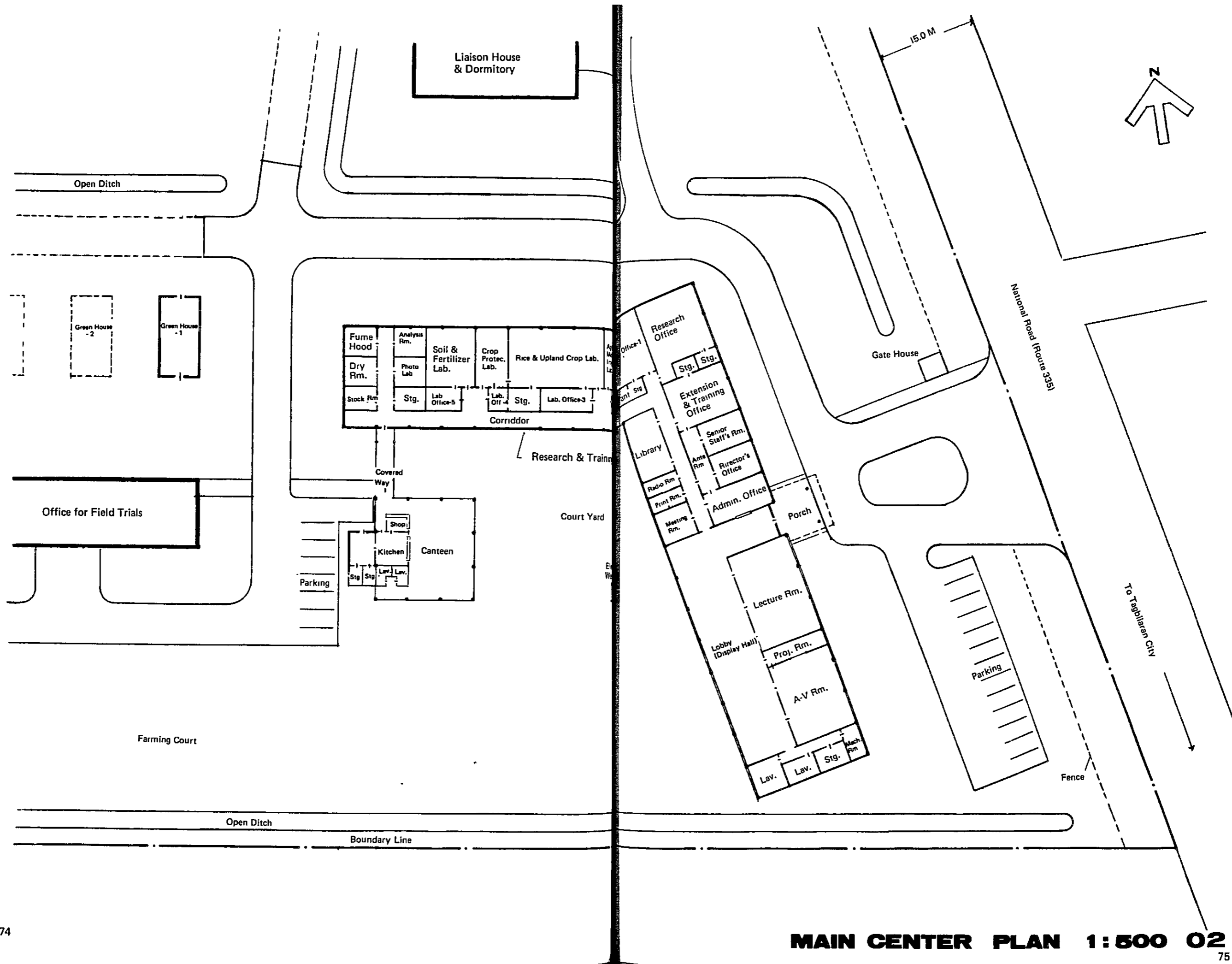
01. Main Center Plot Plan
02. " Plan (Research & Training Bldg.)
(Canteen)
03. " Plan (Office for Field Trials)
04. " Elevation & Section
(Research & Training Bldg., Canteen,
Office for Field Trials)
05. " Plan (Dormitory & Liaison Office)
06. " Water Supply & Drainage System
07. " Electrical & Telephone System
08. Rice Research Sub Center Plan
09. Livestock Research Sub Center Plan
10. Elevation & Section (Sub Centers, Expert's House,
Liaison Office and Dormitory)

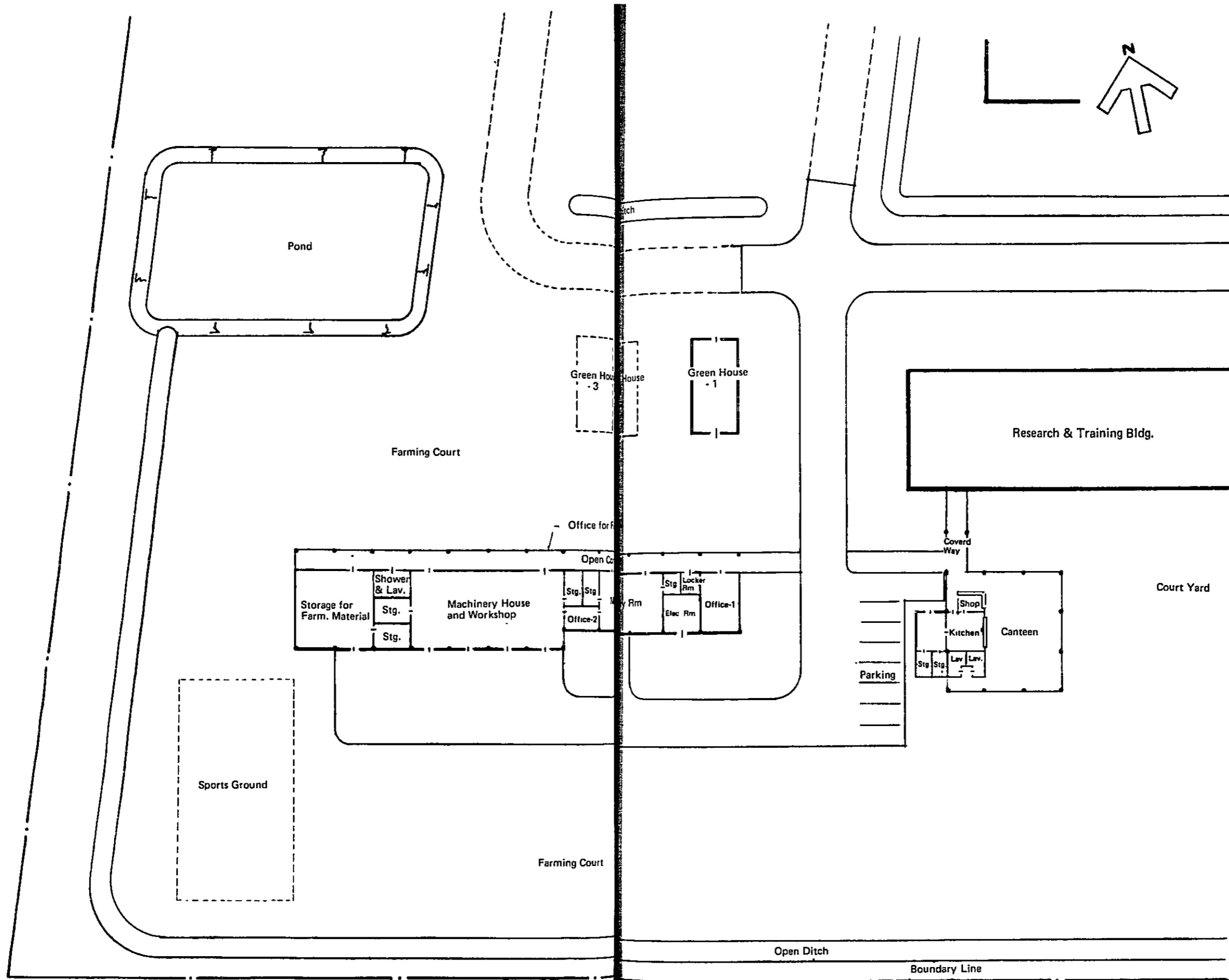


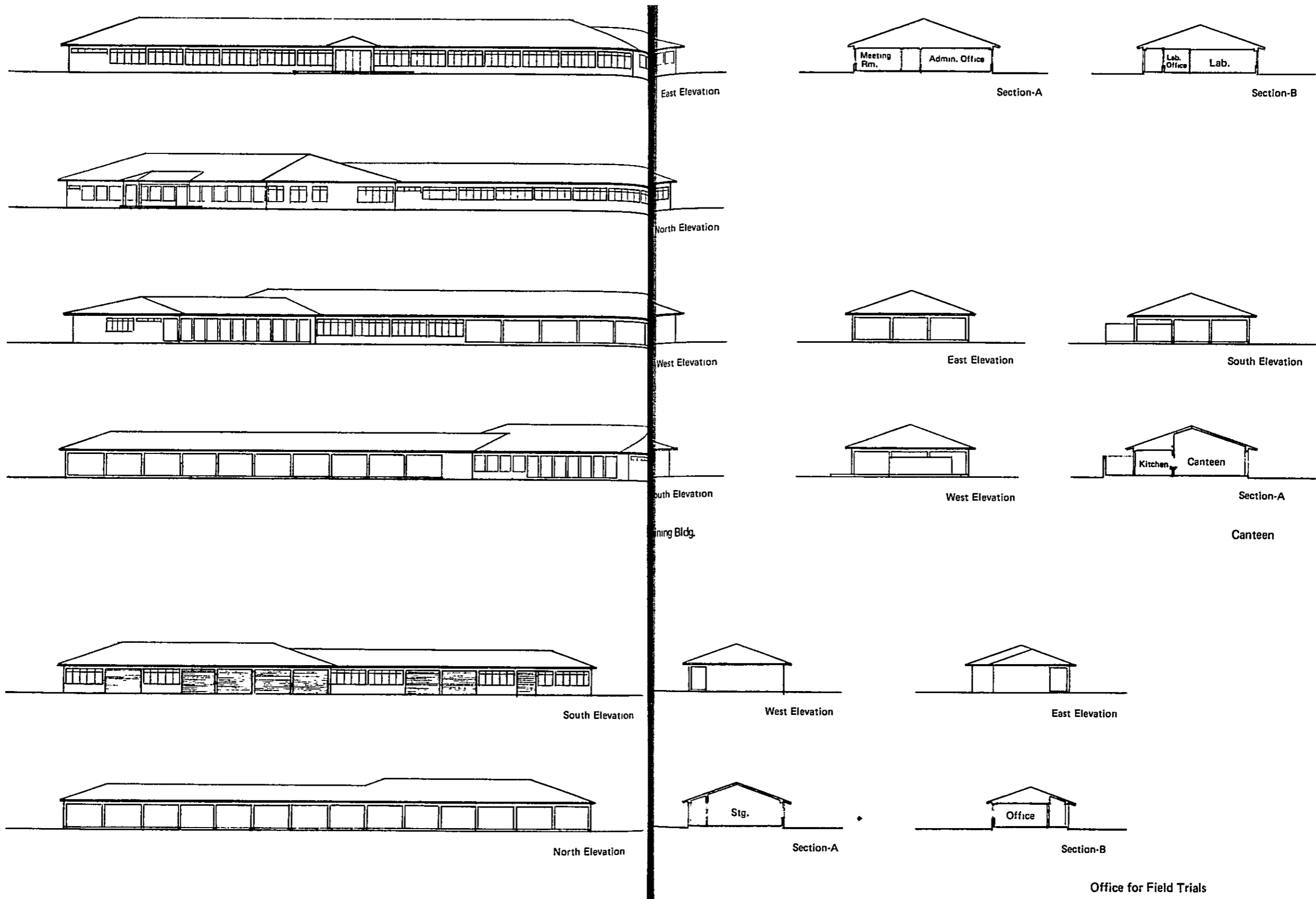
LEGENDS

-  : FUTURE WORKS
-  : MAIN CENTER BLDG.
-  BOUNDARY LINE
- ① RESEARCH & TRAINING BLDG.
- ② CANTEEN
- ③ OFFICE FOR FIELD TRIALS
- ④ GREENHOUSE
- ⑤ LIAISON OFFICE & DORMITORY
- ⑥ EXPERTS' HOUSE
- ⑦ COVERED WAY
- ⑧ ELEVATED TANK

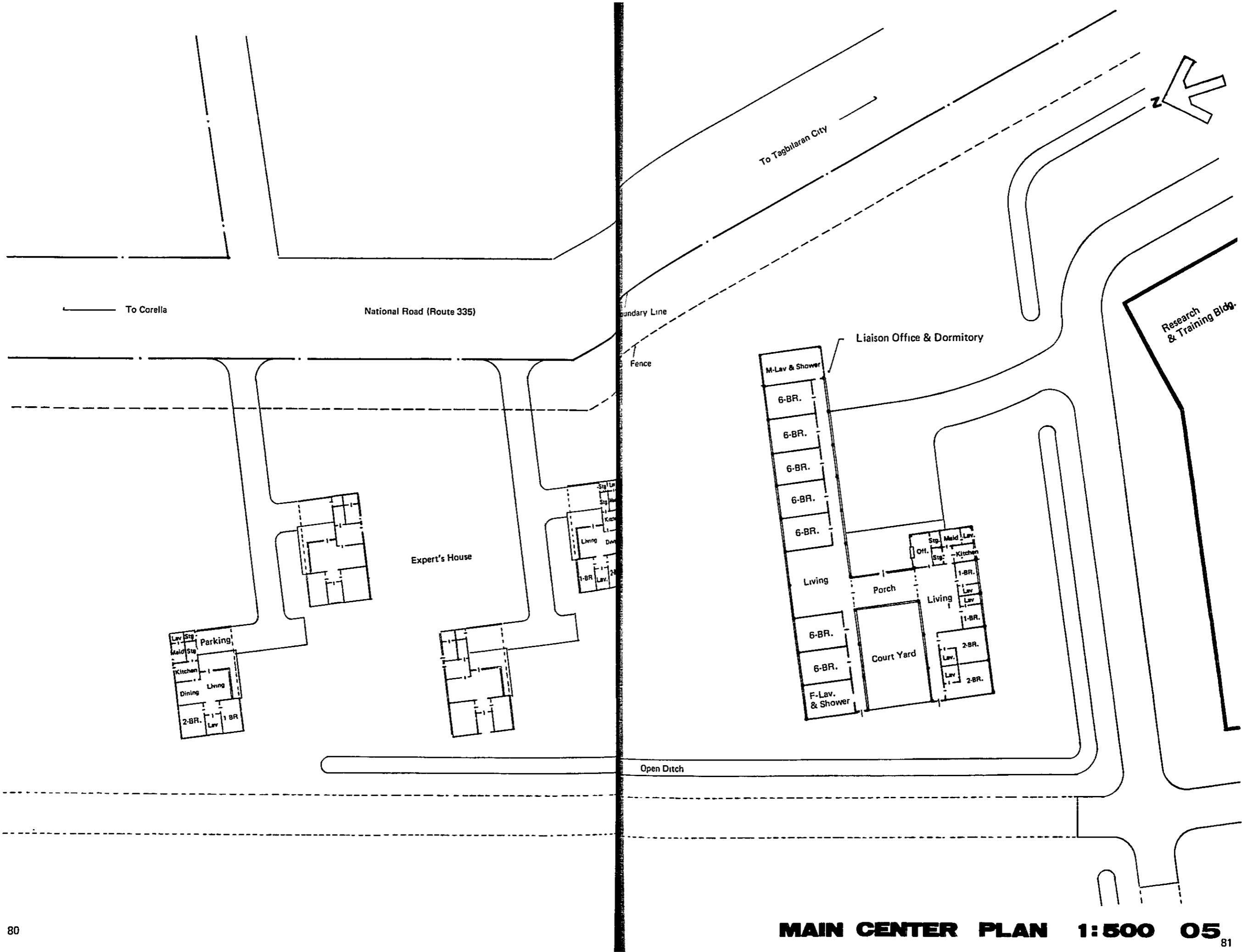
MAIN CENTER PLOT PLAN 1:2,000 01

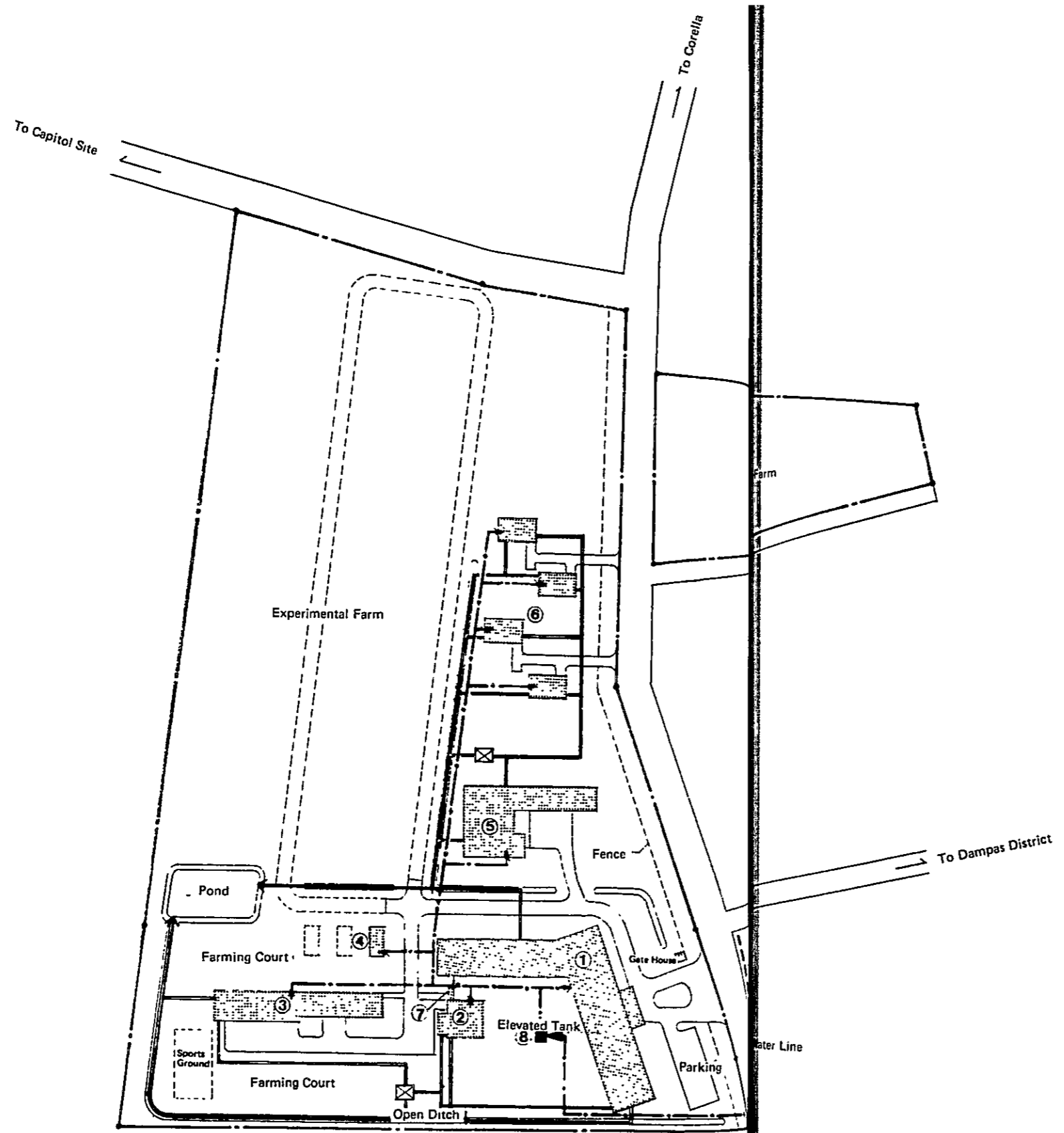






MANAGER ELEVATION & SECTION 1:500 04

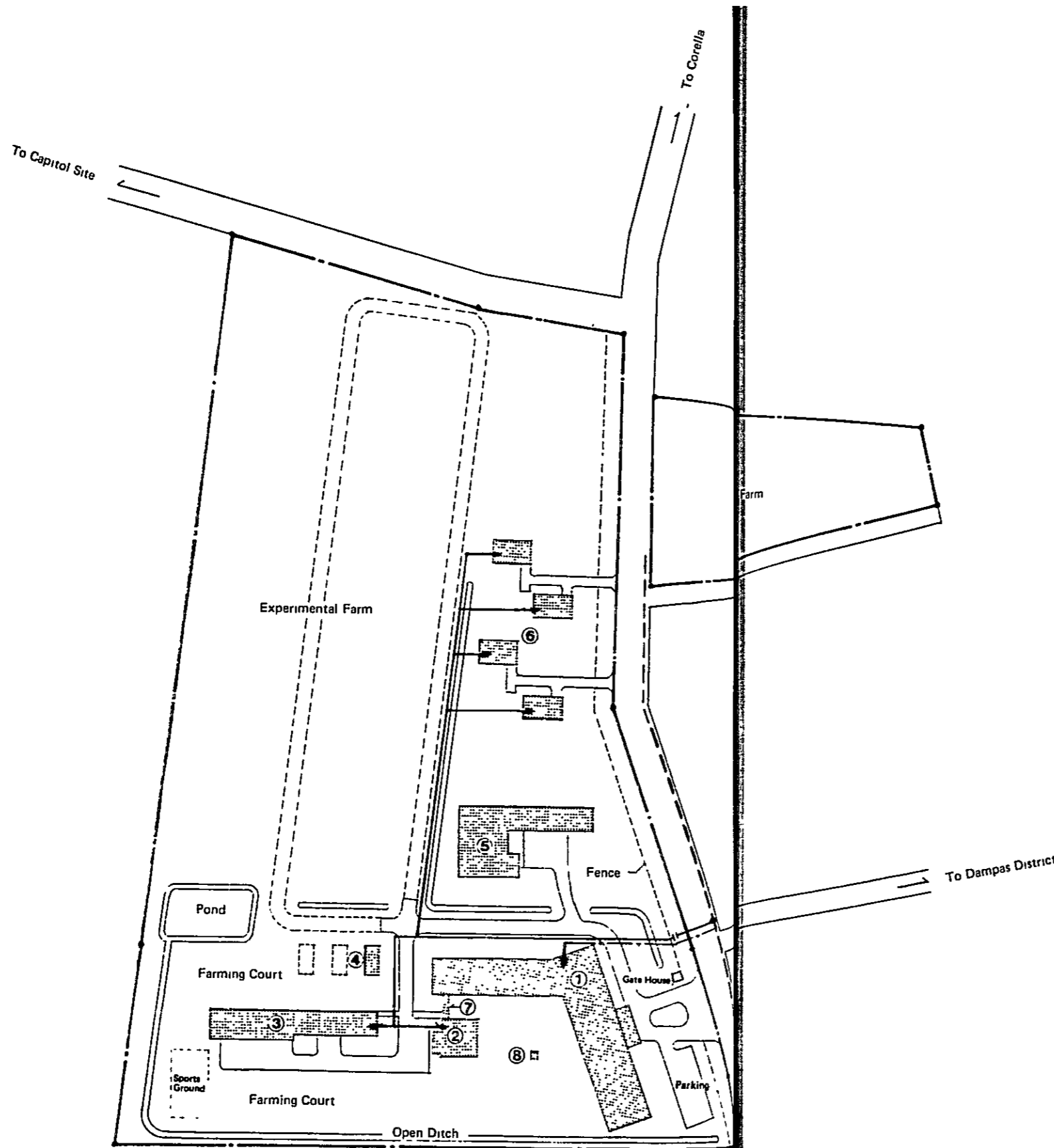








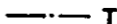
LEGENDS

-  : FUTURE WORKS
-  : MAIN CENTER BLDG.
-  BOUNDARY LINE
- ① RESEARCH & TRAINING BLDG.
- ② CANTEEN
- ③ OFFICE FOR FIELD TRIALS
- ④ GREENHOUSE
- ⑤ LIAISON OFFICE & DORMITORY
- ⑥ EXPERTS' HOUSE
- ⑦ COVERED WAY
- ⑧ ELEVATED TANK
-  SEPTIC TANK
-  WATER SUPPLY LINE
-  DRAINAGE LINE

**MAIN CENTER
WATER SUPPLY & DRAINAGE SYSTEM 06**



LEGENDS

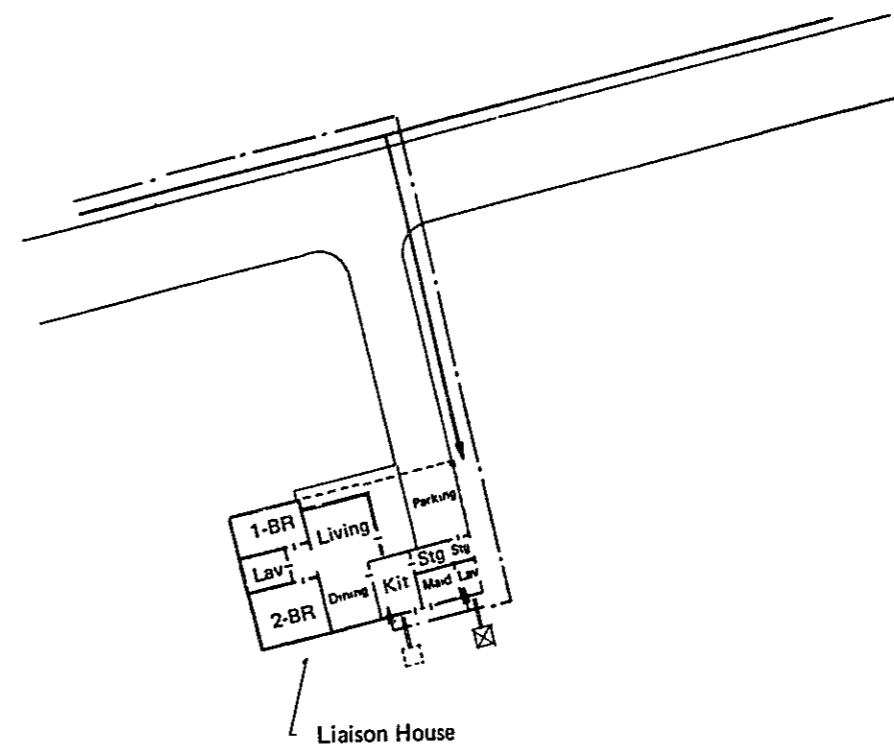
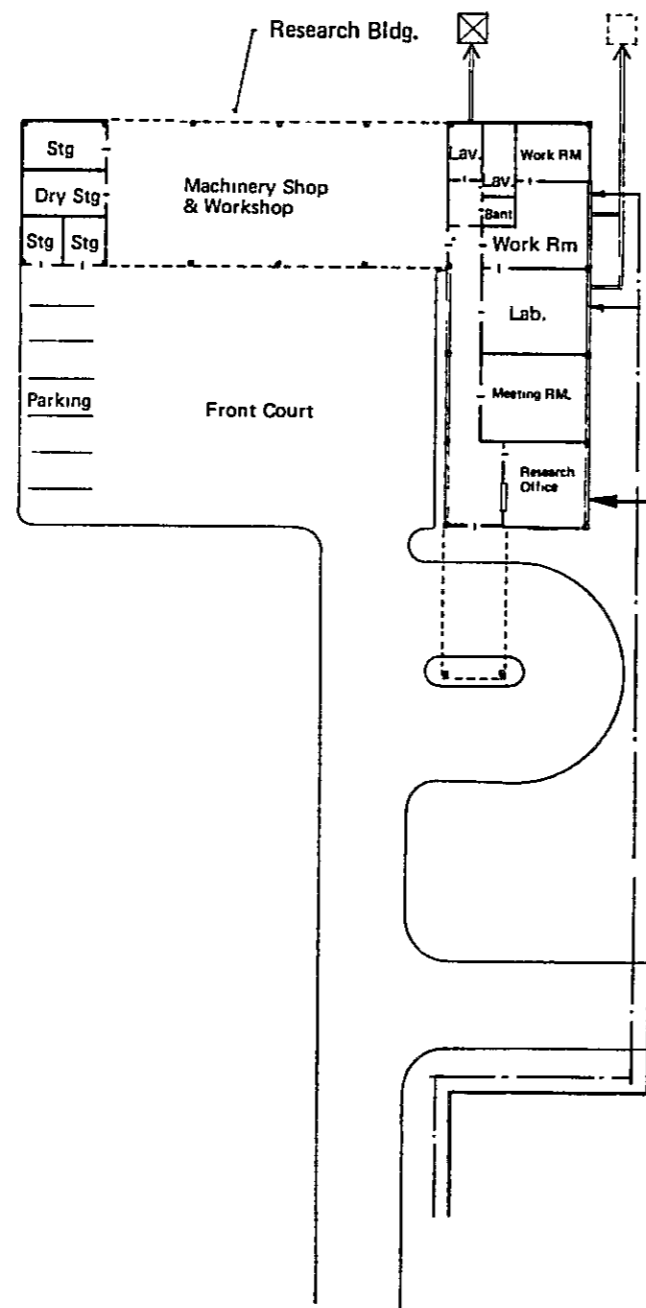
-  : FUTURE WORKS
-  : MAIN CENTER BLDG .
-  BOUNDARY LINE
- ① RESEARCH & TRAINING BLDG .
- ② CANTEEN
- ③ OFFICE FOR FIELD TRIALS
- ④ GREENHOUSE
- ⑤ LIAISON OFFICE & DORMITORY
- ⑥ EXPERTS' HOUSE
- ⑦ COVERED WAY
- ⑧ ELEVATED TANK
-  ELECTRICAL POWER LINE
-  TELEPHONE MAIN LINE

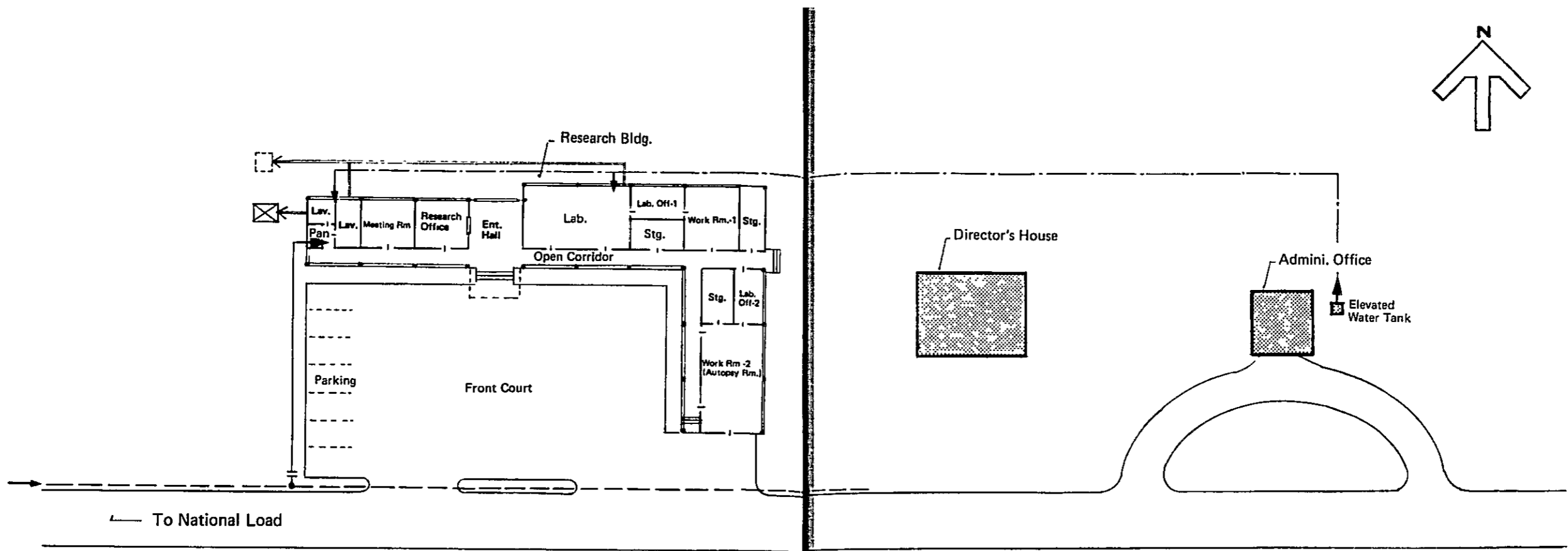
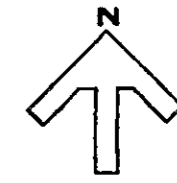
**MAIN CENTER
ELECTRICAL & TELEPHONE SYSTEM 07**








LEGEND

- WATER SUPPLY LINE
- DRAINAGE LINE
- ☒ SEPTIC TANK
- ELECTRICAL POWER LINE



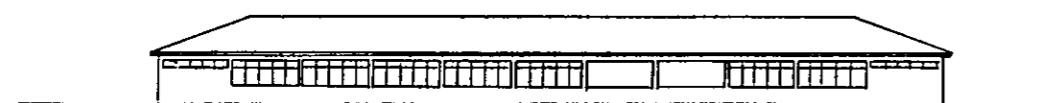


- LEGEND**
-  EXISTING BLDG.
 -  WATER SUPPLY LINE
 -  DRAINAGE LINE
 -  SEPTIC TANK
 -  ELECTRICAL POWER LINE

LIVEK RESEARCH SUB CENTER PLAN 1:500 09



South Elevation



North Elevation



South Elevation



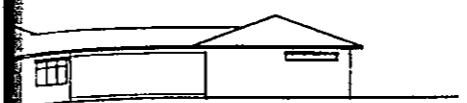
North Elevation



South Elevation



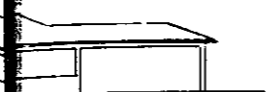
North Elevation



East Elevation



West Elevation



West Elevation



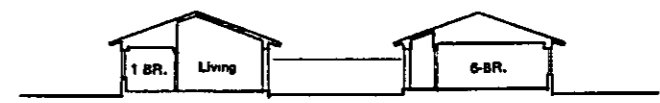
East Elevation



West Elevation



East Elevation

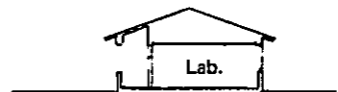


Section-A



Elevation-A

Elevation-B



Section - A



Elevation - C



Section - B



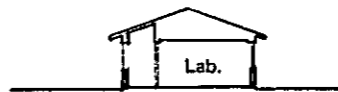
Section - A

Rice Research Sub Center Research Bldg.

Main Center Expert's House
Rice Research Sub Center Liaison House



Section - A

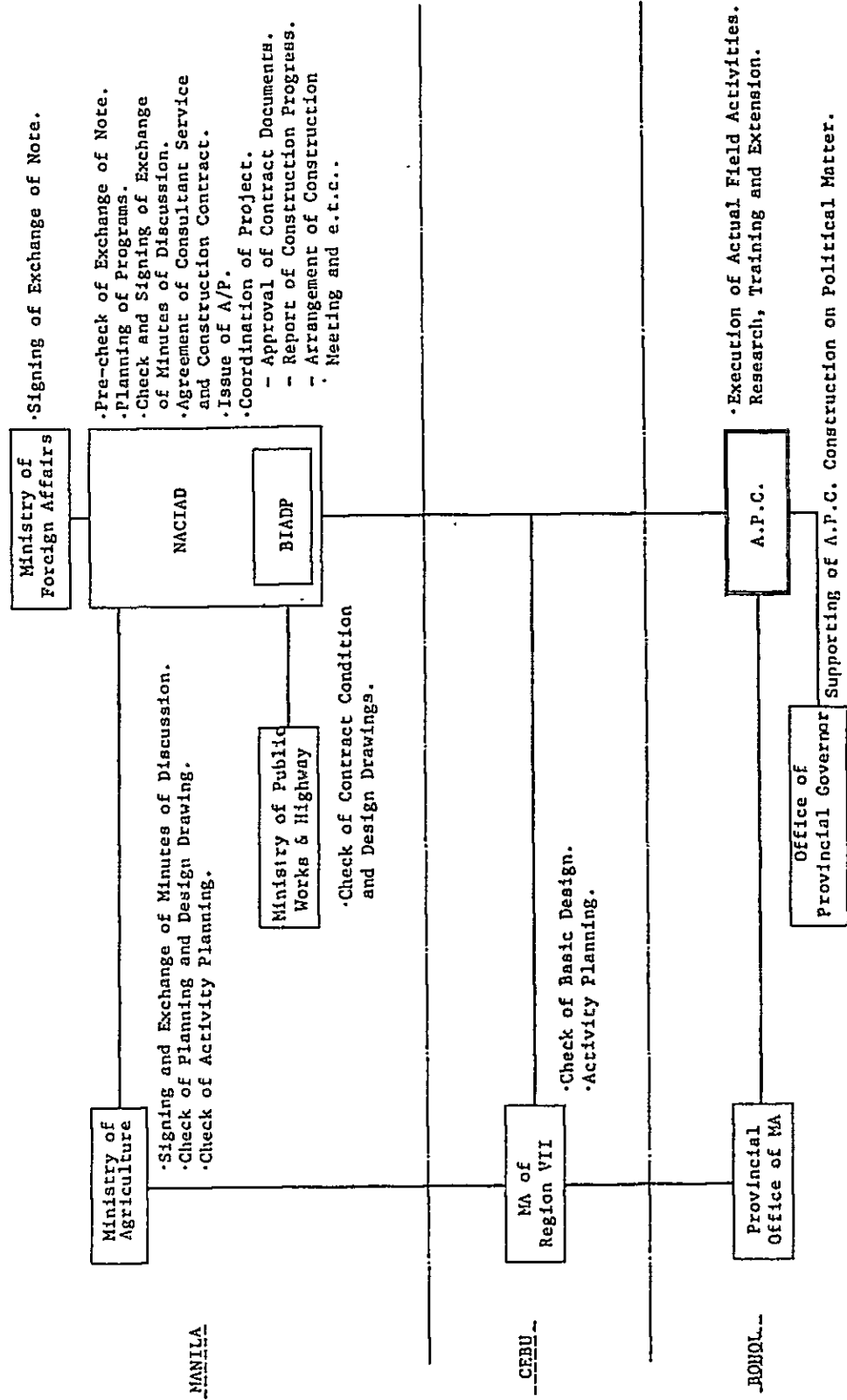


Section - B

Livestock Research Sub Center Research Bldg.

ELEVATION & SECTION 1:500 10

Fig. 7-1-1 Organization and Function for the APC Project



CHAPTER 7. PROJECT EXECUTION PLAN

When construction of the APC is implemented based on the system of grant aid cooperation from the Government of Japan, project execution will be planned as follows:

7-1. Body for Project Execution

The governing agency on the Philippine side for planning and implementation of the APC Project is the BIADP under the control of the NACIAD, and this committee acts as the window in charge of promotion of this project.

BIADP is in charge of contracting and so forth related to various proceedings for contract such as implementation design for construction of the APC, agreement for supervision, agreement for construction work and bank arrangements, but check of various documents related to construction work will be performed by the MPWH. The MA makes check of contents of plan and implementation design. After take-over of facilities, the APC will be operated under the control of the MA, and the Region VII of the MA makes direct supervision. Accordingly, contents of activities of the APC and the basic plan are also checked by the Region VII of the MA.

A structure that causes no problems to advancement of construction works will be established during construction of the APC, with a BIADP's liaison officer resident at site. The signer on the Philippine side for conclusion of official documents to be exchanged will be the Minister of Foreign Affairs, but the work of preadjustment of official documents to be exchanged will be made by BIADP in NACIAD and the MA.

Table 7-1-2 Organization and Function for the APC Project

Item	Concerned Agency	Function
Request of Grant Aid	Ministry of Agriculture	Making request plan.
	BIADP	Confirmation of request plan.
	NACIAD	Request of Grant Aid.
Exchange of Note	NACIAD	Pre-check of Exchange of Note.
	BIADP	ditto
	Ministry of Foreign Affairs	Signing of Exchange of Note.
Agreement of Consultant Service and Construction Contract	Ministry of Public Works Highway	Check of Contract Documents and Design Drawings.
	Ministry of Agriculture	ditto
	BIADP	ditto
	NACIAD	Signing of Agreement of Consultant Service and Construction Contract.
Coordination of Construction Works	Ministry of Public Work Highway	Check of Construction Progress. Execution of Construction Work to be undertaken by philippines side.
	BIADP	Check of Construction Progress.
Operation and Administration	Ministry of Agriculture	Operation and Administration of Facilities.

7-2. Construction Execution Plan

7-2-1. Construction Planning

For implementation of construction of the APC, necessary site preparation and clearance will be made to permit commencement of construction as soon as design documents for the APC are completed and the contractor is determined.

After decision of implementation of the project, staff members to be in charge of practical affairs related to execution of construction will be selected with BIADP as the nucleus, and when the APC Construction Committee is established, it will become possible to make clear and quick correspondence such as adjustment of opinions related to construction inside of the Philippines, provision of information as well as instruction and communication to the consultant and the contractor.

Regarding the work execution plan, time schedule will be examined in detail between the APC Construction Committee, consultant and contractor and suitable time for commencement of works included in the range to be worked under the burden of both nations will be planned, and in particular, procurement as well as carry-in to the field of materials and equipment and setup of the time of execution and mounting will be made.

There is no major distinction between dry season and rainy season in the time of execution of work, but the time of commencement of work matched with local weather conditions will be planned in such a manner that earth work, foundation work and structural body work are performed during the period in which rainfall is minor. As procurable materials and equipment are limited in Bohol, procurement of materials and equipment from remote places such as Cebu and Manila or from Japan should be considered. Furthermore, as construction will be executed at two different places, it is necessary to sufficiently adjust the period required before carry-in of procured materials and equipment to the fields and matching to time of work execution using locally procured materials in order to setup a time schedule program that does not allow occurrence of waiting or back-off.

7-2-2. Supervising Plan

The contents of supervision of construction works are to make cooperation for conclusion of a suitable construction contract, to materialize the intent of design, and to guide and instruct the contractor based on a fair stand point so that executed works match the contract. In concrete, supervision is composed of the following operations.

1) Cooperation related to construction contract

Selection of contractor, decision of method for construction contract conclusion, draw-up of draft of construction agreement, survey of breakdown of construction expenses, witnessing of conclusion of construction contract.

2) Inspection and approval of working drawings, etc.

Inspection of working drawings submitted from contractor, materials.

3) Guidance for construction

Examination of construction program, time schedule and so forth, provision of guidance to contractor, reporting of progress of construction to the owner.

4) Cooperation on proceedings for approval of payments

Examination of contents of debits notes, etc. related to construction expenses to be paid during and after construction work and cooperation on the proceedings.

5) Witnessing of inspections

Inspection of each finished form during construction period from commencement to completion and provision of guidance to the contractor.

After confirmation of completion of construction and of implementation of contracted conditions, the consultant witnesses take-over of the object of the contract, and terminates his operations upon acceptance and approval by the owner.

For this project, advancement of construction, payment proceedings and required matters related to completion and take-over are reported to those concerned with the Government of Japan.

7.3. Scope of Work

The construction project of APC includes the following facilities as requested to the Government of Japan to build up under its grant aid cooperation.

(a) Main Center

- 1) Research and training building
- 2) Canteen
- 3) Office for field trials
- 4) Dormitory and liaison office
- 5) Experts' house (4 flats)
- 6) Green house (1 terrace house)
- 7) Covered way
- 8) Elevated water tank

(b) Rice Research Sub Center

- 1) Rice research building
- 2) Liaison house

(c) Livestock Research Sub Center

- 1) Livestock research building

However, the scope of work as defined above does not include construction work of any such outdoor facilities as utility service terminals for supply of water and electricity, telecommunication lines and plantation in the yard.

7-4. Execution Schedule

For construction of the APC, official notes will be exchanged between the Government of the Philippines and the Government of Japan regarding grant aid cooperation from the Government of Japan. The operations thereafter are generally divided into three stages, i.e., development design, tendering and construction.

Development design

Detail drawings for construction work and documents for tender will be drawn up based on the basic design report. Advance preliminaries, interim preliminaries and final preliminaries will be made in the mean time with relevant agencies on the Philippine side. The required period is about three months.

Tendering

Tender is the period up to signing for contract after notification of tender, examination of qualification of tenderers, cost calculation and assessment. A period of about two months is scheduled after completion of development design.

Construction

Construction will be commenced with an approval from the Government of Japan after conclusion of construction contract. As judged from the scale of the APC and contents of facilities, it is anticipated that the construction period is about twelve months, provided that procurement and carry-in of construction materials and equipment to fields are favorably made.

Implementation schedule of technical cooperation

The activities of technical cooperation from Japan will begin in March, 1983. The number of technical cooperation staff from Japan will be increased after completion of APC facilities. The period of technical cooperation is five years including the preparatory period.

7-5. Procurement

For implementation of construction of the APC, local procurement is basically considered regarding procurement plan for construction materials and equipment, as almost all of principal construction materials and equipment are available in the Philippines. However, they will be brought in from Manila and Cebu, as they are not available in Bohol.

Reinforcing bars, air conditioners, transformers and so forth, however, are very expensive although they are procurable. According, it is considered to be better to adopt procurement from Japan in which these articles are available at low prices. The outline of construction material and equipment procurement plan is considered as follows.

1) Materials and Equipment Scheduled to be Locally Obtained

Cement and aggregate (sand, gravel)

Concrete blocks

Timbers in general

Asbestos cement sheet

Wooden fittings

Corrugated galvanized sheet iron (for roofs)

Sheet glasses of various types

Paints

Interior finishing materials

Equipment for construction (batcher plant, pump truck, crane, etc.)

Materials and equipment for temporary use

(plywood, supporting work, scaffolding materials, tools, etc.)

Pipes (white steel gas pipes, lead pipes)

Electric cables and conduits

General lighting fixtures, receptacles, switches

Sanitary equipment

General furniture and fixtures for office works

2) Materials and Equipment Scheduled to be Delivered from Japan

Reinforcing bars and light gauge steel

Air conditioners

Pipes (PVC pipes)

Pumps

Transformers

Generators

Panels

Equipment for research

CHAPTER 8. OPERATION AND MAINTENANCE

8-1. Administration and Maintenance System

It is necessary to secure a structure for suitable conduct along with contents of activities as well as a upkeep control structure in order to smoothly conduct APC's operations and activities. The organization chart of the APC and staff plan classified by division are as shown in Fig.3-3-1. It is planned that conduct and upkeep of the APC are made by four divisions, i.e, administration, research, extension and training/information. However it has been planned that a management committee and a technical committee are established in order to conduct the APC more integrately and efficiently. The management committee will be conducted in a tie with BIADP and will become the main post for generalization of operation and maintenance of the APC. On the other hand, the technical committee will bear a part of conduct structure related to contents of activities of the APC with specialists dispatched from Japan under technical cooperation added as principal members.

The administration division will be in charge of maintenance and inspection of buildings as well as operation and maintenance of equipment and machinery.

8-2. Operation and Maintenance Planning

Planning of facilities should fully incorporate consideration for making upkeep and control easy. But regarding upkeep and control of buildings as well as methods for operation, handling, maintenance and control of building equipment and research equipment, it is necessary to guide suitable methods by conducting demonstrations and operation tests at the occasion of completion and take-over of buildings together with presentation and relevant explanation of necessary related documents.

It is desirable that the necessary related documents for control of buildings are composed of methods for use and methods for clean-up and maintenance and that the necessary related documents for building equipment and research equipment are composed of methods for use,

suitable running time and methods for maintenance and inspection. Contact addresses and phone numbers of staffs of manufacturers and distributors should also be indicated in correspondence to the necessity for repair, servicing and procurement of spare parts.

8-3. Operation and Maintenance Costs

Expenses required for various activities such as researches, training, extension and administration conducted at the APC, expenses for upkeep and conduct of facilities and so forth will be covered by the budget on the Philippine side.

On the other hand, there also are some items of construction which are born by the Philippine side during construction of facilities. The following figure indicates the flow of each of the budget related to construction of the APC and the budget related to conduct upkeep control of the APC. The flow of the budget on the Philippine side during construction is such that based on the budget plan drawn up by BIADP, the MPWH makes budget demand to the Ministry of Budget (MOB), the budget flows to BIADP from the MOB through the MPWIH, and is then used for construction of the APC.

As for the budget of the Philippine side for the conduct after opening of facilities, the MA makes budget demand to the MOB based on the budget planned for the APC. The budget flows to the APC from the MOB through the MA, and is used for conduct upkeep control.

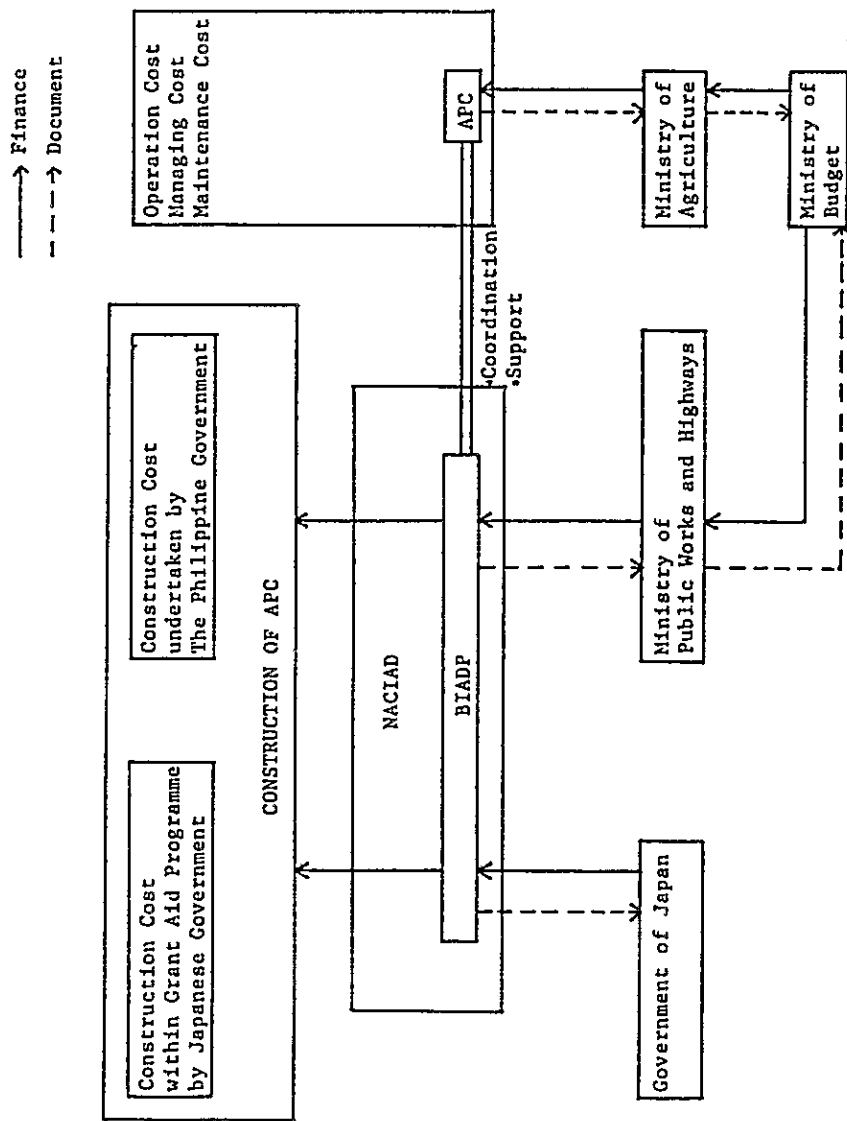
At this occasion, BIADP makes assistance of required works of the APC relevant to budget demand.

According to the material obtained from NACIAD (Refer to the attached tables), the following budget is assumed for the first year, for instance, for operation of the APC.

Administration expenses (including personnel expenses)	1,068,120
Expenses for activities	1,634,018
<hr/>	
Total	2,702,138 pesos

Trial calculation was made assuming simultaneous operation rate as 100%. But it is rare at the training room and so forth that equipment are used throughout the month without intermission, and operating expenses in practice will become considerably less than trially calculated values.

Fig. 8-3-1 Flow of Finance



Trial calculation of electric charges

1) Conditions for calculation

The electric energy consumed per month under maximum load is the object.

It is assumed as 8 hours working per day and 25 days working per month.

2) Approximate capacity of air conditioners, general equipment and lighting fixture: Refer to Table 8-3-2

3) Trial calculation of power rates

Main center

$$\begin{aligned} \text{Rates} &= (0.71 \text{ P/KWH} + 0.01 \text{ P/KWH}) \times \text{Used Electricity} \\ &= (0.71 + 0.01) \times 33,500 \\ &= 24,120 \text{ pesos/month} \end{aligned}$$

Rice research sub center

$$\begin{aligned} \text{Rates} &= (0.71 + 0.01) \times 5,500 \\ &= 3,9620 \text{ pesos/month} \end{aligned}$$

Livestock research sub center

$$\begin{aligned} \text{Rates} &= (0.71 + 0.01) \times 4,000 \\ &= 2,880 \text{ pesos/month} \end{aligned}$$

If the simultaneous use rate is assumed as 0.5, for instance, rates of around 21,780 P/month will be required.

Trial calculation of water rates

Trial calculation of water rates in the case where supply water from the water works system is used at the main center

1) Roughly calculated water supply volume

42 m³ calculated earlier (Refer to 6-9-2) is used as the daily roughly calculated water supply volume.

$$42 \text{ m}^3/\text{day} \times 25 \text{ days/month} = 1,050 \text{ m}^3/\text{month}$$

2) Water rates

Basic charge Up to 20 M³ : 20.8 pesos

Consumption rates 1 M³ : 0.84 pesos

If the rate is 100%,

$$\begin{aligned} \text{Monthly rates} &= 20.8 \text{ pesos} + (1,050\text{m}^3 - 20\text{m}^3) \times 0.84 \text{ pesos} \\ &= 20.8 + 865.2 \\ &= 886 \text{ pesos/month} \end{aligned}$$

Table B-3-2 Calculation of Electricity for Mechanical Lighting Facilities

Site	BLDG. Name	Load Capacities		Charge of Usage (KWH/Day)
		Lighting recep- tacle load(KVA)	Power load (KVA)	
Main-Center	Research Training BLDG.	120	65	18,500
	Canteen	10	-	1,000
	Office for Field Trials	50	15	6,500
	Experts House	20	15	3,500
	Liaison Office and Dormitory	30	10	4,000
	Sub-Total	230 (KVA)	105 (KVA)	33,500 (KVA)
Rice Research Sub-Center	Research BLDG.	35	10	4,500
	Liaison House	8	2	1,000
	Sub-Total	43 (KVA)	12 (KVA)	5,500 (KVA)
Livestock Research Sub-Center	Research BLDG.	35 (KVA)	5 (KVA)	4,000 (KVA)

Trial calculation of APC operation and maintenance cost

The annual operation and maintenance expenses of the first year of the APC were trially calculated as follows based on materials collected during the survey and trial calculations indicated above.

Personnel expenses (salary, wage)	1,236,000 pesos
Training expenses	147,000
Utilities expenses for running equipment	272,000
Facilities maintenance and control expenses	} 865,000
Equipment, materials, consumables expenses	
Vehicle upkeep expenses	
Miscellaneous expenses	25,000
<hr/>	
Total	2,771,000 pesos (= 83,130,000 Yen)

CHAPTER 9. EVALUATION OF THE PROJECT

This is to evaluate both usefulness and fitness of the implementation of the APC Project to the existing communities.

(1) Socio-economic Evaluation

In the recent years, the Philippines have been on the remarkable tendencies such as 'increase of difference of living level between urban area and rural area', 'concentration of capital into urban areas' and 'unbalance of national income'. Under these circumstances, it is now one of main supports for the nation's economic development plan to promote development of the back ward region, especially the rural area of the country, in view of necessity to correct the unbalanced situation.

In order to try to solve those current problems in each under-developed area, it is considered most effective to carry out the development project of appropriate and well-balanced pattern adaptable to local peculiarities in each area, that is to say, what is called the regional integrated development project. Because of high development priority given to those under developed areas in the Philippines, the NACIAD provides study and guidance on the development plan of integrated pattern in each local area. In particular, the Province of Bohol is designated as one of the priority areas for implementation of the regional integrated development project. Because of this, the development project is going on under the master plan of BIADP which now attracts high expectancy among people involved.

As for the Province of Bohol, any one can hardly predict that agriculture would be replaced by any other industry as the main provincial typical industry. This tendency would conceivably remain unchanged long ahead in the future. Therefore, the Master Plan fully reflects the need to enhance productivity in the agricultural sector as the target of top importance, and high priority is naturally given to agricultural development and its fundamentally required infrastructural development. In view of the geographical condition for the Province of Bohol, it is neared to the city of Cebu known as a large consuming

center of agricultural products. Together with this, the Province has high potentiality for future agricultural development because of its plentiful arable acreage within its administrative territory and is expected to contribute largely toward establishment of the self-sufficient system of foods now being aimed at by the central government.

In an attempt to evaluate the APC Project which is deemed as the top priority project in the Master Plan, from the aforesaid viewpoints, it may be concluded that the Project is proposed (1) to encourage research and development of suitable agricultural technology from both aspects of basic and applied studies, (2) to improve the quality of conventional instructors in the agricultural field and (3) to propagate the suitable technology through field activities of those agricultural instructors, ultimately aiming at development and propagation of new technologies locally acceptable to the Province of Bohol.

(2) Technical Evaluation

The scale of APC facilities is planned with full assurance to make them display their working functions, though it is not necessarily of sufficient capacity to satisfy needs of activities.

The Project will make it possible to reduce its cost, if it is graded suitably by comparison with any other existing facilities of similar grade and it makes positive use of any equipment, materials and labor locally available. In addition to that, the Project can be evaluated as being able to contribute much toward fostering of the local construction industry.

(3) Financial Evaluation

In view of the proposed project site conditions, the work for infrastructural development will be burdened to the cost of the Philippines. However, since such cost would be relatively minor, the result of evaluation can reveal that there will be no problem in respect of the development cost sharing.

Under the construction plan of the APC, study is being made for review of necessary items of facilities and equipment to be suited for local conditions. Maintenance may conceivably be easy if it can be done properly with care. According to the result of estimation by the basic study mission, the aggregate total of annual operating and maintenance expenses in the initial year is estimated at about 2,771,000 pesos (equivalent nearly to 83,000,000 yens) which may be broken down into 1,236,000 pesos for payroll cost, 147,000 pesos for training expense, 272,000 pesos for operating of facilities and light and fuel costs, 865,000 pesos for facility and vehicle maintenance and material and supplies cost and 251,000 pesos for miscellaneous expenses.

Meantime, the Philippines estimate a budget of 2,702,138 pesos for operation and maintenance in the first year. Though it is a little lower than estimated on the Japanese side, the result of evaluation can ensure that the APC would not be facing any financial deficiency in both operation and maintenance, since necessary equipment and materials can partially be covered by furnishing of equipment and materials under the Japan's project-oriented technical cooperation, if it is executed by agreement.

(4) Evaluation on Administration System

The administration system proposed for the APC will be organized by four (4) departments of Research, Training and Information, Extension and Administration under the supervision of the Project Manager appointed by the MA. The organizational system may conceivably be fully suited to achieve both purpose and function of the APC. Assisting the Project Manager are two committees; the one is named the Management Committee planning the guideline for operation of the APC and coordinating the activities with the other agriculture-related organizations and the other is the Technical Committee providing technical advisory services pertaining to the activities of the APC. Joining in this organizational system is worthy of appraisal with those committees organized for smooth and rationalized administration of the APC.

Total number of staff to be engaged in the APC operating activities will amount to 103 persons. Those senior staff at supervisory or

managerial level including expert research staff will be transferred from the Bureau of Agricultural Administration and the assistant posts for those research staff will be filled with new graduates from the Bohol University and other schools. It is expected that the APC will be operated most effectively through improved skill and capacity of the APC personnel if the staff can be accepted into Japan for training and the expert can be dispatched from Japan by implementation of the project-oriented technical cooperation program.

CHAPTER 10. CONCLUSION AND RECOMMENDATIONS

(1) Conclusion

As stated in the preceding Chapters, after evaluation of the Project aiming at promotion of agriculture in Bohol in respect of social usefulness and economic effect of the Project, conclusion has been reached that this APC Project is of full significance especially in the Philippines where one of the major targets set up for the economic development plan is to promote development of the rural area as the underdeveloped region, to mitigate the existing gap between urban and rural areas and to strengthen the system of self-sufficiency in foods supply. Obviously, both financial and technical aids from Japan can ensure great effect in respect of the pending matters for the Government of the Philippines such as construction of the APC and supplies of equipment and materials, thus contributing largely toward materialization of the regional integrated development plan, agricultural development and economic growth in the country.

(2) Recommendation

Successful result of agricultural development by smooth operation of the APC and full display of its operating functions would depend largely upon the governmental self-supporting effort on the Philippine side, and it is recommended that the following will be taken into account for the implementation of the Project.

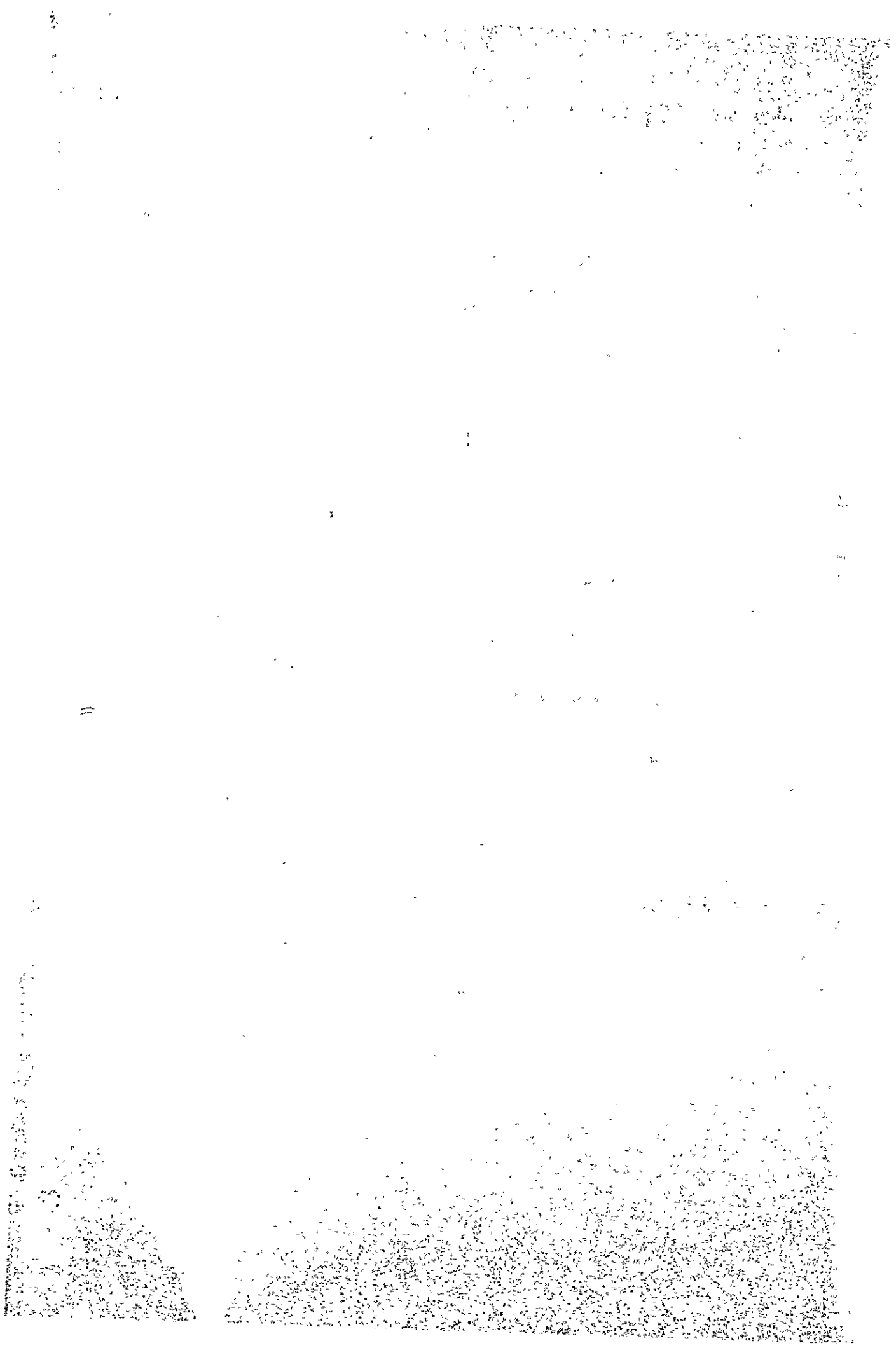
- 1) The APC is the agricultural executing agency organized under the jurisdiction of the NACIAD. However, since it will be operated mainly by administration of the MA, many of the working staff for the APC will be recruited from the Region VII of the Ministry. Arrangements must be made by earliest selection of eligible staff for the APC so as to make them better familiar with design details of the facilities, so that they shall be able to enter into operation of the APC facilities without difficulty after completion of the construction project.

- 2) Since the proposed trainees under the educational program for agricultural instructors as planned by the APC are the workers actually engaged in daily routine works, the program is formulated, for the time being, on a short-term basis in principle. In the future, however, effort must be made to boost up the technical level of such instructors by positive introduction of the training program corresponding to the cropping period by kinds of crops and the training program covering medium or long term for new graduates for fostering to instructors.
- 3) The time for completion of the Project may depend vitally upon the timing for preparatory work in connection with the construction schedule for infrastructural works basically to be performed by the Philippine counterpart in respect of the APC construction project and the timing of delivery into the construction site of necessary equipment and materials for construction. For this reason, it is requested that prompt measures should be taken on the Philippine side institutionally for establishment of efficient formalities in respect of procedures for import of equipment and materials.
- 4) Engineering staff to be actually responsible for maintenance of buildings and handling of each equipment and materials must be appointed during performance of construction, so that they may get fully familiarized with the appropriate way of maintenance for facilities and equipment to be provided for the APC in order to eventually establish the regular inspection system and the supplementary system of consumables at regular cycling period.

- 5) In order to ensure full display of the APC's functions, the budget must be secured to cover estimated costs for maintenance, including necessary fixtures for operation of the APC which should be provided on the Philippine side after completion of the construction.

APPENDIX

- 1. Dispatch of the Survey Team**
- 2. Minutes of Discussion**
- 3. Letter from NACIAD**
- 4. Project Site**



1. Dispatch of the Survey Team

Survey teams have been dispatched for two times basic design survey team and final survey team.

1) Member List of the Survey Team

Basic Design Survey Team (Sep.28 - Oct.14, 1982)

Team Leader	Mr. K.Matsuoka	Basic Design Division Grant Aid Department JICA
Specialist of Cooperation	Mr. H.Saito	Technical Agricultural Development Cooperation Department JICA
Architect (General) (Structural) (Planning)	Mr. R.Hirano Mr. T.Hamajima Mr. M.Nagadomi	Kume Architects-Engineers ditto. ditto.

Final Survey Team (Jan.19 - Jan.29, 1983)

Team Leader	Mr. K.Matsuoka	Basic Design Division Grant Aid Department JICA
Architect (General) (Planning)	Mr. R.Hirano Mr. M.Nagadomi	Kume Architects-Engineers ditto.

2) Cooperative Officials in the Survey

Embassy of Japan, Manila Mr. Yoshikazu Matsuura	First Secretary
JICA, Manila Office Mr. Toshikazu Miura	Director
Mr. Hiroyuki Arai	Officer

NACIAD & BIADP

Mr. Jose P. Leviste, Jr. Executive Secretary, NACIAD
 Mr. Andves A. Limcaoco. Director, NACIAD
 Mr. Raynaldo E. de Sagun Proj. Director, BIADP
 Mr. Mauricio C. Feliciano Deputy Director, BIADP

MPWH

Mr. Rogalio A. Mallonga Director, Bureau of Design
 Mr. Eleuterio C. Pallasieni Supervising Architect,
 Bureau of Design
 Mr. Lorenzo P. Espeleta Chief, Architectural Division,
 Bureau of Design
 Mr. Maximo S. Hernando Chief, Mech.-Elec.
 Division, Bureau of Design

MA, Manila

Dr. Edgardo C. Quisumbing Director,
 Agricultural Research Office
 Miss Jovita M. Corpuz Senior Staff Officer
 Mr. Emiliano P. Gianzon Assistant Director for Research,
 Bureau of Plant Industry
 Mr. Honorato B. Santos Architect Engineering Division,
 Bureau of Plant Industry

Region VII MA, Cebu

Mr. Celso T. Palma Gil Regional Director
 Mr. Constantino F. Lucero Asst. Regional Director
 Mr. Auastacio L. Delmo Acting Chief,
 Operating Division

Bohol Province

Mr. Rolando Butalid Governor
 Mr. Verevando M. Dumadog P.D.S.
 Provincial Development
 Coordinator

Provincial Office MA, Tagbilaran

Mr. Mauro M. de la Cruz Executive Officer
 Mr. Aniano F. Bondal Asst. Officer
 Mr. Nicanor S. Ferrer Bohol Experiment Station
 In-Charge

Tagbilaran City
Mr. Rocha

Mayor

Reference

Dr. Herminio D. Marcial

Quarantine Vet. Officer
B.A.I.
Alabang Stock Farm

Mr. Julian G. Ballaran

Secretary
Regulation Board
Professional Regulation
Commission

2. Minutes of Discussion

The Basic Design Survey Team and the Government of the Republic of the Philippines have held a series of discussions and exchanged their views. The both parties summarized their agreements on Minutes as the result, and exchanged their signatures by Mr. Matsuoka, Team Leader, and Mr. De Sagun, Project Director of BIADP.

MINUTES OF DISCUSSION

ON

THE ESTABLISHMENT OF AGRICULTURAL PROMOTION COMPLEX

IN

THE REPUBLIC OF PHILIPPINES

At the request of the Government of the Republic of the Philippines (GOP) for a grant capital aid in establishing the Agricultural Promotion Complex (APC) in Bohol, the Government of Japan (GOJ) has sent a Mission to carry out the Basic Design Study (the Study) on the APC Project (the Project) from 28th September to 14th October 1982.

The Mission has carried out field survey and held a series of discussions with the National Council of Integrated Area Development (NACIAD) under the Office of Prime Minister, Ministry of Agriculture and concerned authorities of the GOP.

As a result of these surveys and discussions, both parties have agreed to recommend their respective Governments and authorities concerned to examine the major points of understanding reached between them, attached herewith, toward the realization of the Project.

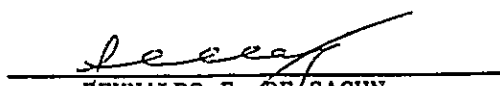
8th October 1982

Manila



KAZUHISA MATSUOKA

Leader of the JICA Mission



REYNALDO E. DE SAGUN

Project Director, Bohol Integrated Area
Development Project, NACIAD



ARSENIO A. FORTIN

Chief, Special Projects Division
National Food & Agriculture Council
Ministry of Agriculture

MAJOR POINTS OF UNDERSTANDING

Five Year Plan of Operation of the Project

1. Both parties have agreed with the contents of the proposed Five Year Plan of Operation which is included in Appendix I.
2. Budgetary requirement for the activities of research, training, extension, administration and etc., the operation and maintenance of the APC facilities and other expenses necessary for APC will be re-estimated and submitted to JICA by Philippine side until the end of October in 1982.

Construction Site of APC Buildings

3. APC Main Center buildings will be established in a land area of 9 ha. owned by the provincial and city government located in Dao, Tagbilaran. A sub-center building, which will mainly functional as a research field of rice research activities, will also be established in Ubay. However, appropriate site of the sub-center will be decided through the discussions with Technical Cooperation Team by the end of October 1982.

Basic Design

4. Japanese side will carry out basic design of buildings necessary for APC activities excluding livestock sub-sector, taking into consideration of the results of past design works for APC.
5. Some amendment of the past design will occur in the coming basic design as follows:
 - (i) Four laboratories, consisting of rice laboratory, upland crop laboratory, soil and fertilizer laboratory and agriculture mechanization and irrigation laboratory, will be designed in the main center.
 - (ii) Administrative block of the main center will include spaces for Technical Extension Division in addition to spaces for Administrative Division.

(iii) Since the activities in Ubay sub-center was changed from training to research, floor plan will be revised.

Detailed Design

6. Detailed Design of APC buildings should be carried out by Japanese consulting firm, if the Japanese Grant will be extended to the Project.

Executing Agency

7. Executing Agency of the preparatory and implementing works of the Project is Bohol Integrated Area Development Project of the NACIAD.

Livestock

8. Philippine side had requested Japanese side to fund the buildings, facilities and equipment that will be required to support livestock research which is included in the APC activities.

Japanese side has replied to convey this matter to the Japanese authorities concerned.

AGRICULTURAL PROMOTION COMPLEX
PLAN OF OPERATION (5-YEAR PERIOD)

1.0 Background

Upon request of the Philippine Government, the Japanese Government through the Japan International Cooperation Agency (JICA) dispatched a series of technical missions to Bohol to undertake a Master Plan Study for the integrated area development of Bohol. On December 1979, the JICA Team in close coordination with the National Council on Integrated Area Development (NACIAD) and other concerned agencies completed the Master Plan Study for the Bohol Integrated Area Development Project (BIADP).

Since agriculture is considered as one of the most important leading sectors in Bohol, the establishment of the Agricultural Promotion Complex (APC) was identified to catalyze all agricultural developments in the province. The APC is envisioned to become the center for technology generation/packaging and dissemination. Towards this end, a 6-man JICA Survey Team was dispatched last March 1980 to conduct a study on the Technical Cooperation for the establishment of the APC.

Another Japanese Survey Team was dispatched last June 1981 to prepare a preliminary design of the APC. It was agreed then that the main center of the complex will be established in a 9-hectare lot provided by the Provincial and City Government of Bohol located in Dao, Tagbilaran.

A sub-center for the rice research activities will also be established in Ubay (where the Bohol Experiment Station or the Soil Demonstration Research Station of the Ministry of Agriculture is located). An extension unit of the APC which will be mainly involved

in the development of technology on paddy rice production was also identified in Bilar where the Bohol Agricultural College is situated.

2.0 Agricultural Profile

2.1 General

2.1.1 Topography

The island province of Bohol is rolling and hilly and has around 167 mountains. The eastern, western and southern coasts are elevated presenting a wall from one to six meters high which are broken in many places by streams that drain into plains along the coasts which are utilized as rice lands. Towards the interior, the lands are irregular that rise to an interior plateau.

2.1.2 Drainage

There are four major rivers that serve as the major drainage system of the province. This include among others the Loboc and Abatan Rivers in the southern portion.

2.1.3 Climate

The province is partially sheltered from the full effect of most air masses coming from the adjacent islands, thus the province received less precipitation. Maximum precipitation occurs during the months of June to October with the flow of the southeast winds although typhoons are not frequent. It is usually warm and dry along the coast and cold and humid in the interior.

2.2 Natural Resources

2.2.1 Land

Bohol has a total land area of 411,726 hectares broken down as follows:

Alienable and Disposable	-	340,420	hectares
Classified Timberlands	-	61,306	"
Unclassified Lands	-	10,000	"
Total		<u>411,726</u>	hectares

Most of the soils in Bohol are calcareous and only part originated from igneous rocks. Soils of these nature contain calcium carbonate which is usually low in organic matter content and as a result, nitrogen resultantly becomes the most limiting nutrient for crops.

2.3 Present Agricultural Situation

2.3.1 Agricultural Area, Production and Yield

The total area devoted to agriculture in Bohol in 1980 (Annex 2, Table 1) was approximately 236,490 hectares representing 57.4 percent of the province's total area.

Paddy rice, both irrigated and rainfed has the largest monoculture use. The total area devoted to rice is 49,048 hectares with a total production of 327,240 MT with an average yield of 6.7 MT/ha. Most paddy rice areas are found on alluvial plains, narrow valleys, plateaus and river terraces.

Coconut ranks first in hectarage. In 1980, coconut occupied 97,680 hectares with a production of 31,884 MT of copra or 95,652,000 nuts. The yield of coconut in terms of copra product was 3.2 MT/Ha. Coconut occurs on various parts of the island, along coastal areas, on alluvial plains, karst plains and alluvial valley. Coconuts are most often inter-cropped with corn, cassava, camote, banana and other diversified crops.

Corn is not widely grown in the province. It occupied 18,475 hectares in 1980 with a production of 34,085 MT with an average yield of 1.8 MT/Ha. Corn areas are found in valleys, alluvial plains, plateaus and rolling plains.

Rootcrops was planted in 40,684 hectares of land with a total production of 86,831 MT with an average yield of 2.1 MT/Ha. Rootcrops are grown in valleys, plateaus, gently rolling slopes and on hillsides with deep soil.

Banana occupied 27,595 hectares in 1980 with a total production of 444,963 MT with an average yield of 16.1 MT/ha. Banana is sometimes intercropped with coconut and in some cases, are planted along lot boundaries, creeks, rivers and roads.

Vegetables which include green leafy and fruits are planted in 3,008 hectares. Total production was reported

at 24,302 MT with an average yield of 8.0 MT/Ha.

2.3.2 Cropping Calendar and Cropping Intensity of Selected Agricultural Crops (Annex 2, Table 2)

Irrigated Rice

Irrigated paddy rice are planted twice a year. In some places, farmers can plant three times a year if early maturing varieties are used. The first crop is usually planted from October to November and harvested from March to April. The second crop is planted from May to June and harvested from September to November. This gives irrigated ricelands an annual cropping intensity of 2.0.

Rainfed Rice

Majority of the farmers plant twice a year. Sometimes the land is either left fallow or planted to other crops after the first cropping season. The first crop which is rice is usually planted from October to December and harvested from March to May. The second crop which is mostly legume is planted from May to July and harvested from September to December. The annual cropping intensity is 1.8 .

Corn

Although corn areas consist of small farms, some farmers still practice two croppings a year. The first crop is planted from March to May and harvested from

July to September. The second crop is planted from August to October and harvested from December to January. Annual cropping intensity is 1.8.

Cassava

Cassava is classified under perennial crops, thus cropping intensity is 1.0. The crop is planted from April to June and is harvested from September to December.

2.3.3 Cost and Returns Analysis of Major Crops

Rice

The total production cost per hectare per year amount to 5,616.28. Returns on the other hand averaged about ₱10,850.00 per hectare per year or a net profit of ₱5,233.72 per year (Annex 2, Table 3).

Corn

Producing corn in one hectare under one cropping season per year will entail a total cost of ₱2,132.98. For a 2-ton production per hectare valued at ₱1.4/kg., the estimated production return will be ₱2,800 leaving ₱667.02 net profit (Annex 2, Table 4).

Cassava

Since cassava is considered a perennial crop, it has only one cropping season per year. The expected net income of producing one hectare of cassava per year is ₱1,218.60 (Annex 2, Table 5).

2.3.4 Marketing of Major Crops

2.3.4.1 Rice

The wholesaler has the greatest share of the palay market. The greatest bulk of rice handled by dealers remained in Bohol. The marketing of palay is undertaken by private wholesalers. Of the total marketable surplus, about 80% are consumed in Bohol while the remaining 20% is shipped to Cagayan de Oro and Cebu City via Talibon, Ubay, Tagbilaran and Jagna.

2.3.4.2 Corn

Of the total volume marketed per year, about 75 percent was directly procured by buyers from farmers.

About 75 percent of the corn marketed is absorbed by private trader. Among the four types of buyers identified, wholesaler-retailer handled the greatest volume while the miller-wholesaler handled the least.

2.3.4.3 Cassava

Cassava is being sold in the market in the form of chips. On the average, a cassava dealer handled .5 tons per season. Of the total volume, about 96 percent was directly procured from farmers and the remaining were supplied by agents.

There are four outlets used by cassava dealers, namely: assembler-wholesaler, miller-wholesaler, wholesaler and consumer.

The total volume sold are brought to Tagbilaran where wholesaler collect and export them to Cebu and even Manila.

2.3.4.4 Copra

Dealers of copra have five outlets: wholesaler, wholesaler-exporter, manufacturer, assembler-wholesaler and wholesaler-exporter-manufacturer.

The bulk of copra handled by dealers went to towns accessible to transportation which include Tagbilaran, Jagna, Ubay and Talibon where large scale buyers are located. However, the volume is also expected to go out of the locality since there were no processors or manufacturers in the area.

3.0 Agricultural Thrusts/Priorities of the Province

3.1 Rice Production

If the present corn consumers in Bohol would shift to rice in the future, it is expected that the surplus of rice would easily be depleted. The goal therefore for rice production in Bohol is to produce more than 140,000 to 160,000 tons after 1986 whose average yield ranges from 70 to 76 cavans per hectare. Under this

projection, it is estimated that about 50,000 tons of surplus would be available in 1986.

3.2 Corn Production

According to the Bureau of Plant Industry (BPI), the yield of corn in 1978 is estimated around 1 ton per hectare. Corn production in Bohol in the '80's should be set to ensure the attainment of 2.0 tons per hectare which is the production yield level set in the Maisan 77. To attain however, a production target of 40,000 tons per year additional land areas will be cultivated.

3.3 Cassava Production

Marginal areas are commonly used for cassava where the soils are quite shallow and easily depleted of soil nutrients. Yield therefore is only 3.0 tons per hectare as against the national average of 7.98 tons per hectare.

There is a high potential demand for cassava in Bohol in order to support the raw material requirements of the proposed alcogas plant and the newly established starch processing plant in Carmen.

3.4 Coconut Rehabilitation and Improvement

The planting of coconut shall be concentrated in the towns of Ubay, Talibon, Trinidad and Buenavista. Because there is a strong demand of coconut oil in the world market, coconut production in Bohol shall be increased through replanting of high yielding varieties, expansion of coconut areas and improving management practices and technology.

3.5 Vegetable Production

With the expanding market in Metro Cebu , the demand for fresh vegetables will increase rapidly. Production of tomato, lettuce, cabbage, green and bulb onions will be promoted.

4.0 Project Description

4.1 Objectives

The major objectives of the Agricultural Promotion Complex (APC) are:

- 4.1.1 To develop appropriate and productive technology on calcareous soil through an integrated research and extension system.
- 4.1.2 To carry out basic and applied researches, field trials and farmer demonstration on various crops and livestock in coordination with the Ministry of Agriculture and other concerned agencies.
- 4.1.3 To facilitate technology transfer through training and seminars involving farmers, farmer leaders and technicians.
- 4.1.4 To establish linkages with existing research and experiment stations through joint undertaking and technical cooperation.

4.2 Priority Activities of the APC

The Agricultural Promotion Complex (APC) will have the following areas of concentration: research, training and extension. Presented below is the five-year operational plan of the APC which incorporates the thrusts and priorities of the province and the Ministry of Agriculture.

4.2.1 Research

4.2.1.1 Strategies

The thrusts of research projects consist of basic and applied researches in order to generate, verify and package technologies for adoption by farmers thereby increasing production and income.

To accomplish basic research in the APC, the following strategies will be carried out:

- a. Conduct of research studies on the development of modern and effective packages of technology.
- b. Promotion of packages of technology for specific soil characteristics, particularly on soil location and degree of deficiency of micro-nutrients.
- c. Establishment of linkages with other government agencies which support agricultural research.

Applied researches will be undertaken on farmer's fields as a basis for verification of technology developed and packaging them for assimilation and adoption of farmers in Bohol.

These will be carried through:

- a. Gathering of available and appropriate technology and testing them under specific agro-climatic locations.

- b. On-farm verification of the applicability of the technology developed. This will be done in as many locations in Bohol, preferably in the farmer's fields to provide direct comparison between farmer's practice and the recommended package of technology.
- c. Coordination with the Regional Integrated Agricultural Research Station (RIADRS) in order to have a viable implementation of the project.
- d. Provision of all necessary inputs with a corresponding counterpart from the farmers in terms of land and labor.

4.2.1.2 Targets

A total of 85 basic and applied researches will be programmed for a 5-year period broken down as follows:

	<u>BASIC RESEARCH</u>		<u>APPLIED RESEARCH</u>	
	<u>No. of Studies</u>	<u>No. of Researchers</u>	<u>Studies</u>	<u>Researchers</u>
Cereals	4	2	14	3
Vegetables & Legumes	5	2	9	2
Fruits	2	1	6	2
Beverages & Spices	2	1	3	1
Root Crop	2	1	7	2
Soils	2	1	7	4
Livestock	7	3	5	2
T O T A L	24	11	61	16

The list of priority research projects is presented in Annex 2. Table 6.

4.2.1.3 Budgetary Requirements

The research component will entail a total cost of ₱5.5 Million for a period of 5 years (Annex 2, Table 7).

4.2.2 Training

The training program envisioned under the APC is intended to enhance and accelerate the existing training activities of the Ministry of Agriculture in Bohol.

The specific areas of training will be concentrated on leadership training, project management, cooperative development, planning and budgeting, extension education and technical training on crops, livestock and soils.

4.2.2.1 Targets

A total of 30 training programs is scheduled for implementation within a 5-year period or an average of 6 training programs per year Annex 2, Table 8.

The targetted clientele will include District Agricultural Officers, Municipal Agricultural Officers, Subject Matter Specialists, Masagana-99 Technicians, Maisan Technicians, farmer leaders and farmers.

4.2.2.2 Budgetary Requirement

The total budgetary requirement of the training component will amount to ₱1.33 M for a 5-year period (Annex 2, Table 8).

4.2.3 Extension

The extension services of the APC will be carried out through extensive information campaign and the establishment of farm demonstration trials. Farm demonstrations will be established in the main center, sub-center and extension units of the APC to serve as "show windows" to farmers on better agricultural production practices. At the same time, the APC will encourage the participation of farmer cooperators in the establishment of farmer demonstrations.

In order to determine the economic returns derived from recommended farming practices on a hectare basis, farm demonstrations will be carried out in a uniform one hectare modules.

4.2.3.1 Targets

A total of 316 farm demonstration plots will be established within a 5-year period. Rice demonstration which include fertilizer and varietal trials, pesticide and spacing trials will total to 128 demo plots after 5 years.

Corn having the same trials as rice will have a total of 73 demo plots after 5 years.

Cassava demonstration on fertilizer and varietal tests will amount to 42 while multiple cropping which will employ rice based, corn-based and coconut based cropping systems will have a total of 73 demonstration plots within a 5-year

4.2.3.2 . Budgetary Requirements

The establishment of demonstration farms within a 5-year period will entail a total budgetary requirement of ₱1.15 million. The breakdown of costs is presented in Annex 2, Table 9.

5.0 Proposed Linkages of the APC with Other Institutions

In the implementation of the project, the Agricultural Promotion Complex (APC) in Bohol relates with other agencies besides the Ministry of Agriculture which is the lead agency, as a source of support/guidance, as a working partner and as a recipient/beneficiary of the project.

The APC is expected to draw support from the Philippine Council for Agriculture and Resources Research Development (PCARRD), the International Rice Institute (IRRI), the Visayas State College (VISCA), the National Irrigation Administration (NIA), the Philippine Training Center for Rural Development (PTC-RD), the Regional Training Center (RTC), the Farmers Training Center (FTC), the Regional Integrated Agricultural Research Stations (RIARS) and the Regional Crop Protection Center (RCDC).

The research activities of the APC will be coordinated with the researches of PCARRD, MA, IRRI, VISCA, BAC, RIARS, RCPS, NFA and NIA.

The RTC will conduct the training programs for technicians ; the PTC-RD for the training of farmer-leaders; and the FTC, jointly coordinating the farmers training program with the APC.

Technicians will also be given a chance to undergo further studies under scholarship grants from MA as well as advanced training at IRRI.

The last of the linkages is the downward connection reaching out to three sector-beneficiaries namely, the farmer, the household and some segments of the industrial sector (Annex 1, Figure 1).

6.0 Organization and Management

6.1 Structure

The APC shall be headed by a Project Manager to be designated by the Ministry of Agriculture (MA). A Management Committee shall be created composed of the Bohol Integrated Area Development Project (BIADP) Director as Chairman, the Regional Director of the MA as Vice-Chairman, the APC Project Manager as Secretary and Heads of PCARRD, VISCA, IRRI, NIA, BAC, NFA, PTC-RD, RTC, FTC, RIARS, BES and RCPC as members. The Management Committee shall serve as a policy making body for the APC.

Technical advice to the Project Manager shall be provided by a Technical Committee headed by the Provincial Agricultural Office (PAO) and Chiefs of MA departments (Crops, Livestock, Soils and Extension) as members. At the same time, technical expertise shall be provided by a pool of Japanese Experts through JICA.

The Project Manager shall be supported by four divisions, namely: the Technology Research Division (TAD), Technology Extension Division (TED), Training and Information Division (TID), and the Administrative Division.

6.2 Functions

6.2.1 Project Manager

The Project Manager shall be responsible in managing the implementation of activities of the APC according to the guidelines and policies set by the Management Committee.

6.2.2 Management Committee

The Management Committee shall prepare a mechanism to coordinate and integrate the research, training and extension activities of the various concerned agencies. It shall also

provide policy directions to govern the operation of the APC.

6.2.3. Technical Committee

Technical support shall be provided by the Committee on the different activities of the APC particularly in the preparation of their annual operational plan. At the same time, the Technical Committee shall act as a technical advisory body to the Project Manager.

6.2.4 Experts

Technical expertise shall be provided by the Japanese experts particularly along the lines of research, extension, farm engineering and mechanization and irrigation. They will also help in the formulation of annual operational plans of the different divisions.

6.2.5 APC Divisions

The Technology Research Division (TRD) shall propose, program and implement researches on crops and cropping systems, livestock, soils and soil fertility.

The Training and Information Division (TID) shall be responsible in the formulation, conduct and coordination of training programs in improving and instituting innovations in agriculture.

The Technology Extension Division (TED) shall develop and promote effective delivery systems of packaged technology.

6.3 Staffing and Arrangements

6.3.1 Number of Staff

Initially, the APC shall have 24 administrative staff and 78 technical staff to carry out its activities.

6.3.2 Arrangement

The regular staff of MA will be detailed to the APC. Replacement of regular staff will be provided for by the APC project so as not to disturb the regular operation of MA.

This shall be executed through a Memorandum of Agreement between MA and APC.

6.4 Operating Systems and Procedures

- 6.4.1 An annual operational plan and budget shall be prepared by each division;
- 6.4.2 The Project Manager shall be responsible in the execution of the plan prepared by the respective divisions and approved by the Management Committee;
- 6.4.3 The Project Manager shall prepare progress/status reports for submission to the Management Committee;
- 6.4.4 the Management Committee shall provide, NACIAD status reports, recommendations and general policies adopted;
- 6.4.5 the Management Committee shall at their own level of authority resolve problems and issues confronting the operation of the APC especially along the lines of integration and coordination.
- 6.4.6 The budget for the APC based on the operational plan prepared by the different divisions shall be indorsed by the Project Manager to the Management Committee for approval. Upon approval by the Management Committee, it will be passed through the Bohol Integrated Area Development Project Office for review and consolidation

in its regular annual budget.

NACIAD shall then indorse the budget request to the Ministry of Budget for appropriate action.

7.0 Implementation Schedule

ACTIVITY	Y1				Y2				Y3				Y5			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<u>Research</u>																
a. Formalizing linkages with other Research Institution (PCARRD, IRRI, VISCA, RIARS, BAC, etc.)	_____															
b. Preparation of Research Proposals (5-Year Program)	_____															
c. Implementation of Research Activities	_____															
<u>Training</u>																
a. Formalizing linkages with other Training Institutions (FTC-RD, FTC, RTC, ETC.)	_____															
b. Organization of Training Modules and Development of Training Scheme	_____															
c. Implementation of Training Activities	_____															
<u>Farm Demonstration</u>																
a. Identification and Screening of Farmer Cooperators	_____															
b. Establishment of Farm Demonstration	_____															

8.0 Total Budgetary Requirement

The implementation of the research, training and extension activities of the APC for a 5-Year period will entail a total budgetary requirement of ₦7.04 Million (Annex 2, Table 10).

TABLE 1. Area, Introduction and Yield of Major Crops, 1980

<u>Crops</u>	<u>Area (Hectares)</u>	<u>Production(MT)</u>	<u>Yield (MT/HA)</u>
1. Rice	39,048	327,240	6.7
2. Corn	18,475	34,085	1.8
3. Coconut	97,680	31,884	3.2
4. Rootcrops	40,684	86,831	2.1
5. Banana	27,595	444,963	16.1
6. Vegetables	3,008	24,302	8.0
Total	236,490	949,305	-

TABLE 2. Cropping Calendar and Cropping Intensity of Selected Crops

Crops	Cropping Intensity	Cropping Calendar			
		1st crop		2nd crop	
		Planting	Harvesting	Planting	Harvesting
Irrigated Rice	2.0	Oct.-Nov.	Mar.-Apr.	May-Jun	Sept. Nov.
Non-irrigated Rice	1.8	Oct.- Dec.	Mar.-May	May-July	Setp. - Nov.
Corn	1.8	Mar- May	Jul. Sept.	Aug.-Oct.	Dec. June
Cassava	1.0	Apr.-Jun	Sept.-Dec.		

Table 3. Cost and Return Analysis, Rice Production

A. VARIABLE COST:

Land Preparation

Plowing 10 MAD	₱ 250.00
1st harrowing 8 MAD	200.00
2nd Harrowing 6 MAD	150.00
Fixing dikes 6 MAD	90.00
Seedbed Preparation 2 MD	30.00
	<hr/>
SUB-TOTAL	₱ 720.00

Transplanting:

Pulling of seedling and transplanting 28 MD	₱ 420.00
	<hr/>
SUB-TOTAL	420.00
Weeding & sidedressing 18 MD	270.00
Fertilizer Application 4 MD	60.00
	<hr/>
SUB-TOTAL	₱ 330.00

B. INPUTS MATERIALS:

Fertilizers:

2 bags 16-20-0 at ₱ 121.50/bag	243.00
2 bags 14-14-14 at ₱113.90/bag	227.80
1 bag 46-0-0 at ₱129.00/bag	129.00
10 kilos Zinc Sulfate	80.00
	<hr/>
SUB-TOTAL	679.80
Pesticides (various kind)	300.00
Rodenticides	100.00
One (1) certified seeds at ₱95.00/cav.	100.00
	<hr/>
SUB-TOTAL	₱ 500.00

GRAND TOTAL	2,132.98
Production	2.0 tons
Value at ₱1.40/kg.	2,800.00
Net Return	667.02

Man-Animal Day at ₱25.00/day

Man-day at ₱ 12.50/day

Cost of corn seed at ₱2.50/kg.

Capital is based on labor, inputs, interest rate at 15. month

Corn production covers 6 months

TABLE 4. Cost and Return Analysis, Corn Production

A. VARIABLE COST:

<u>LAND PREPARATION</u>	<u>MAN-DAY</u>	<u>ANIMAL DAY</u>	<u>AMOUNT</u>
1st Plowing	7	7	175.00
2nd plowing	6	6	150.00
Harrowing (2x) 3	3	3	150.00
Furrowing	3	3	75.00
Planting, Fertilization(Basal)	7	-	87.50
Cultivation (2x) 3	3	3	150.00
Fertilizing (side dressing)	2	-	25.00
Spraying (2x) 3	3	-	37.50
Harvesting, husking and hauling	10	-	125.00
Shelling at ₱1.50/cav.			
Drying at ₱1.00/cav.	-	-	50.00
			Sub-Total ₱ 1,100.00

B. MATERIALS

Seeds 5 kg/ha.	₱ 37.50
Fertilizers:	
4 bags 14-14-14 or 16-20-0	420.00
1 bag 46-0-0	126.00
Pesticides and Fungicide	150.00
	₱ 733.50

C. FIXED COST:

Depreciation	₱ 40.00
Interest on capital	109.98
Rental charges	150.00
	₱ 299.98

C. FIXED COSTS:

Interest on Capital Investment, Computed at

1 percent in 6 months	₱	<u>158.34</u>
GRAND TOTAL	₱	2,808.14

D. PRODUCTION:

(Regular and palagad season at an average production of 70 cav./ha/
season with a support prize of ₱1.55/kilo.

Production - 2 x 70 x 50 x 1.55	10 ,850.00
Expenses: 2,808.14 x 2	<u>5,616.28</u>
Net Profit	₱ 5,233.72

TABLE 5. Cost and Return Analysis, Cassava Production

A. LABOR EXPENSES:

1. Land preparation 22 mad at ₱20.00/day	₱ 400.00
2. Planting and replanting 22 md at ₱12.50/day	175.00
3. Care of plants (weeding and crop protection 23 at at ₱ 12.50/day	287.50
4. Harvesting and hauling of tubers 20 md.	250.00
SUB-TOTAL	₱ 1,152.50

B. SUPPLIES AND INPUT MATERIALS:

1. Fertilizers (10 bags 14-14-14 at ₱113.00/bag)	1,130.00
2. Planting materials	200.00
SUB-TOTAL	₱ 1,330.00
	₱ 2,482.50

C. FIXED COST:

Return to Capital Investment is Computed by adding the
Labor Expenses plus the Cost of Input Materials and
Supplies multiplied by 1 percent per month of the duration
of loan (₱2,482.50 x 0.01 x 12 = ₱297.90

2,482.50

Total Expenses ₱2,780.40/ha.

Assumption:

Tuber production per hectare - 20 MT at ₱200/mt.....	₱ 4,000.00/ha.
Less expenses for 1 hectare cassava	2,780.40
Net Income per hectare ..	₱ 1,219.60

TABLE 6 - PRIORITY RESEARCH PROJECTS

A. Cereals

a) Basic

1. Fertilizer utilization
2. Trace element
3. Varietal study corn
4. Varietal study sorghum

b) Applied

1. Fertilizer utilization, rice
2. - " - corn
3. - " - sorghum
4. Compost trial
5. Fertilizer verification (rice)
6. Azolla
7. Pest & disease control, rice
8. - " - corn
9. - " - sorghum
10. Spacing & distancing
11. Multiple cropping, rice
12. - " - corn
13. Water management (rice)
14. Utilization/processing (corn)

B. Vegetables and Legumes

a) Basic

1. Varietal
2. Fertilizer Utilization & Nitrogen Fixation
3. Pests and Diseases Control
4. Pesticides Tolerance and Residues
5. Utilization/Processing

b) Applied

1. Adaptability
2. Fertilizer Verification & Trace Element
3. Pest and Disease Control
4. Organic Fertilizer
5. Relay Planting
6. Spacing/Distancing
7. Marketing
8. Utilization/Processing
9. Multiple Cropping

C. Fruits

a) Basic

1. Fertilization and Trace Element
2. Utilization/Processing

b) Applied

1. Pests and Disease Control
2. Intercropping
3. Pruning
4. Fertilizer Placement
5. Fertilization and Trace Element
6. Utilization/Processing

D. Beverages and Spices

a) Basic

1. Fertilization and Trace Element
2. Utilization/Processing

b) Applied

1. Fertilization and Trace Element
2. Utilization and Processing
3. Intercropping

E. Root Crops

a) Basic

1. Fertilization and Trace Element
2. Varietal Trial

b) Applied

1. Fertilization and Trace Elements
2. System
3. Spacing
4. Weed Control
5. Disease Control
6. Time of Planting
7. Varietal Trial

F. Soils

a) Basic

1. Trace Element, Calcareous Soils
2. Toxicity (Acid Soils)

b) Applied

1. Zinc
 - 1.1 Rice
 - 1.2 Corn
 - 1.3 Root Crops
2. Liming
 - 1.1 Corn
 - 1.2 Root Crops
 - 1.3 Sorghum
 - 1.4 Vegetables
3. Sulfur (Acidic Soils) - rice
4. Zinc (Rice)
5. Other trace elements (manganese, boron, etc.)
6. Vegetative and Mechanical Erosion Control
7. Siltation on Water Impounding
8. Water Management
 - 8.1 Rice
 - 8.2 Corn
 - 8.3 Legumes and Vegetables

9. Soil Improvement/Amendment/Conditioning
10. Organic Matter - Azolla, Compost and other plant residues

G. Livestock

a) Basic

1. Carabao (Water Buffalo)
 - a. Breeding
 - b. Feeding Management
2. Cattle
 - a. Deworming
 - b. Nutrition
 - c. Breeding
3. Goat
 - a. Breeding (Upgrading)
 - b. Nutrition

b) Applied

1. Nutrition
2. Feeding and Management
3. Pasture Improvement and Management
4. Breeding
5. Deworming

TABLE 7.. Research program, budgetary requirement

Commodity	No. of Studies	(in pesos)					Total
		1	2	3	4	5	
1. Crops							
1.1 Cereals	18	154,450	237,400	261,100	196,160	58,740	907,850
1.2 Vegetables & Legumes	14	164,100	178,300	25,700	-	-	368,100
1.3 Plantation Crops	13	173,650	188,200	207,000	227,600	250,300	1,046,750
1.4 Root crops	9	104,100	114,500	125,900	104,300	59,200	508,000
2. Soils	19	567,094	371,729	408,891	451,641	496,794	2,296,150
3. Livestock	12	231,600	224,800	70,300	49,900	54,900	631,500
TOTAL	85	1,394,994	1,314,929	1,098,891	1,029,601	919,934	5,758,350

TABLE 8. - TRAINING PROGRAM

AR COURSE TITLE	Duration (Days)	Frequency (per year)	Target Trainee	No. of Trainee	No. of Instructor	Budgetary Requirements (in pesos)
Refresher course on extension education	4	2	DAO/MAO	57	5	24,800
Subject matter specialist Orientation training & seminar	5	2	SMS/DAO	17	6	11,500
Leadership and social technology training	4	2	MS/DAO/MAO	65	4	27,600
Refresher course on recent advancement on rice production and extension	5	6	M-99 technicians	30	4	51,000
Refresher course in livestock production	5	2	DAO/MAO technicians	50	4	27,000
Basis concepts in soil fertility	4	2	MAO technicians	50	4	21,600
SUB-TOTAL						163,500
Project Management Seminar	4	2	SMS/DAO/MAO	65	4	27,600
Recent advancement on corn production and extension	5	6	Maisan technician	30	4	51,000
Establishment/conducting applied research and demo. projects	4	2	MAO/DAO	57	3	24,000
Seminar-workshop on effective communication	3	2	DAO/MAO	57	3	18,000
Farm planning & budgeting	2	2	MAO technician	50	3	10,600
Plant propagation & distribution	4	6	Farmer leaders	50	3	63,600
SUB-TOTAL						194,800

Azolla culture/ utilization	3	6	Farmer leader	50	3	47,700
Seed productio, uti- lization and distri- bution	4	6	Farmer leaders	50	3	63,600
Cassava and rootcrop production	3	6	Farmer leaders	50	4	48,600
Plantation crops pro- duction	4	6	MAO/ technicians	50	5	66,000
Cattle and goat fattening	4	6	Farmer leader	50	4	64,800
Harvest & post harvest operation	3	6	Farmer leader	50	4	48,600
SUB-TOTAL						339,300
Compost making & utilization	3	6	Farmer leader	50	3	47,700
Farm marketing & financing	3	6	MAO technician	50	3	47,700
Vegetable production	3	6	Farmer leaders	50	3	47,700
Pest & diseases of major crops and their control	3	6	MAO/ technician	50	4	48,600
Cooperative development	5	6	DAO/MAO	50	3	49,500
SUB-TOTAL						334,800
Multiple cropping & upland crops	2	6	Farmer leaders	50	3	31,800
Pest & diseases of livestock and their control	3	6	MAO/ technicians	50	3	47,700
Pasture management devt.	3	6	Farmer	50	3	47,700
Soil conservation & water management	3	6	Farmer leaders	50	3	47,700
Legume production and utilization	4	6	MAO/ technicians	50	4	64,800
Storing/Processing on farm products	4	6	MAO/ technician	50	3	63,600
SUB-TOTAL						303,300
GRAND TOTAL						1 337 700

FIGURE I
EXTERNAL LINKAGES OF THE
AGRICULTURAL PROMOTION COMPLEX IN BOHOL

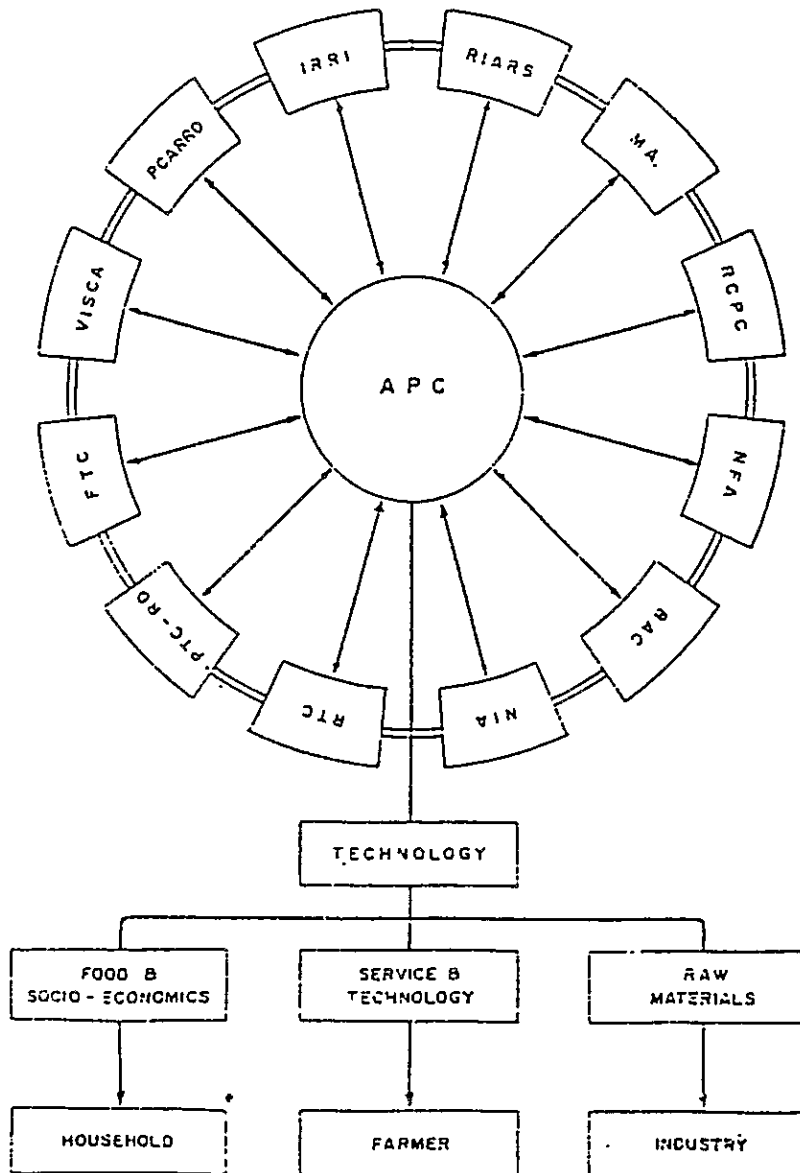


FIGURE 2
 AGRICULTURAL PROMOTION COMPLEX
 ORGANIZATIONAL SET-UP

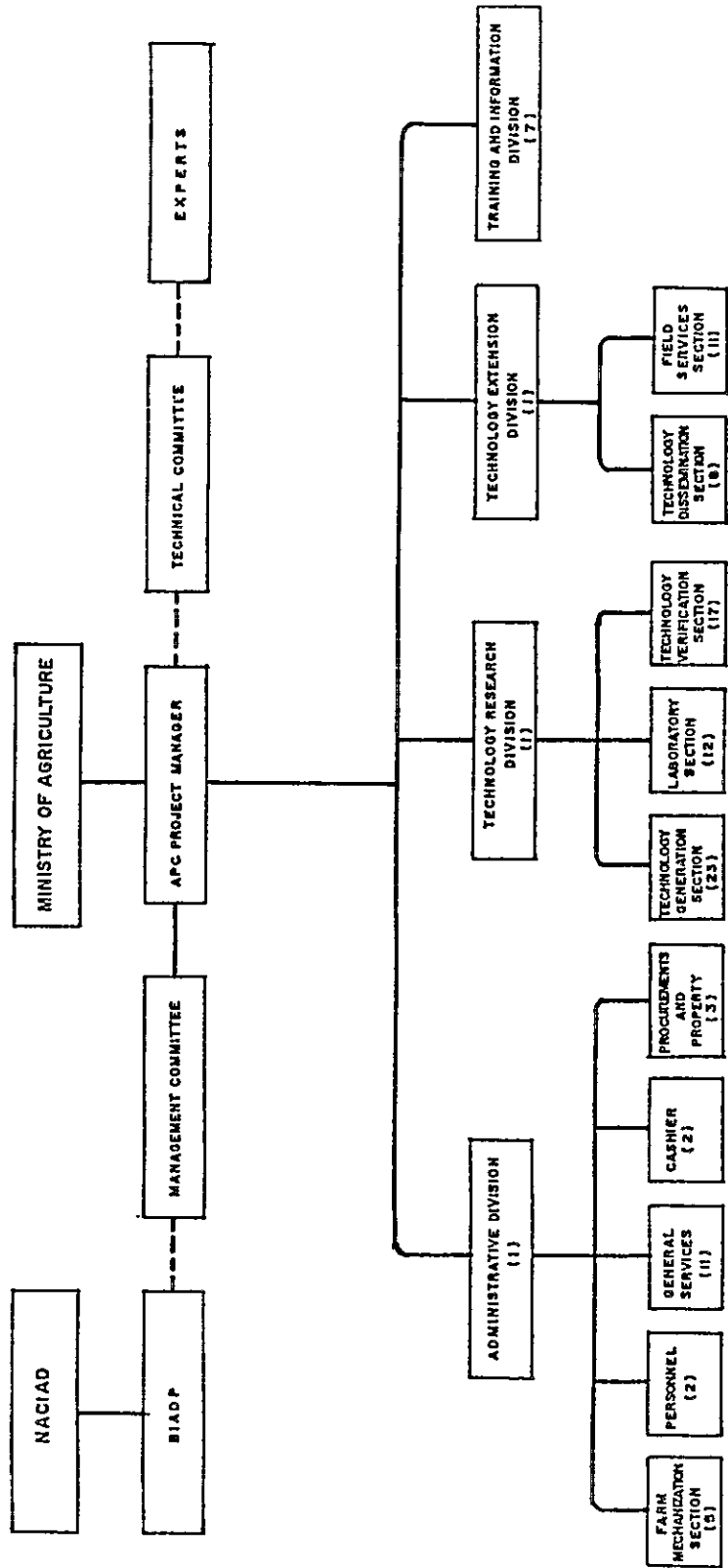


TABLE 9, Budgetary Requirement, Farm Demonstration

	YEAR					TOTAL
	Y1	Y2	Y3	Y4	Y5	
Rice						
a. Fertilizer & Zinc Application	10,286	20,190	40,381	50,476	60,571	181,714
b. Varietal Adaptability	6,057	10,095	20,190	30,280	40,381	107,010
c. Effectivity of New Pesticides & Spacing	2,019	4,038	10,095	14,133	20,190	50,476
SUB-TOTAL	18,362	34,323	70,666	94,895	121,142	339,200
Corn						
a. Fertilizer & Lime Application	5,866	11,732	17,598	23,464	29,330	87,990
b. Varietal Adaptability	2,933	5,866	14,665	20,531	29,330	73,325
c. Effectivity of New Pesticide	2,933	2,933	8,799	14,665	23,464	52,794
SUB-TOTAL	11,732	20,531	41,062	58,660	82,124	214,109
Cassava						
a. Fertilizer Rate	4,735	9,470	18,940	28,410	37,880	99,435
b. Varietal Adaptability	4,735	9,470	18,940	28,410	37,880	99,435
SUB-TOTAL	9,470	18,940	37,880	56,820	75,760	198,870
Multiple Cropping						
a. Rice-based	13,056	13,056	26,112	39,168	53,224	143,770
b. Corn-based	13,151	13,151	26,302	39,453	52,604	144,662
c. Coconut-based	9,753	9,753	19,506	29,260	39,013	107,266
SUB-TOTAL	35,960	35,960	71,920	107,881	144,841	395,718
GRAND TOTAL	75,524	109,754	221,528	318,256	423,867	1,147,897

TABLE 10. Total Budgetary Requirement

	YEAR					TOTAL
	1	2	3	4	5	
(In pesos)						
1. Research	1,394,994	1,314,929	1,098,891	1,029,601	919,934	5,758,350
2. Training	163,500	194,800	339,300	334,800	303,300	133,700
3. Farm Demonstration	75,524	109,754	221,528	318,256	423,867	1,147,897
T O T A L	1,634,018	1,619,483	1,659,719	1,682,657	1,647,101	7,039,947

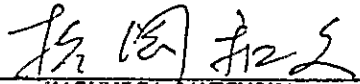
MINUTES OF DISCUSSION
ON
THE ESTABLISHMENT OF AGRICULTURAL PROMOTION COMPLEX
IN
THE REPUBLIC OF THE PHILIPPINES


At the request of the Government of the Republic of the Philippines (GOP) for a grant capital aid in establishing the Agricultural Promotion Complex (APC) in Bohol, the Government of Japan (GOJ) has sent a Mission to carry out the Basic Design Study (the Study) on the APC Project (the Project) from 28th September to 14th October 1982.

The Mission has carried out field survey and held a series of discussions with the National Council on Integrated Area Development (NACIAD) under the Office of Prime Minister, Ministry of Agriculture, Ministry of Public Works and Highways and concerned authorities of the GOP.

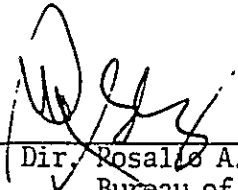
As a result of these surveys and discussions, JICA prepared and submitted a Draft Final Report on the Study and dispatched a Mission to explain and discuss on this Report from 24th to 29th January 1983. Both parties had a series of discussion on the Report and have agreed to recommend to their respective Governments and authorities concerned to examine the major points of understanding reached between them, attached herewith, toward the realization of the Project. ♦


28 January 1983
Manila


KAZUHISA MATSUOKA
Leader of the JICA Mission


REYNALDO E. DE SAGUN
Project Director, Bohol Integrated Area
Development Project (NACIAD)

WITNESSES :


Dir. Rosalio A. Mallonga
Bureau of Design
Ministry of Public Works and
Highways


Dr. Edgardo C. Quisumbing
Agriculture Research Office
Ministry of Agriculture

MAJOR POINTS OF UNDERSTANDING

Basic Design

1. Philippine side has agreed with the basic design proposed in the Draft Final Report.
2. Philippine side requested that, as they intend to install radio communication equipment by themselves, a small room for radio communication should be included in the Research and Training Building of the Main Center. Japanese side has accepted their request.
3. Philippine side has proposed the following changes which the Japanese side has accepted and such changes will be made in the final report:
 - a) Orientation of the Sports Ground in the Main Center from the North-South direction to the East-West direction.
 - b) Change on the Design Conditions for Airconditioning system for outdoor design from 34°C and the indoor design from $27 \pm 2^\circ\text{C}$ to $23.8 \pm 2^\circ\text{C}$.
 - c) Provision of an underground reservoir where water should be pumped to the elevated water tank instead of directly pumping the water from the city water main to the elevated water tank.
 - d) Change in the rating of the Power Receiving Substation and Generated from the 3-phase, 4-wire, 380 V/220V to 3-phase, 3-wire, 240V.
 - e) Change in the grade of the Power Load from 3-phase, 3 wire, 380 V to 3-phase, 3 wire, 220 volts and that of the Lighting Receptacle Load from 3-phase, 3-wire, 380 V/220 V to 1-phase, 2-wire, 220V.

4. Philippine side should submit the topographic map of Ubay livestock subcenter at a scale of 1:500 by the end of February 1983.
5. Philippine side should submit the Master Plan including the buildings infrastructure and other facilities and the description of the activities in Ubay Research Complex by the end of February 1983.
6. Japanese side should submit the final report within one month after receipt of items. 3 and 4.

GOJ's Contribution Requested by the GOP

7. Philippine side requested the following facilities would be included in the Japanese grant aid except outside facilities:
 - a) Main Center
 1. Research and Training Building
 2. Canteen
 3. Office of Field Trials
 4. Dormitory and Liaison Office
 5. Expert's House (four houses)
 6. Green House (one lath-house)
 7. Covered way
 8. Elevated Water Tank
 - b) Rice Research Sub-Center
 1. Rice Research Building
 2. Liaison House
 - c) Livestock Research Sub-Center
 1. Livestock Research Building

NACIAD

NATIONAL COUNCIL ON
INTEGRATED AREA DEVELOPMENT
FBI BLDG, 60 TIMOG AVENUE
QUEZON CITY
TEL NO 95-26-83 • 97-85-21 to 24

30 October 1982

Mr. Toshikazu Miura
Japan International Cooperation Agency
Makati, Metro Manila

Dear Mr. Miura:

We are submitting herewith additional information requested by the Basic Design Study Mission on the Bohol Agricultural Promotion Complex as for the Minutes of Discussion. These include the following:

1. Final site of the rice research sub-center:


The Bohol Integrated Area Development Project coordinated with key official from the Ministry of Agriculture and a final decision was made that the site of the sub-center will be at the Bohol Experiment Station in Ubay, Bohol. Attached herewith is a copy of the letter by the Regional Director of MA.

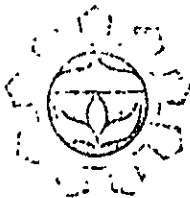
2. Budgetary Requirement of the Agricultural Promotion Complex (APC):

Attached herewith is the estimated overhead costs of the APC. These costs include salaries/wages, travelling, supplies and materials and miscellaneous costs. These costs are in addition to the operating costs (research, training and extension functions of the APC) reflected in the revised operational plan.

We are looking forward to favorable action on our request for assistance in the Japan Grant-In-Aid.

Very truly yours,


REYNALDO E. DE SAGUN
Project Director, Bohol Integrated Area
Development Project



Republic of the Philippines
MINISTRY OF AGRICULTURE
Region VII, Cebu City

October 25, 1962

Mr. Reynaldo de Sagun
Project Director, M.C.I.A.B.
20 Timog Avenue, Quezon City

Dear Mr. de Sagun,

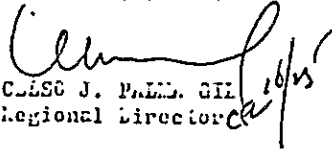
The Management and Staff of the Ministry of Agriculture, Region VII have discussed thoroughly the specific location of the satellite center of the Agricultural Promotion Complex in Bohol particularly for Ubay. In our discussion, we have decided to abide with the original plan which is at the Bohol Experiment Station, Gabi, Ubay, Bohol.

Considering the potential of livestock production in the region, we are proposing additional funding for buildings and facilities to support our livestock research at the Ubay Stock Farm.

In this connection, therefore, may we request you to consider these changes in preparing your final plans. We will be sending you a detail plan of the activities and requirements of the livestock research at Ubay Stock Farm for your perusal.

Thank you and regards.

Very truly yours,


CELSC J. PALMA GIL
Regional Director

Itemization of Personal Services
for Bchol APC

OFFICE/STAFF	Nature of Appointment	Salary	M O N T H L Y		Annual Requirement
			Allowance/ Honorarium	Total	
1.0 OFFICE OF PROJECT MANAGER (5)					
1. Project Manager	on detail	-	1,000	1,000	12,000
2. Secretary	direct hired	850	200	1,050	12,600
3. Clerk/Typist	"	800	200	1,000	12,000
4. Messenger	"	650	200	850	10,200
5. Driver	"	850	200	1,050	12,600
		<u>3,150</u>	<u>1,900</u>		<u>59,400</u>
2.0 ADMINISTRATIVE DIVISION (20)					
1. Administrative Officer	direct hired	1,250	200	1,450	17,400
2. Personnel Officer	"	1,100	200	1,300	15,600
3. Agric. Engr.	"	1,100	200	1,300	15,600
4. Cashier	"	1,000	200	1,200	14,400
5. Canvassers (4)	"	2,400	800	3,200	38,400
6. Mechanic	"	750	200	950	11,400
7. Storekeeper (2)	"	1,800	400	2,200	26,400
8. Clerk/Typist (5)	"	4,000	1,000	5,000	60,000
9. Driver (2)	"	1,700	400	2,100	25,200
10. Utility men (2)	"	1,150	400	1,550	18,720
		<u>16,260</u>	<u>4,000</u>		<u>243,120</u>

ESTIMATED BUDGETARY REQUIREMENT
BOHOL AGRICULTURAL PROMOTION COMPLEX

ITEM	1	2	3	4	5	T O T A L
	(in Pesos)					
1.0 Administrative/ Overhead Costs						
1.1 Salaries	652,920	750,858	863,487	993,010	1,142,960	= ₱ 4,403,235.00
1.2 Allowances/ Honorarium	415,200	415,200	415,200	415,200	415,200	= 2,076,000.00
Sub-Total	= 1,068,120	= 1,166,058	= 1,278,687	= 1,408,210	= 1,558,160	= 6,479,235.00
2.0 Operating Costs						
2.1 Research	1,394,994	1,314,929	1,098,891	1,029,601	919,934	= ₱ 5,758,349.00
2.2 Training	163,500	194,800	339,300	334,800	303,300	= 1,335,700.00
2.3 Farm Demon- stration	75,524	109,754	221,528	318,256	423,867	= 1,148,929.00
Sub-Total	= 1,634,018	= 1,619,483	= 1,659,719	= 1,682,657	= 1,647,101	= 8,242,978.00
3.0 TOTAL	= 2,702,138	= 2,785,541	= 2,938,406	= 3,090,867	= 3,205,261	= ₱ 14,722,213.00

NACIAD

NATIONAL COUNCIL ON
INTEGRATED AREA DEVELOPMENT
FBI BLDG., 60 TIMOG AVENUE
QUEZON CITY
TEL. NO. 95-26 83 • 97-85-21 to 24

21 December 1982

Mr. Kazuhisa Matsuoka
Team Leader, Bohol APC Basic Design Mission
JICA, Tokyo, Japan

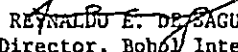
THRU: JICA Office
Makati, Metro Manila

Dear Mr. Matsuoka:

We are formally transmitting herewith the content of activities of the proposed livestock sub-center at the Ubay Stock Farm as proposed by the Philippine side. It is to be noted however, that an advanced copy of this was already forwarded to the KUME Architects in early November 1982.

We are eager to meet and discuss with you the first draft of the Mission's report. Regards and Merry Christmas and Happy New Year.

Very truly yours,


REYNALDO E. DE SAGUN
Project Director, Bohol Integrated Area
Development Project

Attached: Content of Activities,
Livestock Research Sub-Center



Proposed FACILITIES: (77001)

A. Research Building with the following:

A-1 Laboratory equipped with:

- 1) Autoclave
- 2) Refrigerator
- 3) Analytical Balance
- 4) Microscopes
- 5) Babcock
- 6) Glass wares
- 7) Reagents
- 8) Autopsy set
- 9) Centrifuge
- 10) Assorted accessories

A-2 Office:

- 1) Filing Cabinet
- 2) Furniture
- 3) Typewriter
- 4) Shelves
- 5) Adding Machines
- 6) Supplies

A-3 Store Room:

A-4 Garage

A-5 Personnel Bunkhouse

B. WATER SYSTEM:

1. Concrete water tank 10,000 gal. cap.
2. booster pump
3. assorted accessories

C. ELECTRICAL SYSTEM:

1. Generator 5 HP (Diesel)
2. Assorted accessories

D. TRACTORS - Heavy Equipments:

1. Ten ton pick-up (1)
2. Motorcycles (2)
3. Jeep (1)
4. Tractor 50 hp (1) with accessories
5. Tractors (2)
6. Assorted farm tools

II. STAFFING:

Research Coordinator	1
Research Veterinarian	2
Senior Researcher	2
Research Assistant	2
Statistician	1
Research Aide	2
Laboratory Aide	2
Clerk	3
Driver	3
Mechanic	1
Labourer	6

II. Research Programs:

1. Effects of varying energy levels on the performance of lactating Murrah buffaloes at Ubay Stock Farm.
2. Development of effective extension strategies on Dairy Production in Echol.
3. The productive and reproductive performance of purebred Carabadian and Murrah Buffaloes and their respective crosses.
4. Pilot study on the establishment of a dairy goat farm under Ubay conditions.
5. Breeding and improvement of native goats for dairy production in Echol.
6. Carabeef production in native and native ipil-ipil - pasture at different stocking rates
7. Productivity of guinea grass/stylo mixed pasture at different stocking rates.

III. Training Program:

1. A.I. and Pregnancy Diagnosis for cattle/carabao.
2. Cow hands - training.
3. On the job training for ranch management.
4. Feedgrain and pasture development training.
5. Field practice courses for graduating agricultural students.

Estimated Budgetary Requirements:

Research	--	1,515,000.00
Salaries	--	256,600.00
M.C.D.	--	<u>500,000.00</u>
TOTAL	--	2,271,600.00

TITLE : Development of effective extension strategies in dairy production.

SIGNIFICANT:

Local dairy production is largely influenced by the acceptance of the product within a given locality.

And although the value of dairy products in terms of improving health and increasing income is generally recognized, the dairy industry has yet to experience a boom.

Envisioned as a major objective under the government's Livestock Development Program is the goal of the accelerating milk production by infusing imported bloodlines into our existing indigenous herds.

To be able to accomplish this, the development program should be able to reach out and involve larger number of farmers and consumers.

The producers should be able to acquire and practice improved technologies to increase productivity and the consumers should be educated and enlightened on the advantage of dairy products to increase consumption. Establishing these two areas would mean a certain stability for the Dairy Industry and a guaranteed improvement in the health status of the populace in the nation.

METHODS:

A preliminary survey of the farmers in the region engaged in dairy production will be made to determine and evaluate the motivating factors responsible for influencing these farmers of going into dairy production. Existing management practice will be considered to assess productivity:

Based on this information, 2 adjacent barangays will be selected and ten farmers from each of these barangays will be considered as farmer cooperators. These farmers will be required to undergo special three-day training by the DAI regional staff relative to various aspects of dairy goat production including artificial insemination.

Animals, relevant data and production technology obtained in the current Region 7 checker research and development program will be used in this study. The ten farmers in each barangay will be divided into two groups A & B. Group A farmers will each be given 5 native does of breeding age while group B-farmers will receive 5 grade does each. Two native does will be assigned to each to Group-A farmers on a rotational basis while A will be used on grade does of Group-B farmers. One research aide will be assigned to each group of farmers to closely coordinate and

and supervise feeding and management, while feeds will be required to be provided by the farmer cooperators. Milk produced will be collected, processed and sold by the BAI milk center to be established in U Stock Farm. Farmers will be required to return one doe of the breeding age to BAI as payment of the original doe received before they will allowed ownership of the original doe and each off-springs. The does received from the farmers will be used for the expansion of the envisioned dairy goat production and development program the barangay way.

The project will be carried for four lactations for purposes of gathering needed data. After which a cost/benefit ratio analysis will be made including the effect of the project operation on the well-being of the farmers and their families.

DURATION : 36 months

TOTAL PROJECT COST: P229,425.00

TITLE: The productive and reproductive performance of purebred Cambodian and Murrah buffaloes and their respective crosses.

SIGNIFICANCE:

The Carabao is one of the animal resources in the Philippines currently enjoying government support. Our native animal is definitely uneconomical when it comes to meat and milk production. To correct this, the government has been importing better breeds of buffaloes in an effort to improve the milk and meat productivity of our local specie. It is therefore imperative to evaluate the genetic contributions of these imports and quantify the economic benefits derived from these breeds, to re-align objectives, strengthen strong points and convert whatever weak points.

OBJECTIVES:

- To evaluate the productive and reproductive performance of two imported purebred buffaloes and their crosses.
- To determine the economic significance of the crosses produced in comparison to the improved animal.
- To determine which of the different crosses performs best within the area.

METHODOLOGY:

The study will be mainly concerned in recording data pertinent to production and reproduction of purebred Cambodian and Murrah buffaloes and their respective crosses. The purebred herds are already existing, while crossbreds for Murrah x Cambodian, Murrah x Native, Cambodian x Native will have to be established. The study will consist of 7 herds representing 7 trials with a minimum herd population of 15 females and 1 male. The whole project will be composed of two distinct phases. Phase one will deal mainly with the purebred herds and Phase II with the respective crosses. All in all a period of six (6) years.

TOTAL PROJECT COST : ₱ 137,400.00

TITLE: Pilot study on the establishment of a dairy goat farm under Ubay conditions.

SIGNIFICANCE:

Goat production is popular among farmers in Central Visayas. However, the potential of goats for milk-chevon production have not effectively tapped due to lack of efficient management system and market outlet to ensure the economic viability of a goat farming venture.

The proposed project is designed to demonstrate the profitability of dairy goat raising in order to encourage substantial production output through the participation of a greater number of the farming populace.

With this expected output, farmers can integrate their goat production project with their respective cropping systems thereby maximizing their farm income.

OBJECTIVES:

1. To identify production parameters on dairy goat production of pure grades and grades under Ubay condition.
2. To develop appropriate feeding and management scheme, suitable for milk-chevon production this particular environment.
3. To determine the economic and commercial potential of goat dairying as a basis for the region wide adoption of this farming system.

SUMMARY/PROCEDURE/METHODS:

Sixty (60) selected native does 10-12 months old will be procured to form the foundation stock. This will be equally divided into two separate herds, i.e. Herd A & B. Two each of selected native and purebred bucks will be purchased and assigned to herds A. & B respectively. The native bucks will be used to produce the native does and the purebred bucks to produce the grades. After a year 25 each of the F_1 native does and carabaos will be selected and treated separately as the experimental lots I & II respectively. One of the native bucks will be used for lot I while one of the purebred bucks on lot II. All animals in the experimental lots will receive identical feeding and management. A three hectare-legume grass forage area will be maintained and this will be used on a cut-and-carry basis. Whenever feasible, farm crop residues will be used as part of the roughage ration. Concentrate supplement will be given at minimal level depending on the volume of milk produced.

The performance of the two experimental lots will be compared relative to the following:

1. Production/reproduction:
 - a. Average lactation period
 - b. Average kidding interval
 - c. Average milk yield per day/lactation in kg.
 - d. Average number of kids per kidding
 - e. Average frequency of kidding per year.
 - f. Total-milk production in a herd basis
 - g. Average kidding ratio/kid crop

2. Growth performance
 - a. Average daily gain in weight of kids
 - b. Average dressing percentage
 - c. Average carcass weight.

3. Health
 - a. Resistance to diseases and parasites
 - b. General health condition of the herd
 - c.

4. Cost benefit-ratio analysis

Data gathered will be organized for proper statistical treatment and analysis.

DURATION: 54 months

TOTAL PROJECT COST: P297,298.00

TITLE: Breeding and Improvement of native goats for dairy production in Bohol.

IMPORTANCE: The native goat is a low milk producer. Upgrading these natives with established dairy goat breeds would improve the milk production of our native goats. Increasing the milk production potential of our native does would indirectly influence the nutrition campaign being conducted by the government.

OBJECTIVES:

1. To compare milk production among grade does of Anglo-Nubian and Saanen as basis for future upgrading program.
2. To compare growth rates, reproductive performance and feed conversion status of the different grades.
3. To determine the relative tolerance of these grades to local diseases and parasites in the specific areas.

METHODOLOGY:

Forty selected native does will be bred to purebred Anglo-Nubian and Saanen Bucks to provide the F_1 & F_2 . All animals will be given identical feeding and management and the performance of the first and second generation offsprings in terms of milk prod., feed conversion, rate of growth, adaptability and other relevant production parameter will be recorded.

Male grades will be utilized in a Feedlot Fattening Scheme to determine growth rate, F.E. and average carcass weight.

Data collected will be treated with appropriate statistical analysis for comparative significance. The grade produced which has highest production average will be recommended for mass reproduction.

DURATION : 4 years

TOTAL BUDGETARY REQUIREMENTS:

YEAR I - 4 P 174,255.00

NACIAD

NATIONAL COUNCIL ON
INTEGRATED AREA DEVELOPMENT
FBI BLDG., 60 TIMOG AVENUE
QUEZON CITY
TEL NO 95-26-83 • 97 85-21 to 24

2 March 1983

Mr. Yoshikazu Matsuura
First Secretary
Embassy of Japan
Makati, Metro Manila


Dear Mr. Matsuura:

In connection with the Minutes of Discussion between the Bohol Integrated Area Development Project and the Japan Grant Aid Mission last January 28, 1983, we are submitting herewith the following documents for transmittal to Japan:

1. Topographic map of proposed site at the Ubay Stock Farm (1:500)
2. Description of activities of the Bohol Experiment Station
3. Master Plan of proposed buildings and other facilities at the Bohol Experiment Station.

We are looking forward to your usual support and assistance to the Project.

Very truly yours,


REYNALDO E. DE SAGUN
Project Director, Bohol Integrated Area
Development Project



BOEOL EXPERIMENT STATION
GABI, UBAY, BOEOL

A. Description of the Activities of the Station

The station conducts basic and applied researches in cereals, legumes, rootcrops, fruit trees and cropping systems. Presently, the scope of crop research emphasizes on the applied, however, a number of the on-going researches are on the technology generation level. Technology verification trials right at the farm levels have been started lately and shall be vigorously pursued by the end of the first quarter 1983 with the funds generated from the RIARS program. Cropping pattern trials and component technology testing shall be done in the farmers fields, along with some verification trials on the station. The thrust on farming systems will eventually dominate the activities of the station in addition to the other related studies.

On the production aspect, the station's major activities center on the production of Registered and Certified Seeds of Rice, Corn, Sorghum, Legumes and some Vegetables to fill the needs of farmers in the vicinity, province and other non-seed producing stations. Assorted planting materials are produced sexually and asexually for sale and distribution. Melon production for seed purposes is being undertaken presently. A portion of the area is planted to "hanga" or "petro tree" and the necessary cultural operations and management are being attended to. Likewise, crop protection activities are being undertaken in addition to monitoring the climatological data day to day together with insect pest and disease surveillance.

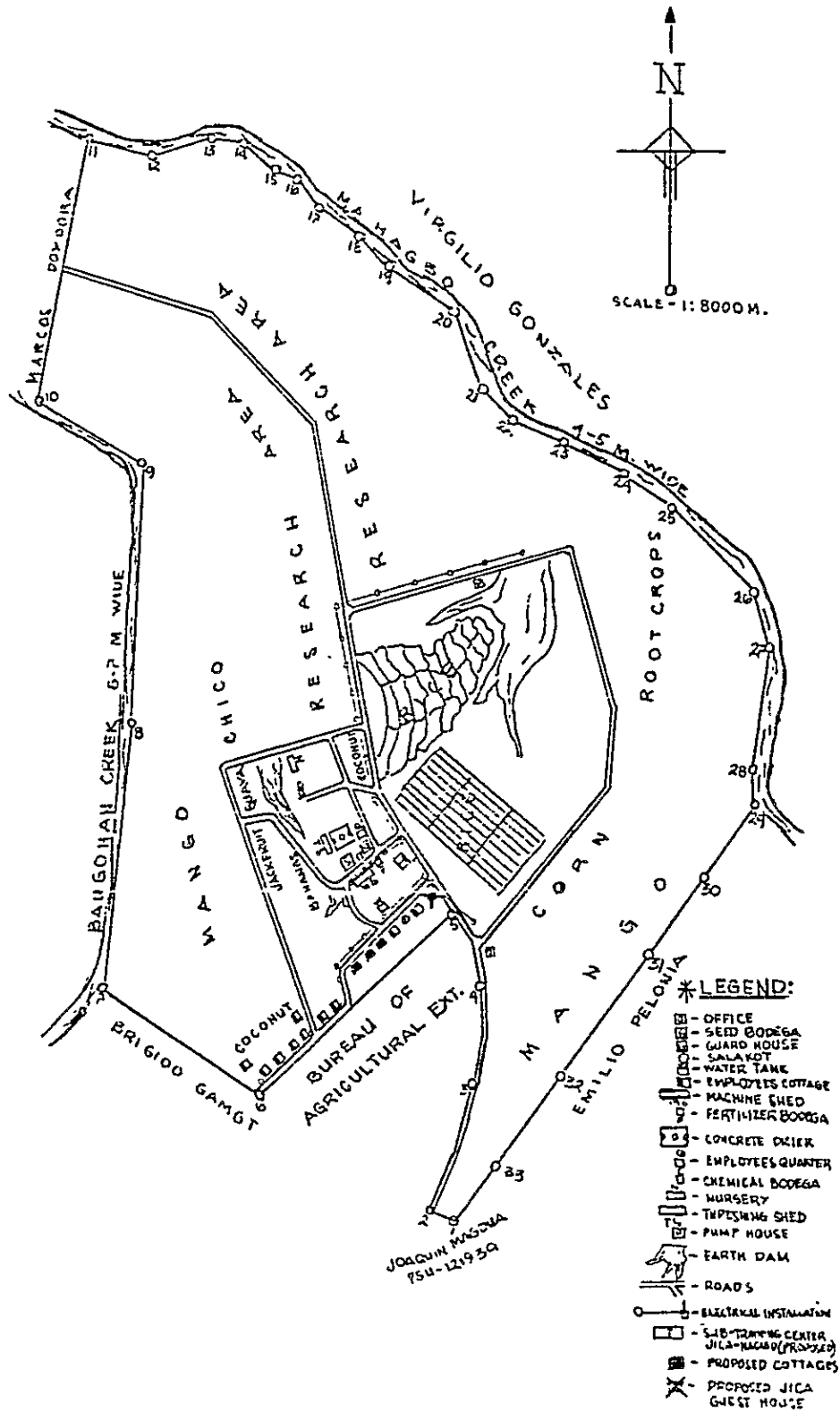
B. The Proposed Buildings

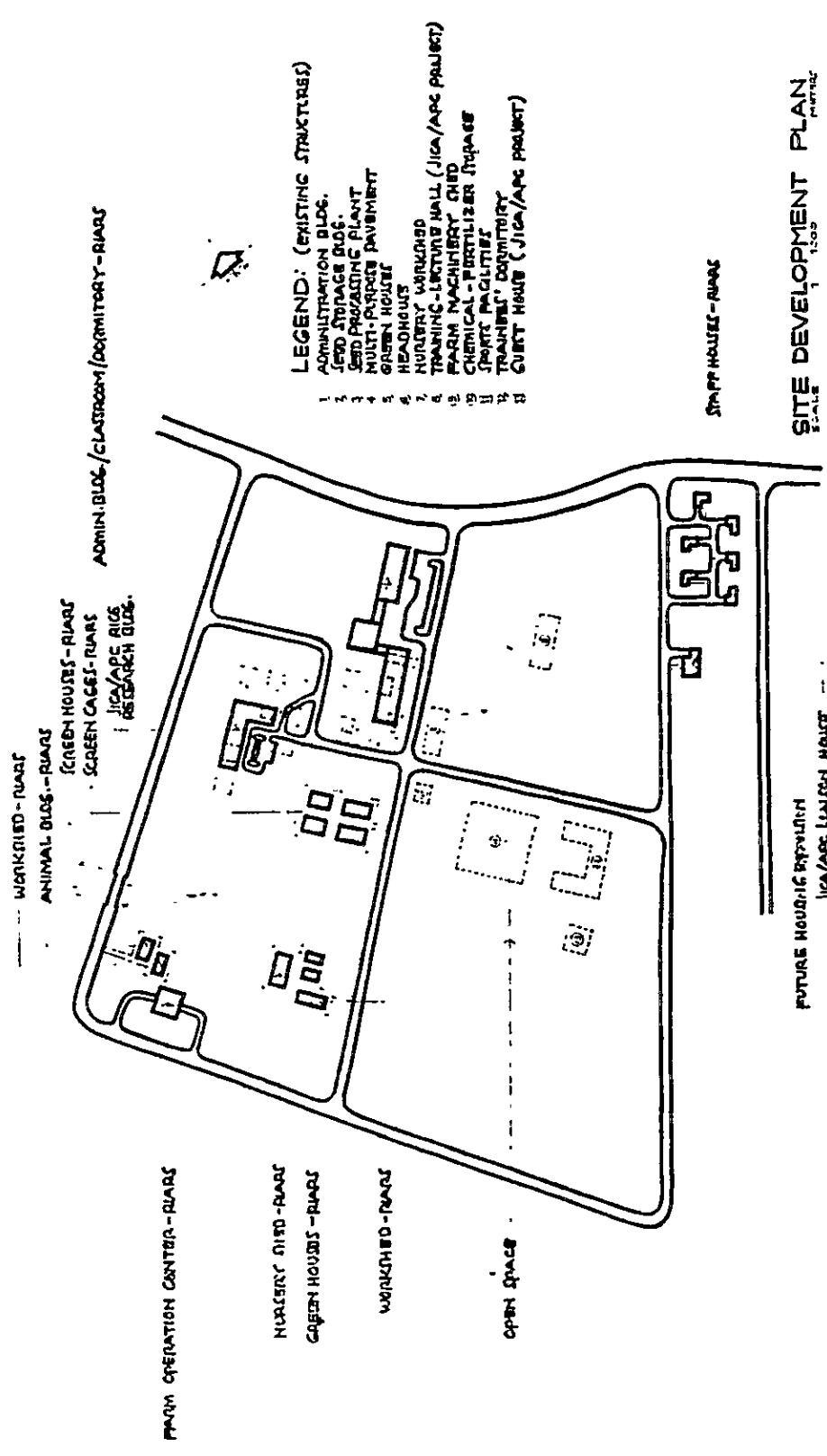
1) Sub-Research/Training Center and Dormitory

This building will serve as the nucleus of research activities in the station. Important research undertaking and consultative meetings shall be held in the center. Laboratory facilities and paraphernalia shall be housed in this building and more importantly, scientific gatherings, periodic and regular conference, trainings, seminar workshops and the like shall be held in the center. It can likewise serve as office for the personnel manning the project and some station personnel. The built-in dormitory within the sub-training center, shall accommodate guests and other participants of whatever meetings/trainings are undertaken.

2) JICA Guest House

This building will be exclusively used by JICA-NACIAD executives, Very Important Persons (VIPs) from the National Offices and the Ministry. It will be well-facilitated with adequate water, light and ventilation for the comfort of the prospective occupants.

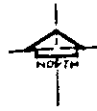














- LEGEND: (EXISTING STRUCTURES)**
- 1 ADMINISTRATION BLDG.
 - 2 SEED STORAGE BLDG.
 - 3 SEED PROCESSING PLANT
 - 4 MULTI-PURPOSE PAVEMENT
 - 5 GREEN HOUSE
 - 6 HEADHOUSE
 - 7 NURSERY WORKSHOP
 - 8 TRAINING-LECTURE HALL (JICA/APE PROJECT)
 - 9 FARM MACHINERY CHED
 - 10 CHEMICAL-FERTILIZER STORAGE
 - 11 STORES FACILITIES
 - 12 TRAINERS' DORMITORY
 - 13 GUEST HOUSE (JICA/APE PROJECT)

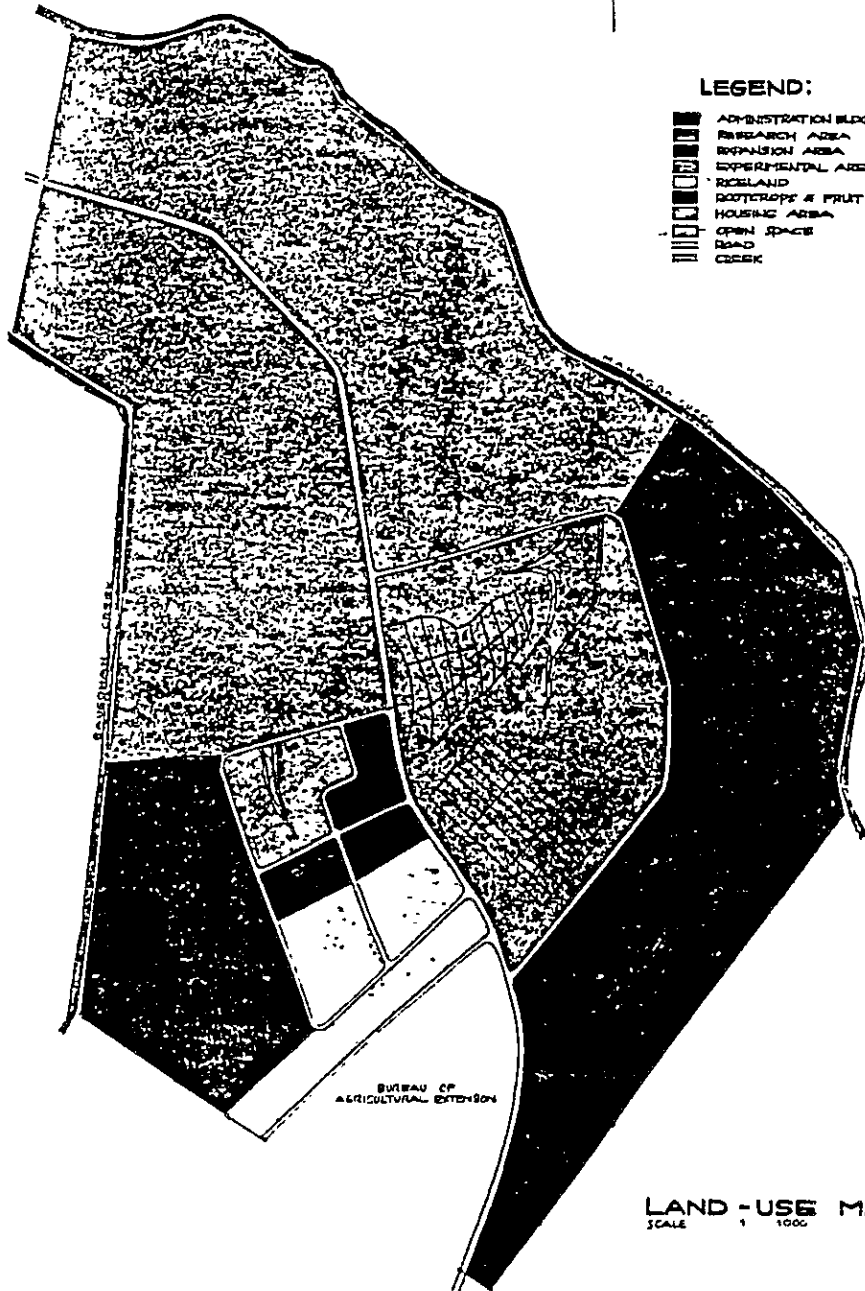
SITE DEVELOPMENT PLAN
SCALE 1:1,000

REGIONAL INTEGRATED AGRICULTURAL RESEARCH STATION
 UDAY



LEGEND:

-  ADMINISTRATION BLDG., CLASSROOMS, DORMITORY
-  RESEARCH AREA
-  EXPANSION AREA
-  EXPERIMENTAL AREA
-  RICELAND
-  ROTOCROP & FRUIT TREES
-  HOUSING AREA
-  OPEN SPACE
-  ROAD
-  CREEK












BUREAU OF
AGRICULTURAL EXTENSION

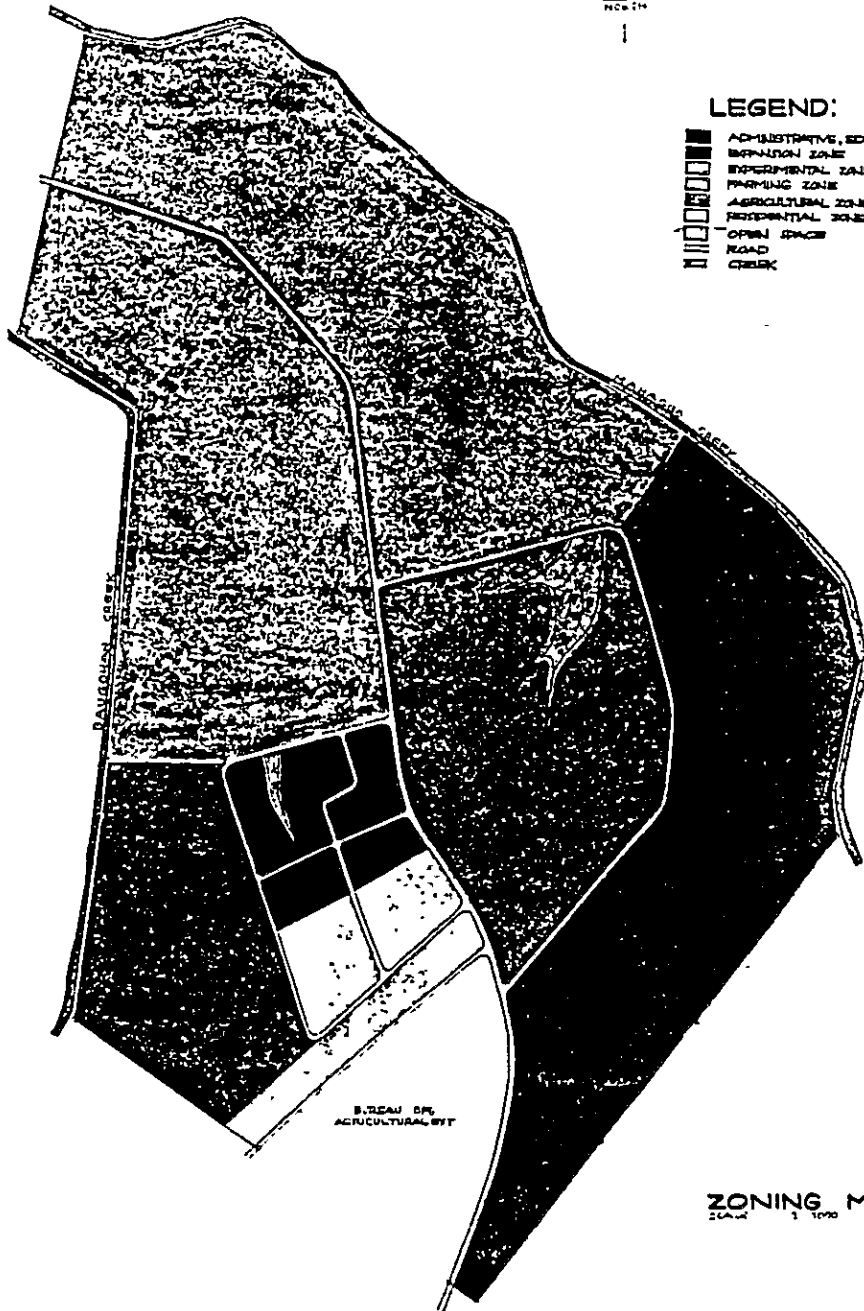
LAND-USE MAP
SCALE 1" = 1000'

REGIONAL INTEGRATED AGRICULTURAL RESEARCH STATION
USAT 60492L



LEGEND:

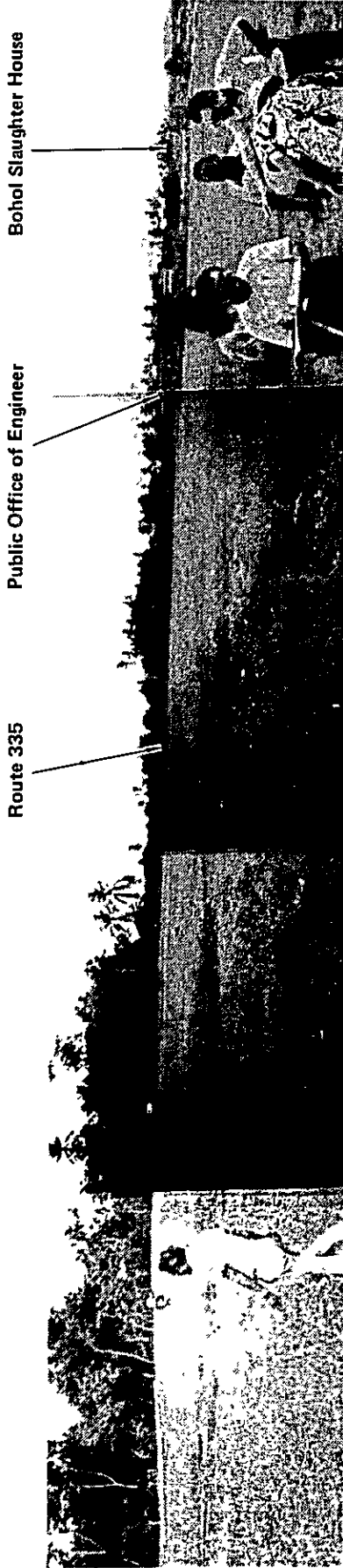
-  ADMINISTRATIVE, EDUCATIONAL & RESEARCH ZONE
-  IMPLANION ZONE
-  EXPERIMENTAL ZONE
-  PARKING ZONE
-  AGRICULTURAL ZONE
-  RESIDENTIAL ZONE
-  OPEN SPACE
-  ROAD
-  CREEK



REGIONAL INTEGRATED AGRICULTURAL RESEARCH STATION
UBAT R445L

4. Project Site

A) Main Center (Dao)

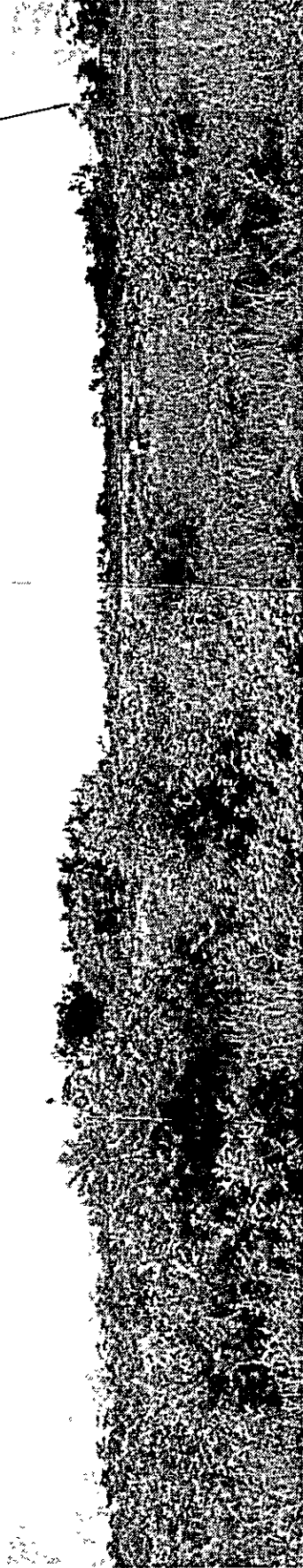


Seeing East-south from Center of the Site



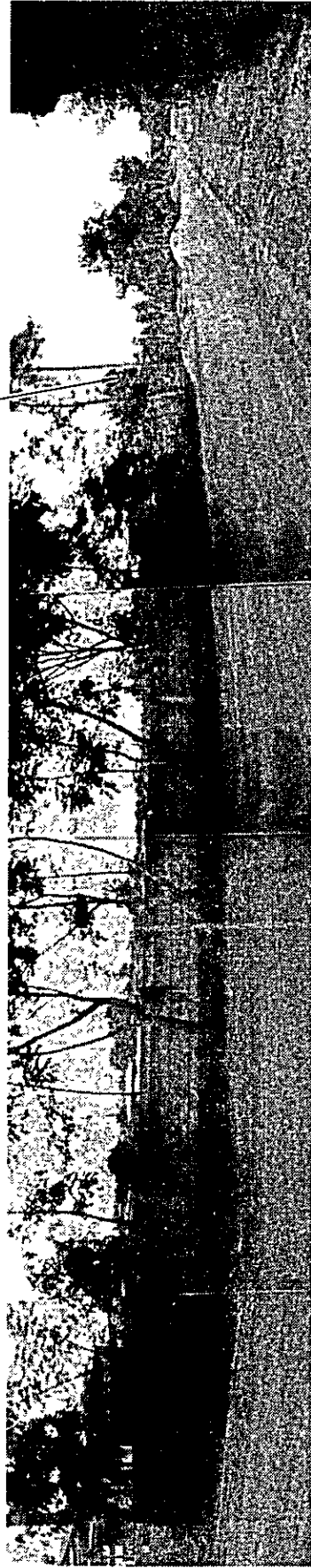
Seeing East-south from South Side of the Site

Route 335



Seeing North from South side of the Site

South-eastern Corner of the Site



Seeing the Site from route 335

Route 335



Seeing West from Center of the Site-B.

Bohol T.B. Pavilion

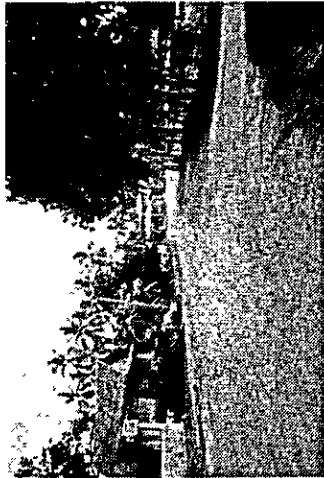


Seeing the Sanatorium from Center of the Site-B.

Approach Road to the Site-B.



Seeing the Site-B from Route 335.



Approach to Public Office of Eng.



Test Pit No. 7

South-eastern Corner



Circumference of the South-east of the Site

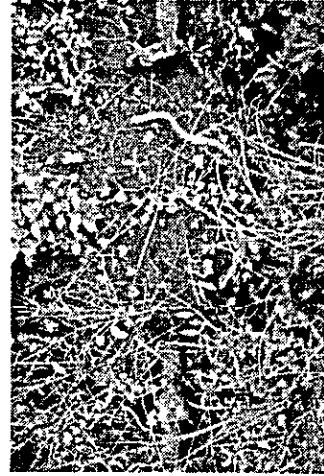


Test Pit No. 3

Soil Lab. of MA

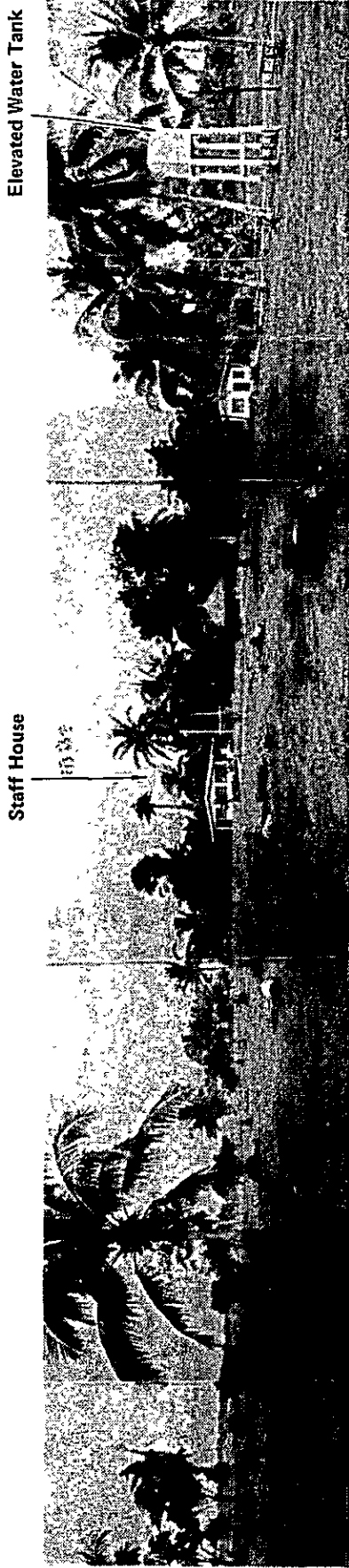


Circumference of the North-east of the Site



City Water Main Line

B) Rice Research Sub Center (Ubay)



Staff House

Elevated Water Tank

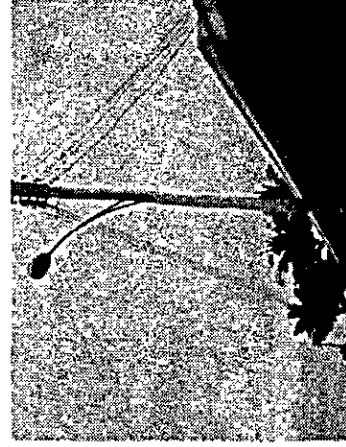
Facilities of the Bohol Experimental Station



Administrative Office



Approach to the Site



Elec. Power Line by Generator

C) Lirestock Research Sub Center (Ubay)

Director's House (over bush)



Seeing the Site from the Approach Road

To the National Road Director's House



Administrative Office Elevated Water Tank



Elec. Power Line



Facilities of the Ubay Livestock Farm

National Road Approach Road



JICA