

第9章 事業評価

ボホール農業振興コンプレックス設立プロジェクトの実施による、社会に対する有用性、妥当性を評価する。

1) 社会・経済評価

フィリピン国では、近年「都市及び地方の格差拡大」、「資本の都市部への集中」、「国民所得の不均衡」の傾向が大きく現われており、不均衡の是正のため後進地域特に、農村地域の開発促進は、同国政府の経済開発計画の主要な柱の一つとなっている。各々の後進地域において、これらの諸問題を解決していくには、各地域の特質に合わせた、適切かつ調和のとれた開発、いわゆる地域総合開発を実施していくことが、非常に有効な手法と考えられる。同国においても、こうした地方に対する開発要請は高く、国家地方開発評議会（NACIAD）においては、地方開発における総合的な開発計画に対する調査及び運営指導が進められている。ボホール州については、地域総合開発計画を必要とする重要対象地域の一つとしてあげられ、「ボホール州地域総合開発計画」のマスタープランに基づく開発が進められており、大きな効果が期待されている。

ボホール州は、農業以外の産業が主産業となることが予測し難く、将来ともこの傾向は変わらないと考えられる。従って、このマスタープランでは、農業生産性の向上を最重点目標とした計画となっており、農業部門の開発とそれに必要なインフラストラクチャーの開発が高い優先度となることは当然といえよう。又、ボホール州の立地条件からみても、農業生産物の大消費地であるセブ市を近くに有すとともに、州内に耕作可能地を多く持つことから農業開発に対するポテンシャルは高く、同国の目指す食糧自給体制へも大きな貢献が期待できる。

マスタープランでも最優先プロジェクトとされる本APCプロジェクトを、以上の観点より評価すると、ボホール州での地域適正技術の開発と普及を目標として、1) 基礎研究及び応用研究の両面から農業適正技術の研究と開発を進めるとともに、2) 在来の農業普及員のレベルアップをはかり、3) そのレベルアップされた普及員を通じ、この適正技術の普及をはかる計画であり、ボホール農業の生産性向上に大きく寄与し得る、バランスのとれた有効プロジェクトであると評価できる。

2) 技術評価

本APC施設規模は、計画される活動内容からみても、決して余裕のあるものではないが、APCの活動機能を発揮するに十分なものである。さらに、現地の類似施設グレードと比較しても過不足なく、現地の建設資機材、労力、摘法を積極的に採用することにより、建設単価のコストダウンを図るとともに、現地建設産業の助成にも寄与できる施工計画であると評価できる。

3) 財政評価

建設地の立地条件からみて、周辺インフラ整備等がフィリピン側工事となるが、負担は82,000千円程度と僅少であり、開発費用の面からの問題はないと評価できる。

本APCの施設計画では、現地の実情にあわせて施設内容や設備内容を検討しており、適切な施設運営管理が為されれば、維持管理は容易と考えられる。初年度の年間維持管理運営費の総計は、調査団の試算では約2,771,000ペソ（≒83,000千円）で、その内訳は人件費1,236,000ペソ、研修経費147,000ペソ、設備運転光熱費272,000ペソ、施設保守・資機材・消耗品・車輛維持費865,000ペソ、雑費251,000ペソである。一方、フィリピン側にて想定した初年度運営費は2,702,138ペソの予算計上となっており、当方の試算値を若干下回るが、資機材については、我国からのプロジェクト方式技術協力が実施されれば、機材供与によりその一部がカバーされるので、本APCの運営上費用の面で支障はないと評価できる。

4) 運営管理体制評価

本A P Cの運営管理体制は、農業省の職員の中から指名された所長（プロジェクトマネージャー）を中心に、研究部、研修広報部、普及部、管理部の4部より組織され、本A P Cの目的・機能に充分適したものと考えられる。さらに、A P C運営のための指針を企画立案し、他の農業関連機関の活動と調整する運営委員会、A P C活動に関する技術的アドバイスをする専門技術委員会の2つの委員会が、所長を補佐し、運営管理を円滑かつ合理的に進めるために設置され、これに日本人専門家が加わることは、現状に適合した組織体制といえる。

本A P Cに従事するスタッフは103名であり、このうち研究者や課長クラスの上級職員については農業省第7農政局からの採用が考慮されており、研究補助者クラスについては、ボホール大学等の新卒者を採用して行く計画となっており、職員の技術能力に若干の不安が感じられるが、我国からのプロジェクト方式技術協力の実施が決定した今日、A P Cスタッフの日本国研修受入れ、日本からの専門家派遣等によりレベルアップがはかれることが期待され、本A P Cの健全な運営に問題はないと評価できる。

第10章 結論、提言

1) 結 論

以上述べてきたように、後進地域とくに農村地域の開発を促進し、都市と地方の格差是正をはかり、同時に食糧の自給体制強化を目指すことを、経済開発計画の主要な目標の一つとしているフィリピン国にとって、ポホール農業の振興を目的とした、本プロジェクトは同国の社会・経済の発展に大いに寄与し、又、プロジェクト自身も財政的、運営的にも問題のないプロジェクトであり、したがって、本APC施設及び資機材の供与に関して、我国の協力によって援助する効果は大きく、我国の無償資金協力案件として適切だと勧告する。

2) 提 言

本プロジェクトの円滑な運営とAPC機能発揮による農業開発の成果は、同国の自助努力に負うところが大きく、以下の項目に留意し、プロジェクトを実施するよう提言する。

(1) 本APCは、NACIADのもとに組織される機関であるが、運営にあたっては、農業省が中心となり、APCスタッフも農業省第7農政局から多くリクルートされる計画だが、スタッフ選出を早急に行い、施設設計内容を熟知させ、施設完成後直ちに円滑な運用が行われるよう準備体制を早急に整備する必要がある。

(2) 本APCで計画される普及員研修プログラムでは、研修対象者が実務担当していることもあり、当面短期研修中心となっているが、各農作物の作期に対応した研修プログラムや、新卒者を対象とした普及員育成プログラムなどの、中・長期に亘る研修プログラムも積極的に採用し、より普及員のレベルアップをはかることが望まれる。

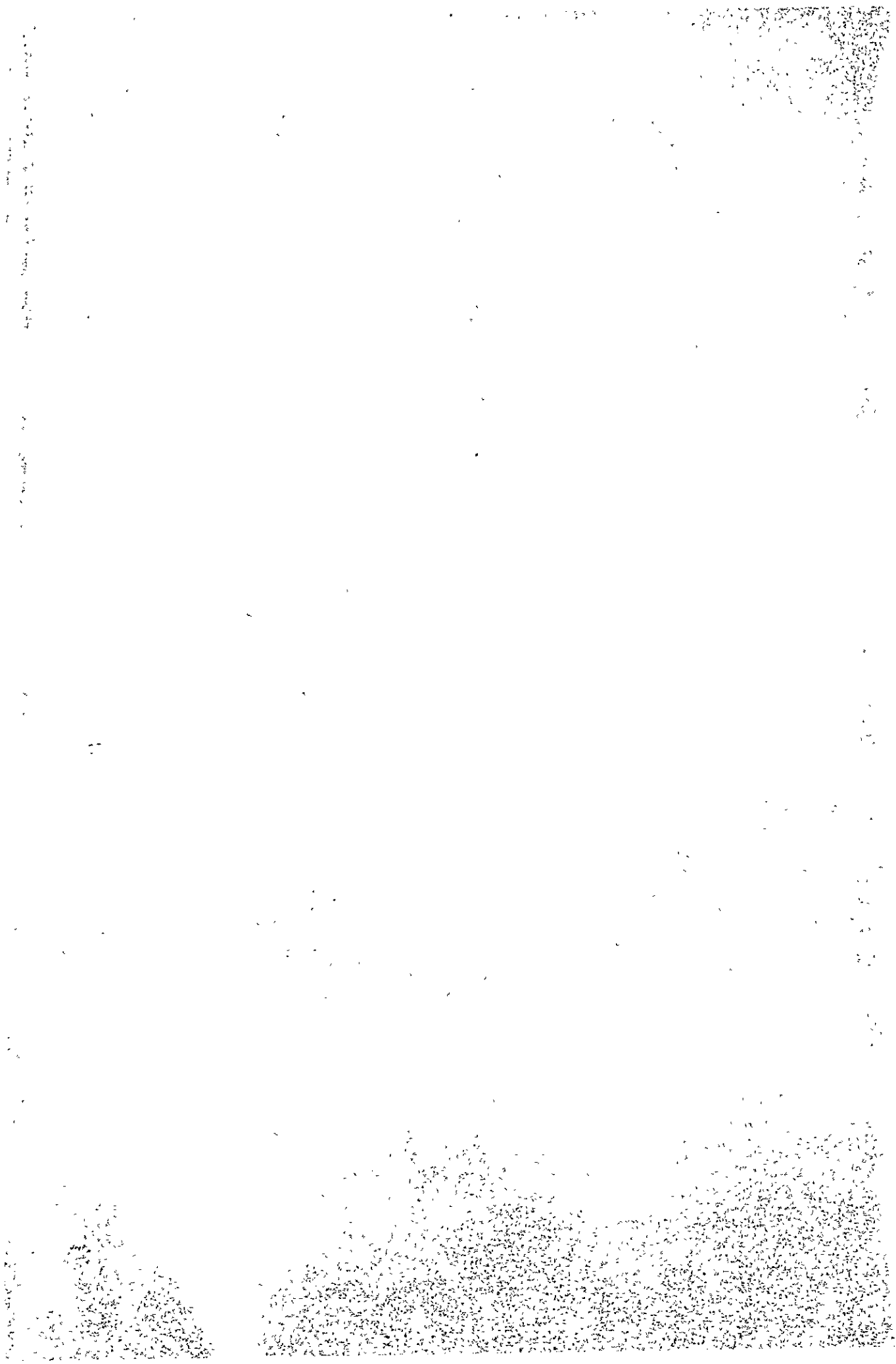
(3) APC建設に係るフィリピン側負担工事の基幹設備等の建設工程上適切な時期の接統工事実施体制の準備、建設資機材の建設現場への搬入により工期が左右されるため、輸入手続に関するフィリピン側の適確、迅速な体制の確立が望まれる。

(4) 建物の保守、各機器の操作を実際に担当する設備技師、資機材の取扱い技師を建設期間中に選任し、本A P Cに設置される設備、機器の適切な保守管理に精通させ、定期点検体制の確立、消耗備品の定期的補充体制の確保が重要である。

(5) A P C施設完成後にフィリピン側で整備する運営機能上必要な維持備品類を含め、維持管理運営費の予算確保を行い、A P C機能を円滑に発揮していく必要がある。

資料編 1

1. 調査団の派遣
2. ミニッツ
3. NACIADよりのレター
4. 建設予定地周辺状況



1. 調査団の派遣

本センターの計画、設計に当たり、基本設計調査、基本設計確認調査のため、二度に亘り調査団が派遣された。

1) 調査団の構成

- 基本設計調査団 1982年9月28日 — 10月8日 松岡和久
齊藤寛志
- 1982年9月28日 — 10月14日 平野良治
浜嶋剛
永富誠

団長	松岡和久	国際協力事業団 無償資金協力部 基本設計課 課長代理
技術協力	齊藤寛志	国際協力事業団 農業開発協力部 農業技術協力課 課長代理
建築(総括)	平野良治	俣久米建築事務所
建築(構造、積算)	浜嶋剛	同上
建築(建築計画)	永富誠	同上

- 基本設計確認調査団 1983年1月19日 — 1月29日 松岡和久
永富誠
- 1983年1月23日 — 1月29日 平野良治

団長	松岡和久	国際協力事業団 無償資金協力部 基本設計課 課長代理
建築(総括)	平野良治	俣久米建築事務所
建築(建築計画)	永富誠	同上

2) 調査協力者

本件調査にあたり、下記の方々の御協力をいただいた。

○ 在フィリピン大使館

- ・一等書記官 松浦良和

○ JICA マニラ事務所

- ・所長 三浦敏一
- ・職員 新井博之

○ フィリピン共和国側関係機関及び主要関係者

● NACIAD & BIADP

- ・ Mr. Jose P. Leviste, Jr. Executive Secretary, NACIAD
- ・ Mr. Andres A. Limcaoco Director, NACIAD
- ・ Mr. Raynoldo de Sogun Proj. Director, Bohol-IADP
- ・ Mr. Mauricio C. Feliciano Deputy Director, Bohol-IADP

● Ministry of Public Works & High Ways (公共事業省)

- ・ Mr. Rosalio 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

● Ministry of Agriculture (農業省)

- ・ 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

- Ministry of Agriculture Region VII Cebu (農業省第7農政局)
 - . Mr. Celso T. Palma Gil Regional Director
 - . Mr. Constantino F. Lucero Asst. Regional Director
 - . Mr. Anastacio L. Delmo Acting Chief, Operating Division

- Bohol Provincial Office (ボホール州庁)
 - . Mr. Rolando Butalid Governor
 - . Engr. Verevando M. Dumadog P.D.S.
Provincial Development
Coordinator

- Bohol Provincial Office of MA (農業省ボホール事務所)
 - . Engr. Mauro M. de la Cruz Executive Officer
 - . Mr. Aniano F. Bondal Asst. Officer
 - . Mr. Nicanor S. Ferrer Bohol Experiment Station
In-Charge

- Tagbilaran City Office (タグビララン市役所)
 - . Mr. Rocha Mayor

- 参 考
 - . Dr. Herminio D. Marcial Quarantine Vet. Officer
B.A.I.
Alabarg Stock Farm
 - . Mr. Julian G. Ballaran Secretary
Regulation Board
Professional Regulation
Commission

調査団の派遣

3) 調査団行程

- A) 松岡団長及び齊藤団員
- B) 平野団員
- C) 浜嶋、永富団員

基本設計調査日程

日順	月日	曜日	行 程	調 査 内 容
1	9/28	(火)	東京 <u>PR431</u> マニラ 15:30 - 16:30 16:30 - 17:00	大使館 JICA事務所にて調査日程打合せ
2	9/29	(水)	8:00 - 9:00 10:30 - 14:30 16:00 - 17:00	団内打合せ NACIAD打合せ 農業省打合せ C)建設省にて建設事情聴取
3	9/30	(木)	8:00 - 8:30 マニラ <u>PR-153</u> セブ 14:30 - 17:30	B、C) 建築家R.C. SIANGHIO打合せ 農業省 Region VI打合せ
4	10/1	(金)	セブ <u>PR-363</u> タグビララン 11:40 - 12:30 15:30 - 17:00	ボホール州知事表敬 ダオ建設予定地視察
5	10/2	(土)	7:15 - 21:00	ピラール農業大学視察 カンディハイ水産大学視察 ウバイ・ボホール実験農場視察 ウバイ・ストック・ファーム視察 ウバイ土壌試験場視察
6	10/3	(日)	8:30 - 18:00	現地農業省及びPDSスタッフと打合せ
7	10/4	(月)	A)、B) タグビララン <u>PR-364</u> セブ 14:00 - 17:30 セブ <u>PR-166</u> マニラ	農業省 Region VI打合せ C) 9:00 - 16:00 PDS電力会社 水道局事情調査

日順	月日	曜日	行 程	調 査 内 容	
8	10/5	(火)	8:00 - 16:00 17:00 - 18:00	D/Dチェック 大使館報告	9:00 - 17:00 MPWH建設事情 地質現地調査 タグピララン市内建設事情
9	10/6	(水)	8:00 - 13:30 14:00 - 17:00	NACIADと打合せ 無償工事現場視察	C)-1 8:00 - 19:00 ウバイ土壌試験場 C)-2 8:00 - 15:00 建設事情調査
10	10/7	(木)	8:00 - 16:00 17:00 - 18:00	NACIADと打合せ 大使館、JICA事務所 報告	C)-1 9:00 - 19:00 ウバイ・ストック ファーム C)-2 9:00 - 11:00 建設事情調査
11	10/8	(金)	A) マニラ PR-432 東京 B) 10:00 - 17:00	松岡、斉藤帰国 資料収集	C) タグピララン PR-314 セブ 14:30 - 15:30 セブ土壌研究所視察 16:00 - 17:00 建設事情調査
12	10/9	(土)	B) 9:00 - 13:00	マニラ建設事情調査	C) 8:30 - 11:30 建設事情調査
13	10/10	(日)	B) 10:00 - 20:00 C) 12:00 - 20:00	資料整理	C) セブ ----- マニラ B)と合流 資料整理
14	10/11	(月)	9:00 - 15:30	農業省、ストック・ファーム ノイル・ラボラトリー	視察
15	10/12	(火)	9:00 - 12:00 14:00 - 16:00 16:15 - 16:30	書類整理 Profession RegulationについてMPWH, P.R.Cにて事情聴取 JICA事務所、調査中間報告	

調査団の派遣

日順	月日	曜日	行 程	調 査 内 容
16	10/13	(水)	9:00 - 12:00 15:00 - 15:30 16:30 - 18:00	NACIAD(BIADP)にて調査事項の報告 建築家R.C.SIANGHIOと打合せ 大使館、JICA事務所へ調査結果報告
17	10/14	(木)	マニラ $\xrightarrow{\text{PR-432}}$ 東京	帰国

基本設計確認調査日程

日順	月日	曜日	行 程	調 査 内 容
1	1/19	(水)	東京 $\xrightarrow{\text{JL-741}}$ マニラ	
2	1/20	(木)	9:30 - 12:00 15:30 - 18:00	BIADPにて日程打合せ 大使館表敬、R/Dチーム打合せ
3	1/21	(金)	10:30 - 14:30 16:00 - 18:00	BIADPにてR/Dチームと合同打合せ 資料収集
4	1/22	(土)	9:00 - 12:00	資料収集
5	1/23	(日)	東京 $\xrightarrow{\text{JL-741}}$ マニラ	平野団員到着 資料整理
6	1/24	(月)	10:30 - 12:00 13:30 - 15:00 16:30 - 17:30	JICA事務所にて打合せ BIADPにて打合せ(MPWH参加) 大使館に打合せ内容の報告
7	1/25	(火)	10:00 - 12:00 15:00 - 17:30	資料収集 農業省にて打合せ
8	1/26	(水)	9:00 - 12:00 13:30 - 14:30 15:00 - 17:00	資料整理、団内打合 BIADPにて打合せ BPIにて打合せ

日順	月日	曜日	行 程	調 査 内 容
9	1/27	(木)	9:00 - 11:30 12:30 - 14:00 14:30 - 15:30 17:00 - 18:30	BIADPにてMinutes案討議 資料収集 BPIにて打合せ 資料整理
10	1/28	(金)	9:00 - 11:30 13:00 - 14:30 15:00 - 15:30 16:30 - 18:00	資料整理、団内打合せ Minutes署名 農業省にて打合せ MPWHにて打合せ
11	1/29	(土)	8:30 - 11:00 マニラ <u>JL-742</u> 東京	BIADPにて最終打合せ 帰国

ミニッツ

2. ミニッツ

基本設計調査団及び基本設計確認調査団は、先方国側との協議合意事項に関し、ミニッツをまとめ、松岡団長と先方側 Reynaldo E. De SAGUN BIADP 部長との間で署名された。

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.

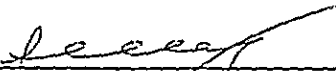
The Mission has carried out field survey and held a series of discussions with the National Council of Integrated Area Development (NACIAD) under the Office of Prime Minister, Ministry of Agriculture and concerned authorities of the GOP.

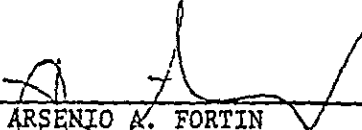
As a result of these surveys and discussions, both parties have agreed to recommend their respective Governments and authorities concerned to examine the major points of understanding reached between them, attached herewith, toward the realization of the Project.

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 "
		<hr/>
Total		411,726 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

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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
				<hr/>
				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
				<hr/>
				¥ 733.50
C. FIXED COST:				
Depreciation				¥ 40.00
Interest on capital				109.98
Rental charges				150.00
				<hr/>
				¥ 299.98

C. FIXED COSTS:

Interest on Capital Investment, Computed at

1 percent in 6 months	₱ 158.34
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	5,616.28
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
	<hr/>
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
	<hr/>
SUB-TOTAL	¥ 1,330.00
	<hr/>
	¥ 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 ($¥2,482.50 \times 0.01 \times 12 = ¥297.90$)

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
	<hr/>
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	1,919,934	5,758,350

TABLE 8. - TRAINING PROGRAM

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	SHS/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						1,375,700

FIGURE I
EXTERNAL LINKAGES OF THE
AGRICULTURAL PROMOTION COMPLEX IN BOHOL

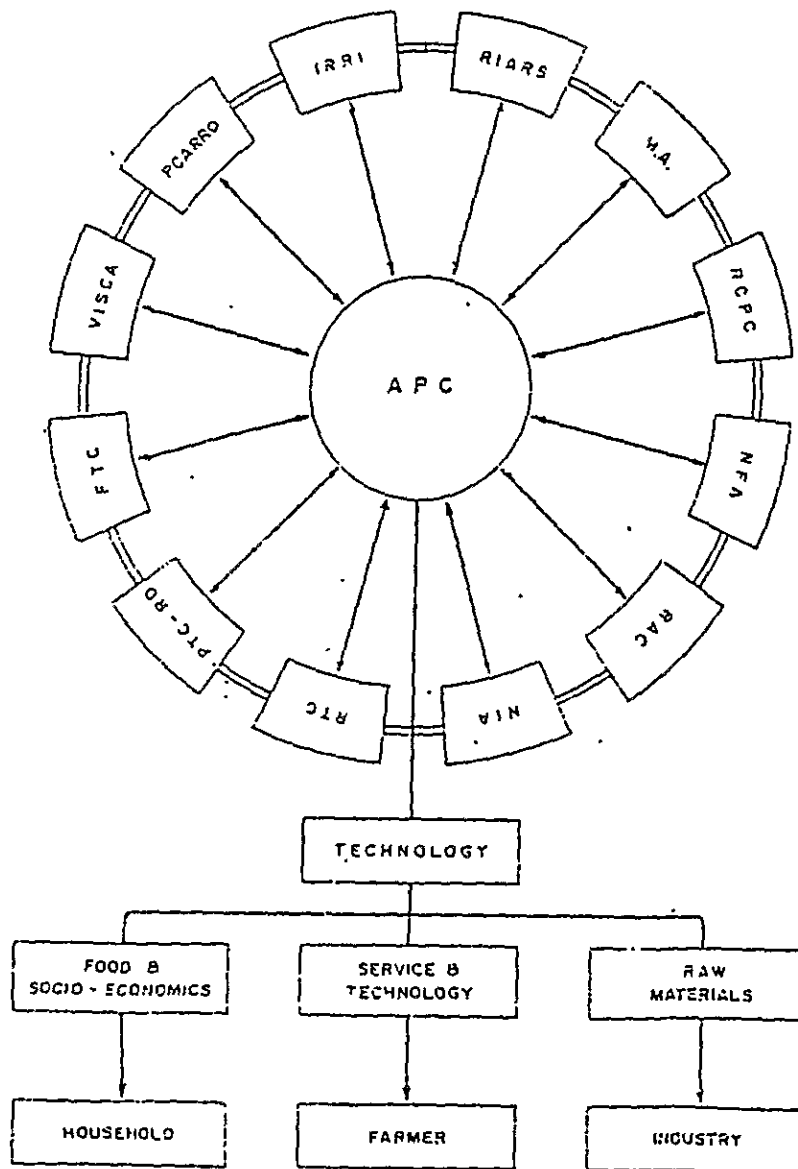


FIGURE 2
 AGRICULTURAL PROMOTION COMPLEX
 ORGANIZATIONAL SET - UP

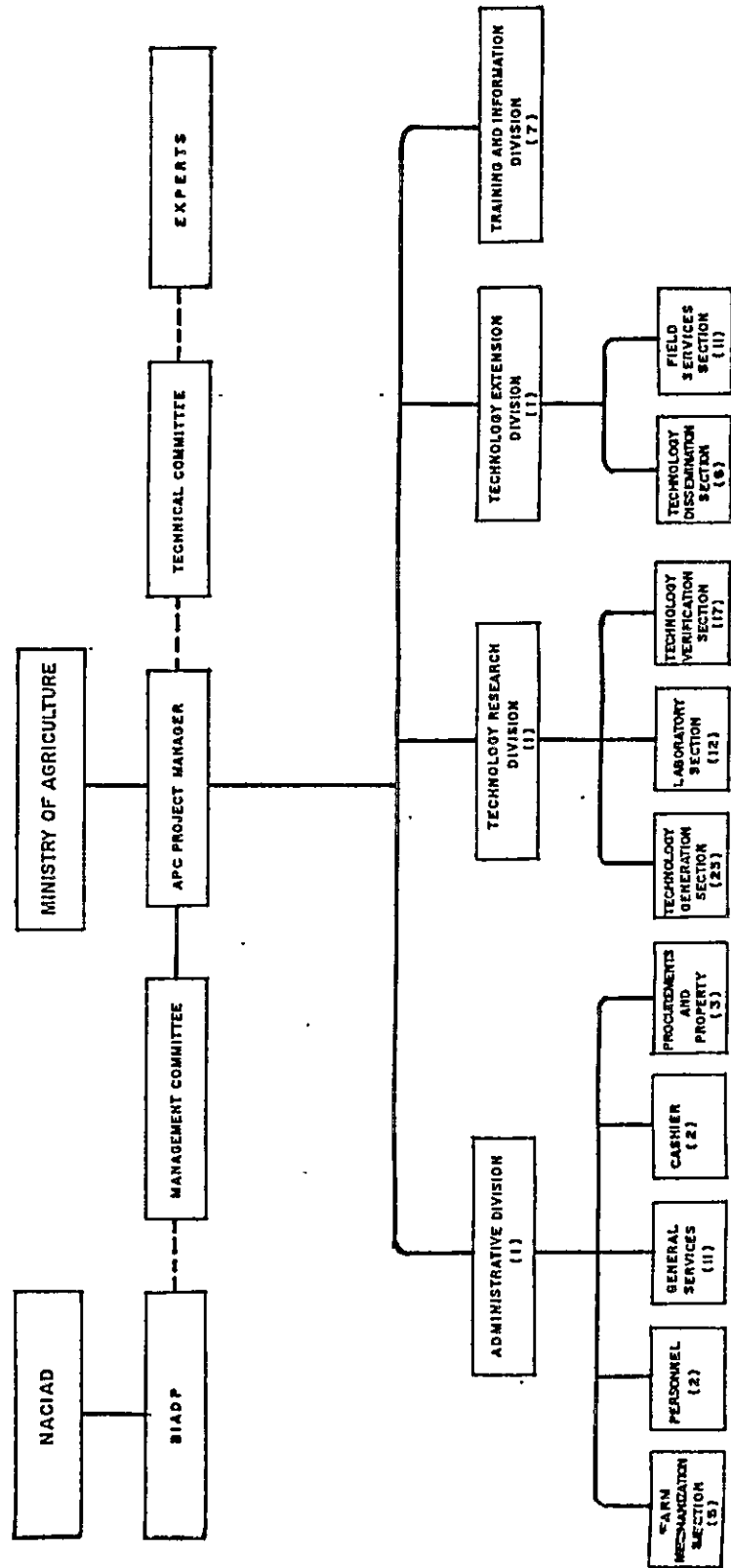


TABLE 9, Budgetary Requirement, Farm Demonstration

	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	107,286
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
TOTAL	1,634,018	1,619,483	1,659,719	1,682,657	1,647,101	7,039,947

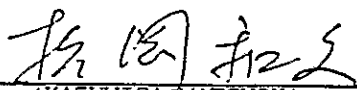
MINUTES OF DISCUSSION
ON
THE ESTABLISHMENT OF AGRICULTURAL PROMOTION COMPLEX
IN
THE REPUBLIC OF THE PHILIPPINES


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 (NACLAD) under the Office of Prime Minister, Ministry of Agriculture, Ministry of Public Works and Highways and concerned authorities of the GOP.

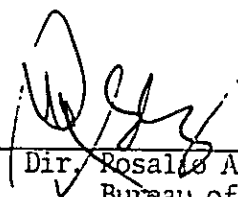
As a result of these surveys and discussions, JICA prepared and submitted a Draft Final Report on the Study and dispatched a Mission to explain and discuss on this Report from 24th to 29th January 1983. Both parties had a series of discussion on the Report and have agreed to recommend to their respective 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. Rosalia 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 $25.8 \pm 2^{\circ}\text{C}$.
 - 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

3. NACIADよりのレター

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:

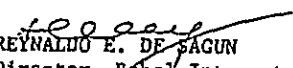
The Bohol Integrated Area Development Project coordinated with key official from the Ministry of Agriculture and a final decision was made that the site of the sub-center will be at the Bohol Experiment Station in Ubay, Bohol. Attached herewith is a copy of the letter by the Regional Director of MA.

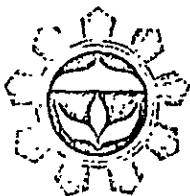
2. Budgetary Requirement of the Agricultural Promotion Complex (APC):

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, NACIAD
20 Timog Avenue, Quezon City

Dear Mr. de Sagun,

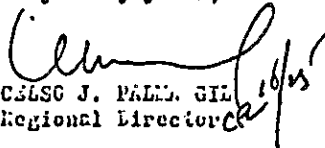
The Management and Staff of the Ministry of Agriculture, Region VII have discussed thoroughly the specific location of the satellite center of the Agricultural Promotion Complex in Bohol particularly for Ubay. In our discussion, we have decided to abide with the original plan which is at the Bohol Experiment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


CESAR J. PALMA GIL
Regional Director

Itemization of Personal Services
for Bohol APC

OFFICE/STAFF	Nature of Appointment	M O N E T H L Y				Annual Requirement
		Salary	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>1,800</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. Canvasers (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)	"	1,160	400	1,560	18,720	
		<u>16,260</u>	<u>4,000</u>		<u>243,120</u>	

OFFICE/STAFF	Nature of Appointment	M O N T H L Y				Annual Requirement
		Salary	Allowance/ Honorarium	Total	Requirement	
3.0 TECHNOLOGY RESEARCH DIVISION (53)						
1. Division Chief	on detail	-	750	750	9,000	
2. Senior Research Associate (7)	"	-	3,500	3,500	42,000	
3. Sr. Researches (7)	"	-	3,500	3,500	42,000	
4. Chemist (2)	"	-	1,000	1,000	12,000	
5. Research Assistants (12)	direct hired	7,800	2,400	10,200	122,400	
6. Lab. Aides (5)	"	3,000	1,000	4,000	48,000	
7. Driver (2)	"	1,700	400	2,100	25,200	
8. Clerk/Typist (3)	"	2,400	600	3,000	36,000	
9. Farm Aides (14)	"	8,400	2,800	11,200	134,400	
		<u>23,300</u>	<u>15,950</u>		<u>471,000</u>	
4.0 TRAINING AND INFORMATION DIVISION (7)						
1. Training Officer	on detail	-	500	500	6,000	
2. Training Specialist	"	-	500	500	6,000	
3. Artist Illustrator (3)	direct hired	2,400	200	2,600	31,200	
4. Clerk/Typist (2)	"	1,600	200	1,800	21,600	
		<u>4,000</u>	<u>1,400</u>		<u>64,800</u>	
5.0 TECHNOLOGY EXTENSION DIVISION (18)						
1. Division Chief	on detail	-	750	750	9,000	
2. Extension Specialist	"	-	500	500	6,000	
3. Research Assistants (5)	"	-	2,500	2,500	30,000	
4. Driver (2)	direct hired	1,700	400	2,100	25,200	
5. Clerk/Typist (3)	"	2,400	600	3,000	36,000	
6. Extension Aide (6)	"	3,600	1,200	4,800	57,600	
		<u>7,700</u>	<u>5,950</u>		<u>163,800</u>	
COMMITTEES						
1. Management Committee (14)						
Chairman (1)		-	500	500	6,000	
Members (13)		-	3,900	3,900	46,800	
2. Technical Committee (5)						
Chairman (1)		-	300	300	3,600	
Members (4)		-	800	800	9,600	
			<u>5,500</u>		<u>66,000</u>	
		<u>54,410</u>	<u>34,600</u>		<u>1,068,120</u>	

ESTIMATED BUDGETARY REQUIREMENT
BOHOL AGRICULTURAL PROMOTION COMPLEX

ITEM	1	2	Y E 3	R 4	5 (in Pesos)	T O T A L
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 Demons- tration	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., 69 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

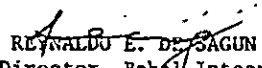
THRU: JICA Office
Makati, Metro Manila

Dear Mr. Matsuoka:

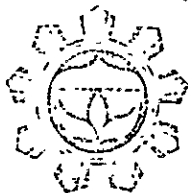
We are formally transmitting herewith the content of activities of the proposed livestock sub-center at the Ubay Stock Farm as proposed by the Philippine side. It is to be noted however, that an advanced copy of this was already forwarded to the KUME Architects in early November 1982.

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



Request FACILITIES:

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) Autogen 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 H.P. (Diesel)
2. Assorted accessories

D. TRUCKS - Heavy Equipments:

1. Ton ton pickup (1)
2. Motorcycle (2)
3. Jeep (1)
4. Tractor 50 hp (*) with accessories
5. Trainers (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
Laborer	6

II. Research Programs:

1. Effects of varying energy levels on the performance of lactating murray 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 Murray 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 - -	5015,031.00
Salaries - -	256,000.00
M.C.D. - -	<u>500,000.00</u>
TOTAL - -	5,771,031.00

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.

METHODOLOGY:

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 BAI 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 chevon 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 AI 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-beings of the farmers and their families.

DURATION : 36 months

TOTAL PROJECT COST: P229,428.00

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 : P 137,400.00

TITLE: Fejct 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 schemes, 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 carabacs 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-lefuzo 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.
 - d. 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 re-production.

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

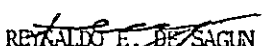
Dear Mr. Matsuura:

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



BOHOL EXPERIMENT STATION
GABI, UBAY, BOHOL

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 RIAES 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.

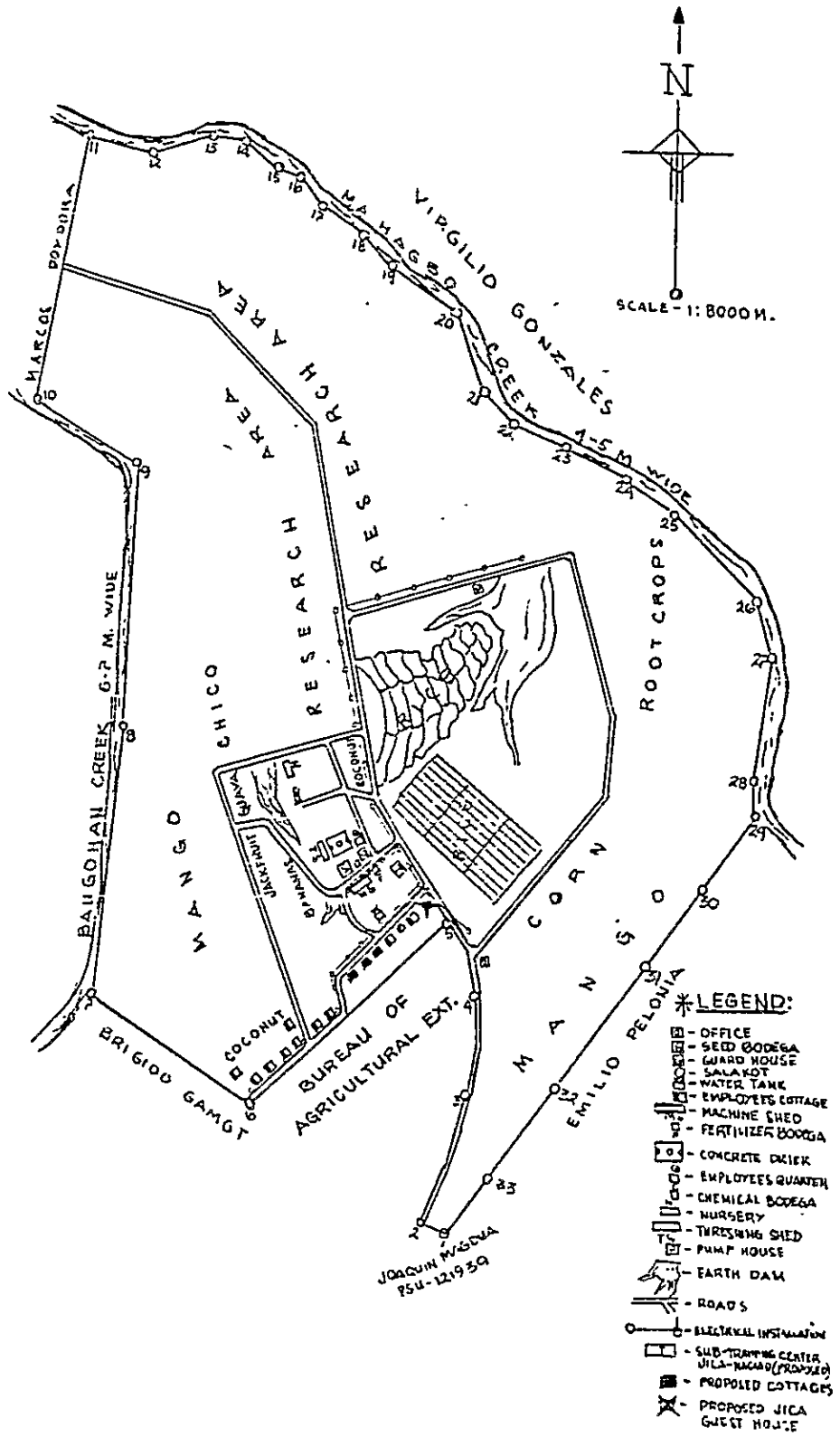
B. The Proposed Buildings

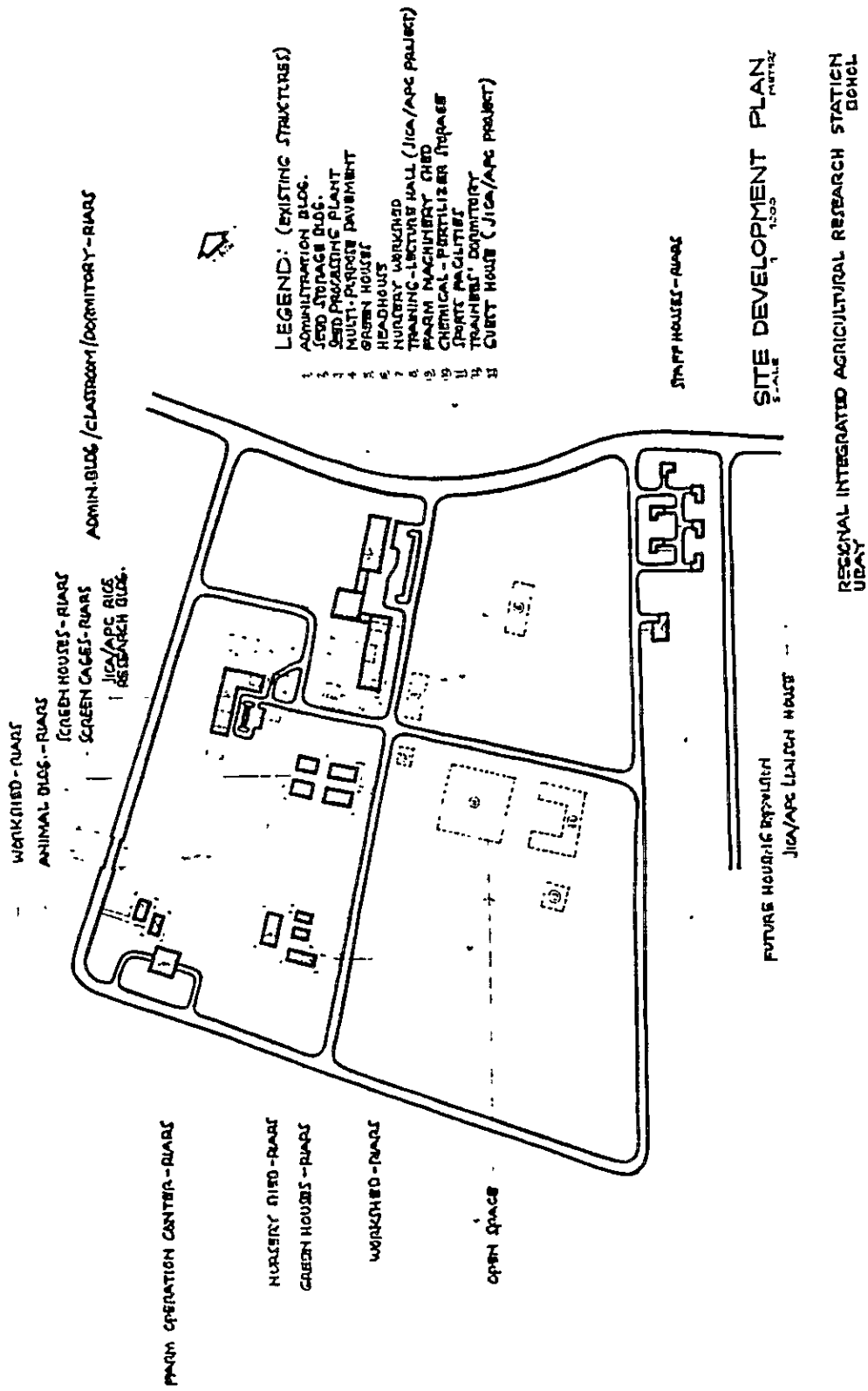
1) Sub-Research/Training Center and Dormitory

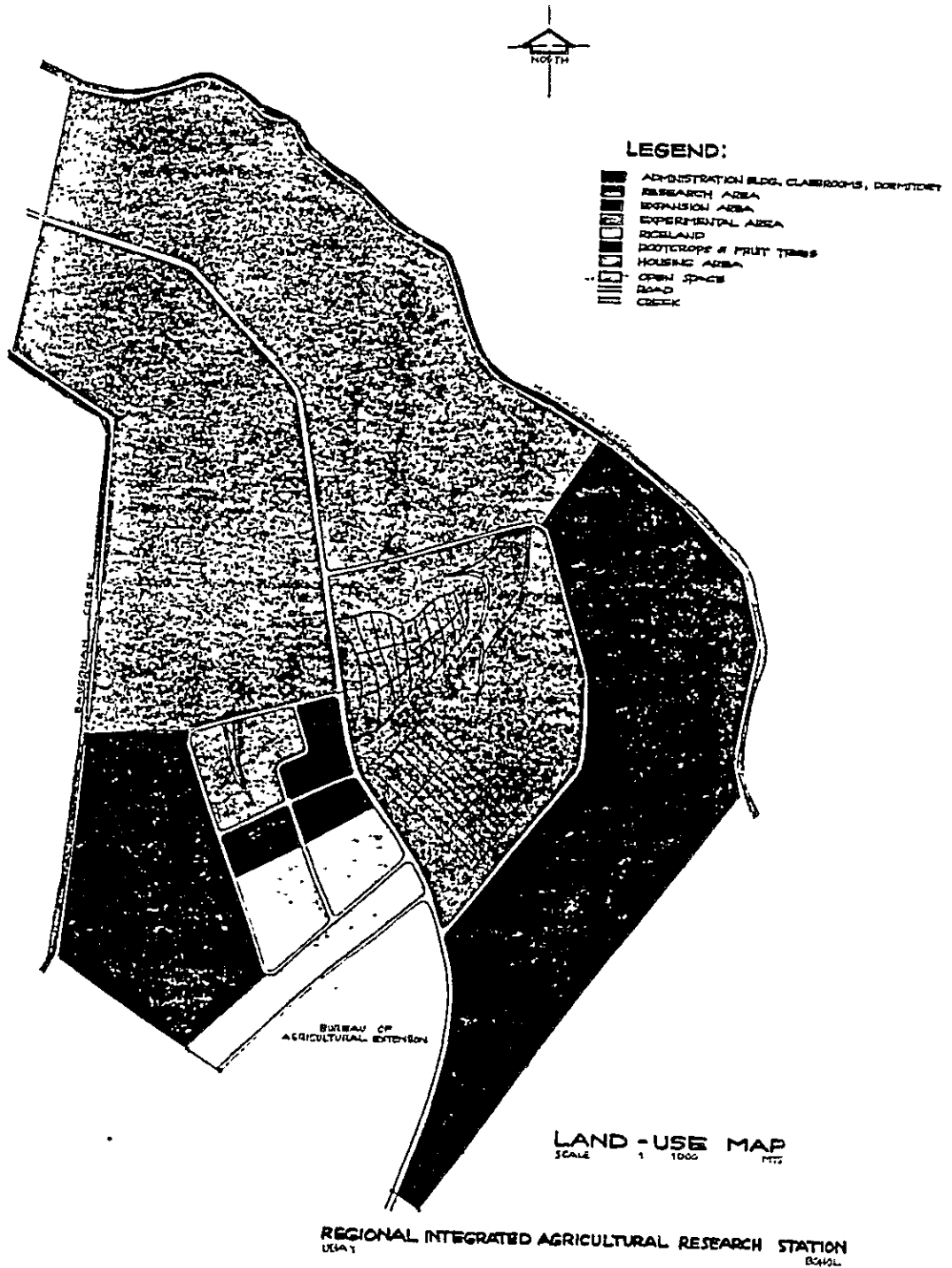
This building will serve as the nucleus of research activities in the station. Important research undertaking and consultative meetings shall be held in the center. Laboratory facilities and paraphernalia shall be housed in this building and more importantly, scientific gatherings, periodic and regular 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 accomodate guests and other participants of whatever meetings/trainings are undertaken.

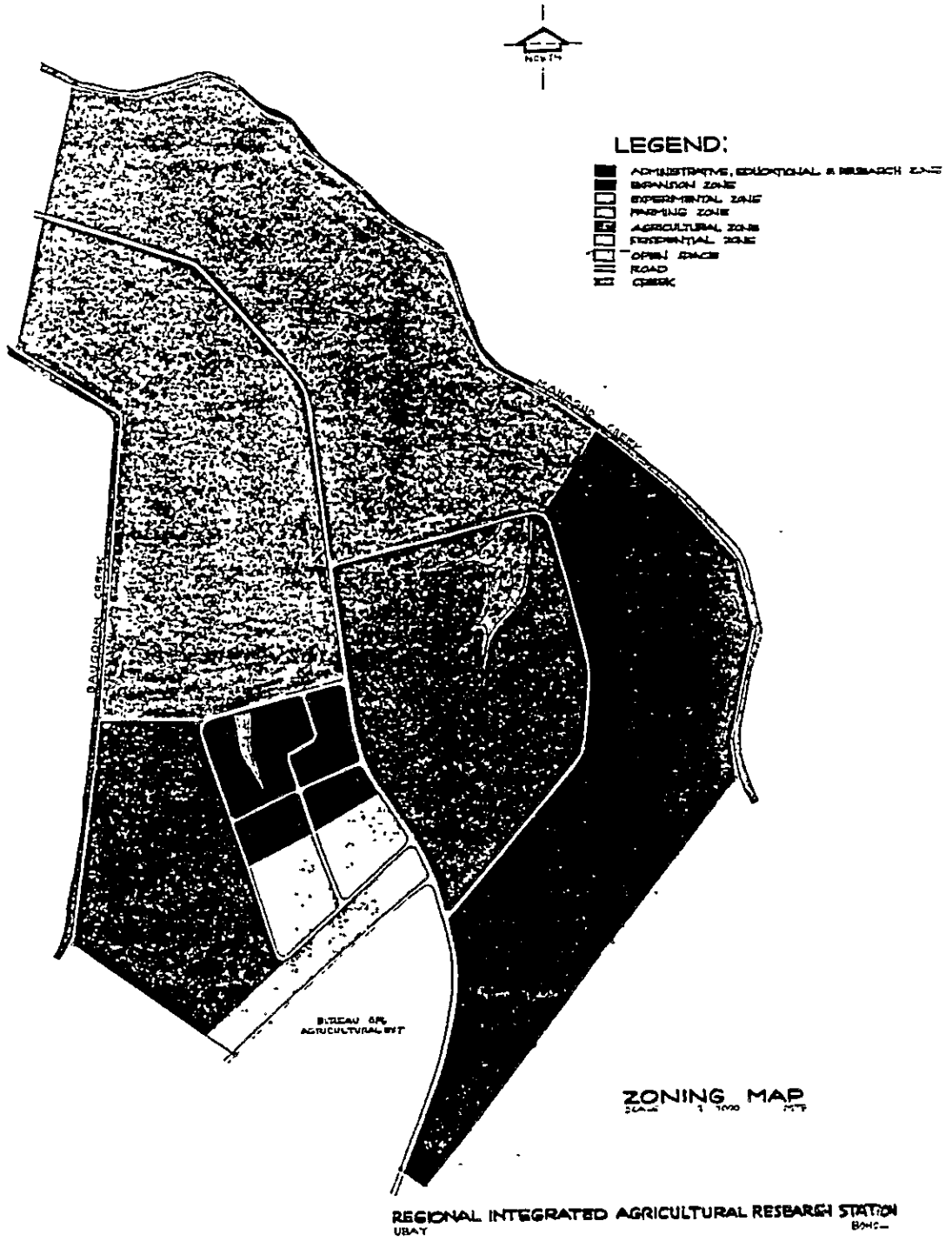
2) JICA Guest House

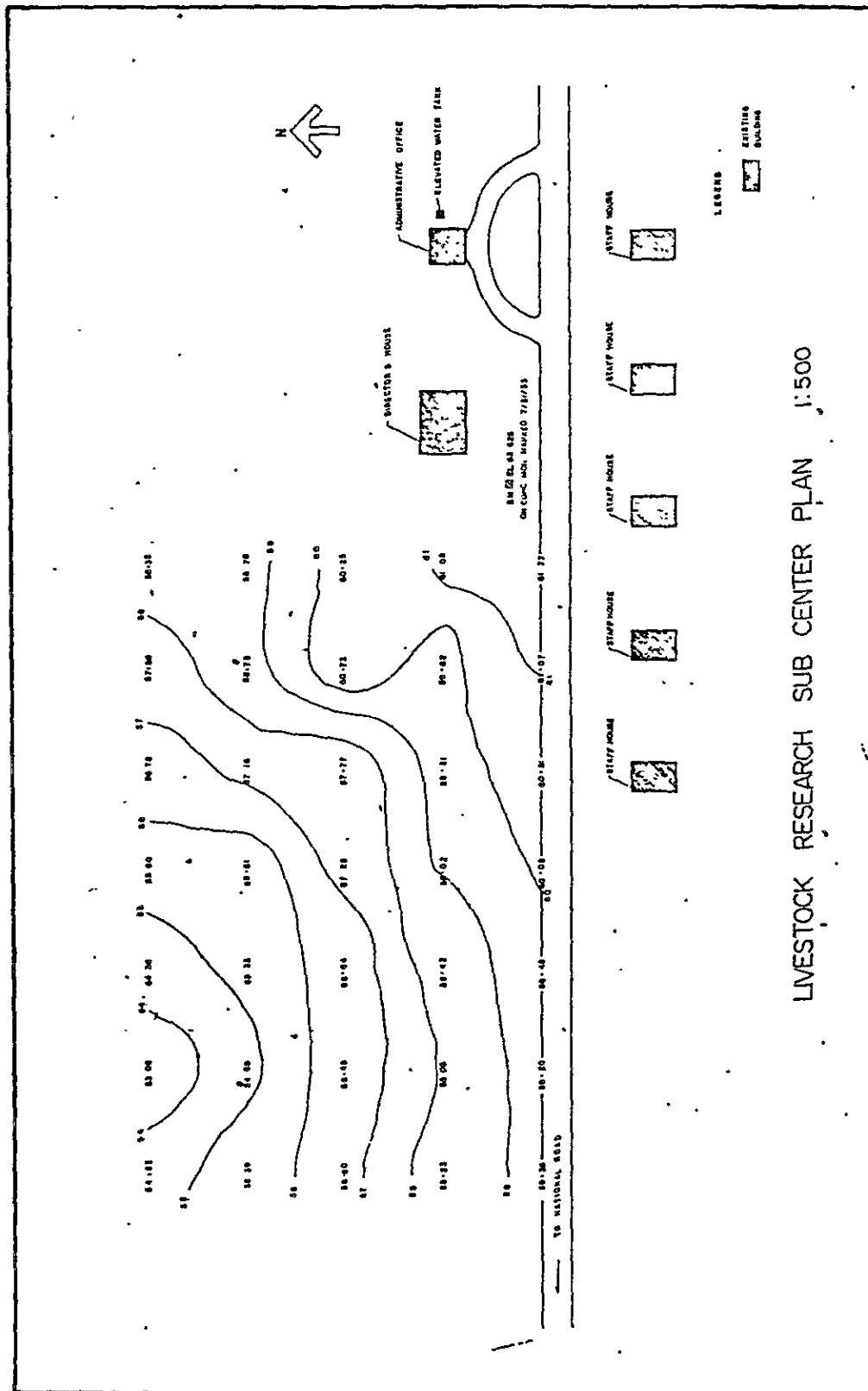
This building will be exclusively used by JICA-NACIAD executives, Very Important Persons (VIPs) from the National Offices and the Ministry. It will be well-facilitated with adequate water, light and ventilation for the comfort of the prospective occupants.





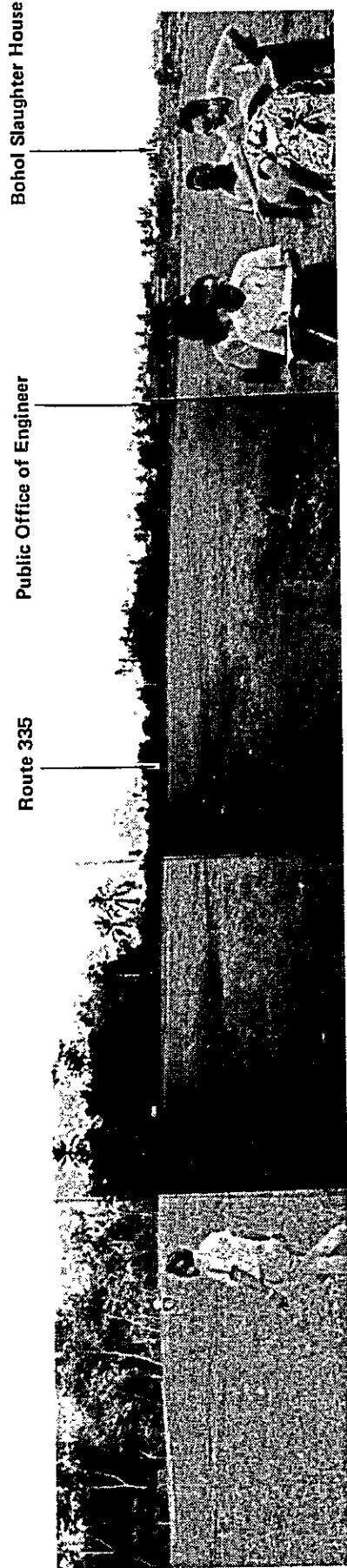




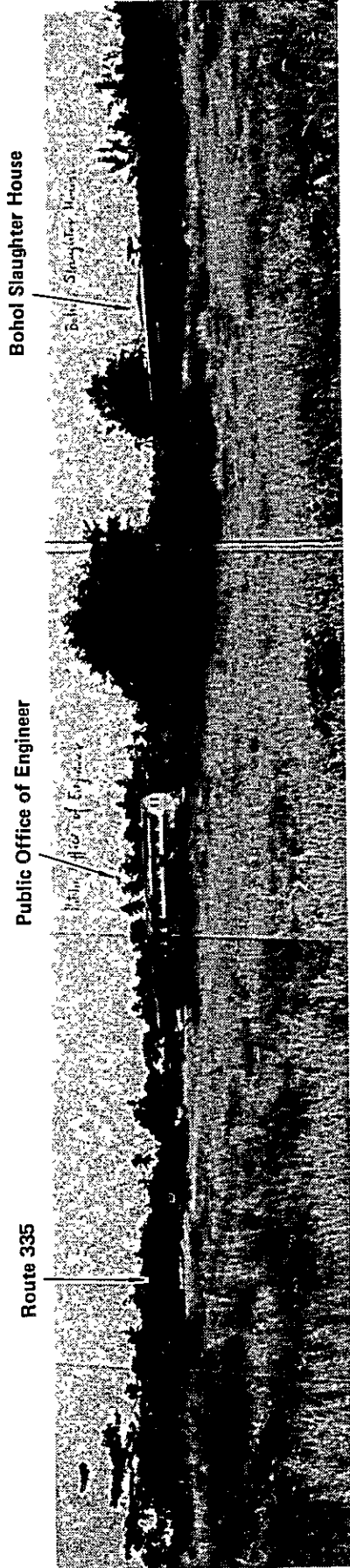


4. 建設予定地周辺状況

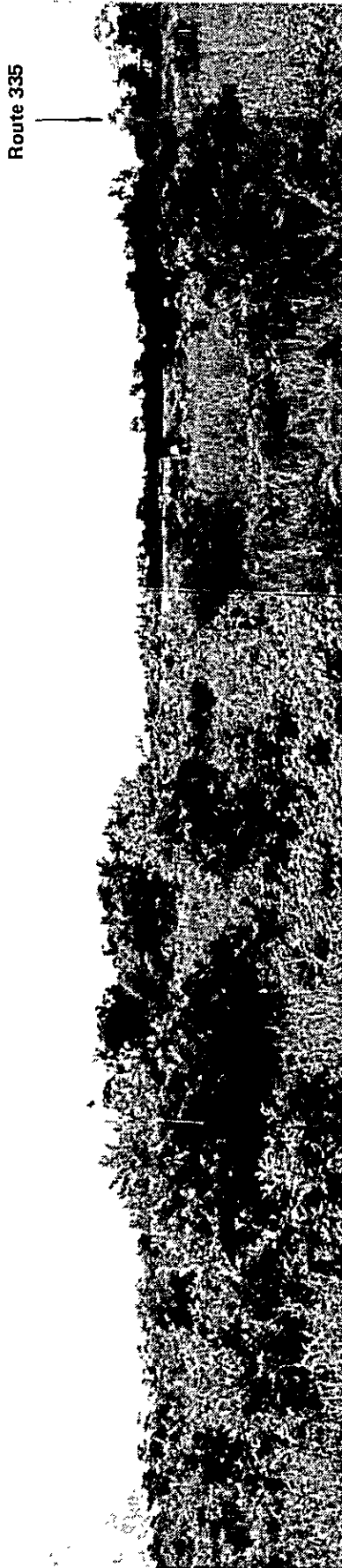
A) メインセンター（ダオ）



敷地中央より東～南方向を見る



敷地南側より東～南方向を見る



敷地南側より北方向を見る

Public Office of Engineer

South-eastern Corner of the site



国道335号線より敷地を北に見る

Route 335



飛地中央より西方向を見る

Bohol T. B. Pavilion



飛地より北に隣接するサナトリウムを見る

Approach Road to the site-B

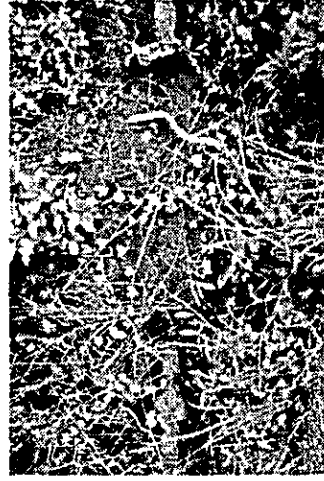


国道335号線より右手に飛地を見る

Soil lab. of M/A



敷地北東周辺



既設市水本管

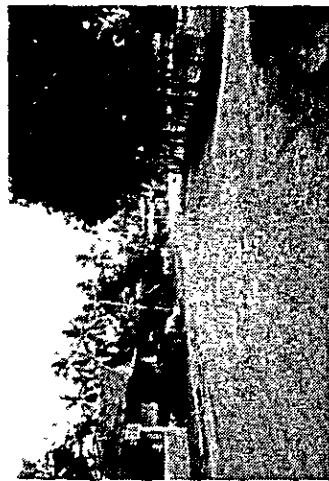
South-eastern Corner
Elec. Power line



敷地南東周辺



テストピット No.3



Public Office of Eng.入口周辺



テストピット No.7

B) 稲作研究サブセンター（ウバイ）



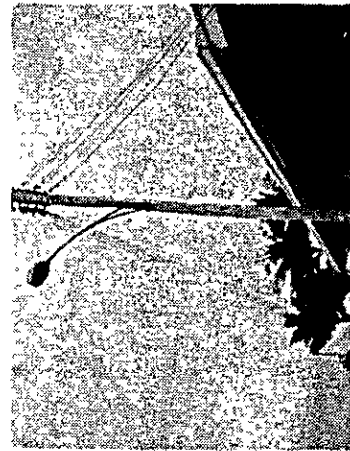
ポホール実験農場施設を見る



既存管理棟



アブローチ道路

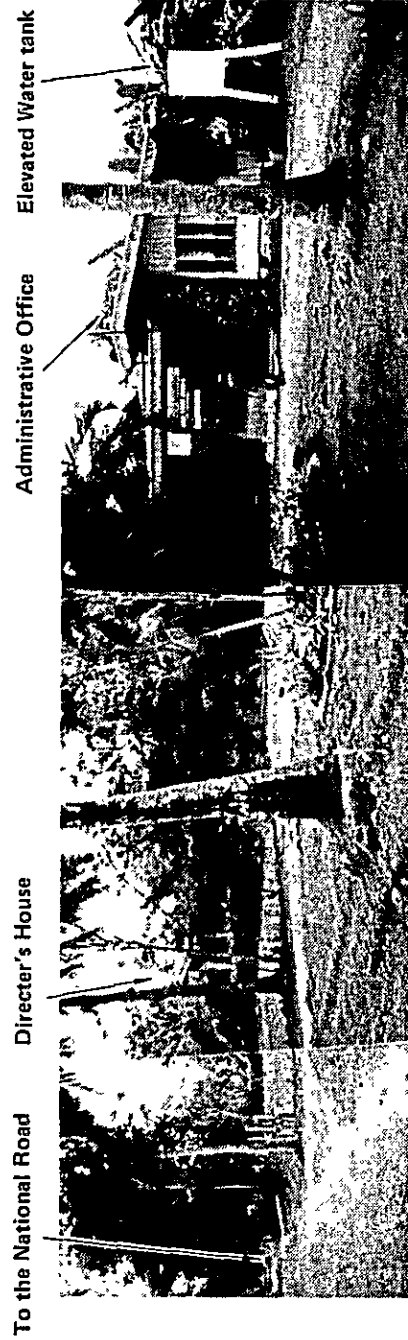


農場内自家発配電線

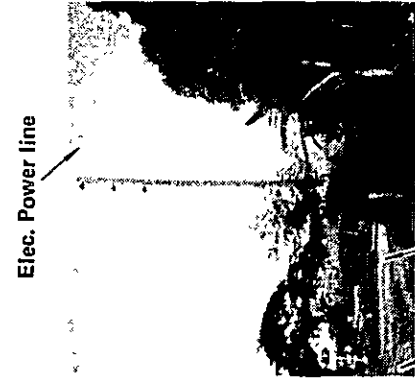
C) 畜産研究サブセンター(ウバイ)



アプローチ道路より北に敷地を見る



既存施設群



国道周辺

資料編Ⅱ

1. 国情一般

地理、人口、宗教・言語、経済、我国との関係、交通

2. 気象条件

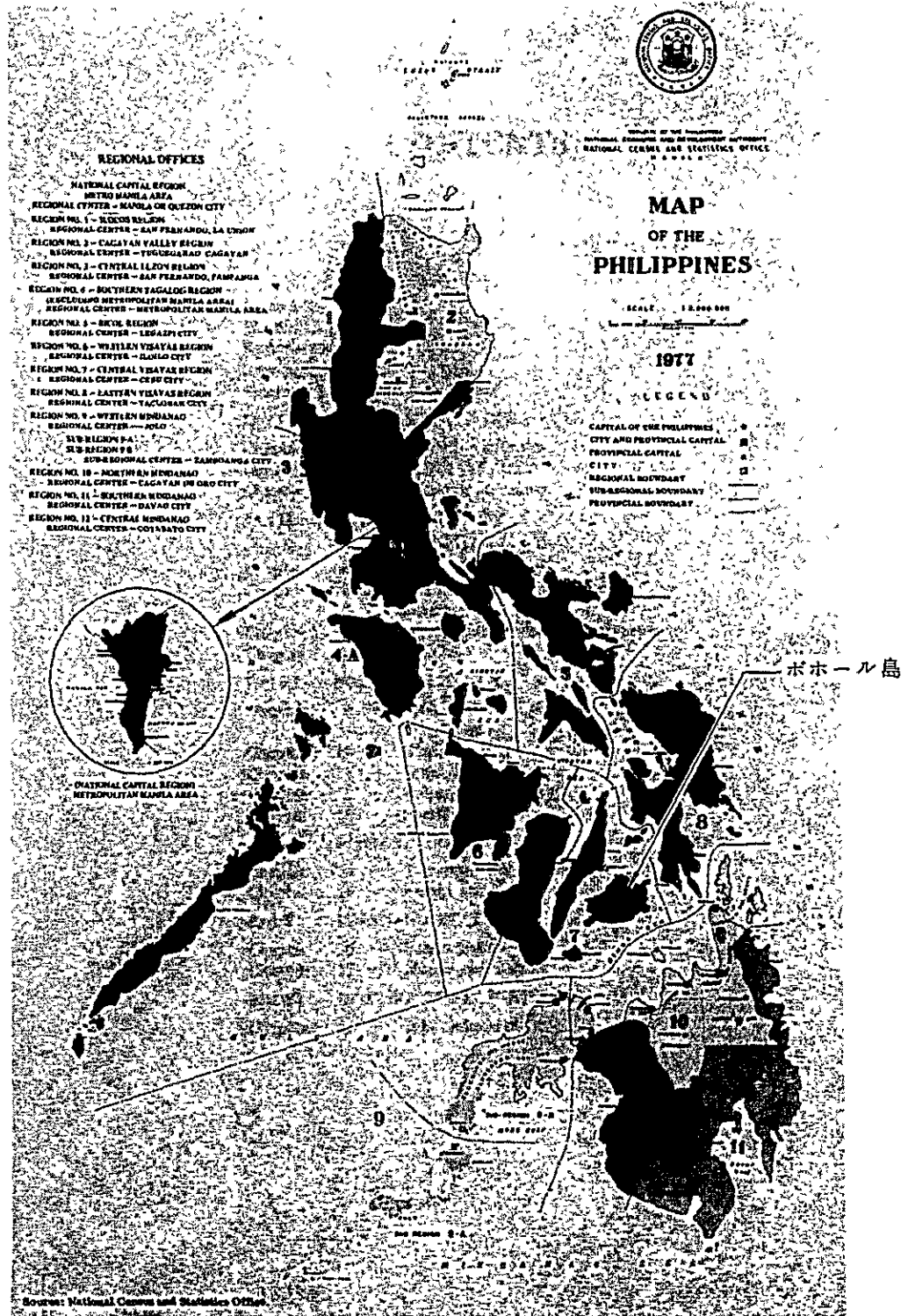
温・湿度、降雨・風、地震・落雷

3. 建築関連法規

4. 建設事情

建設業界、建設工事の実態、日本建設業者の活動

建設資材、資材運搬、労務事情、建設コスト



ボホール州都タグビラン (Tagbilaran) 市内



トライシクル (三輪車) の
多いメインストリート状況

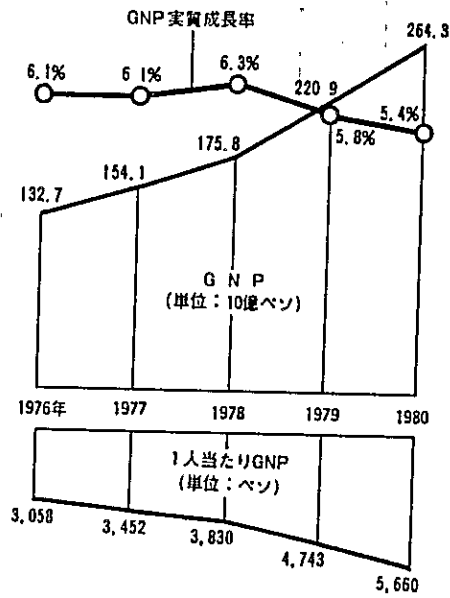


市場付近の繁華街

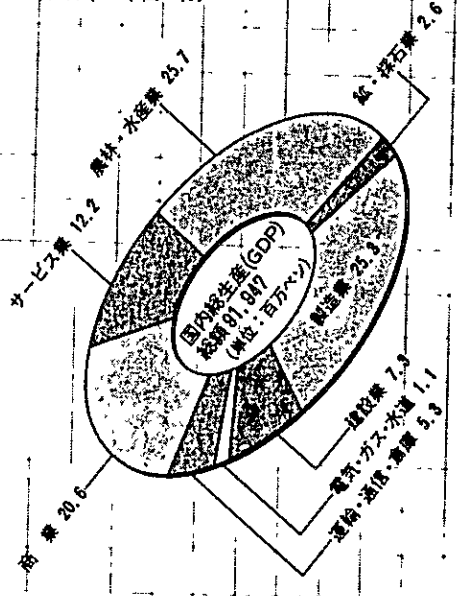


住居地域の状況

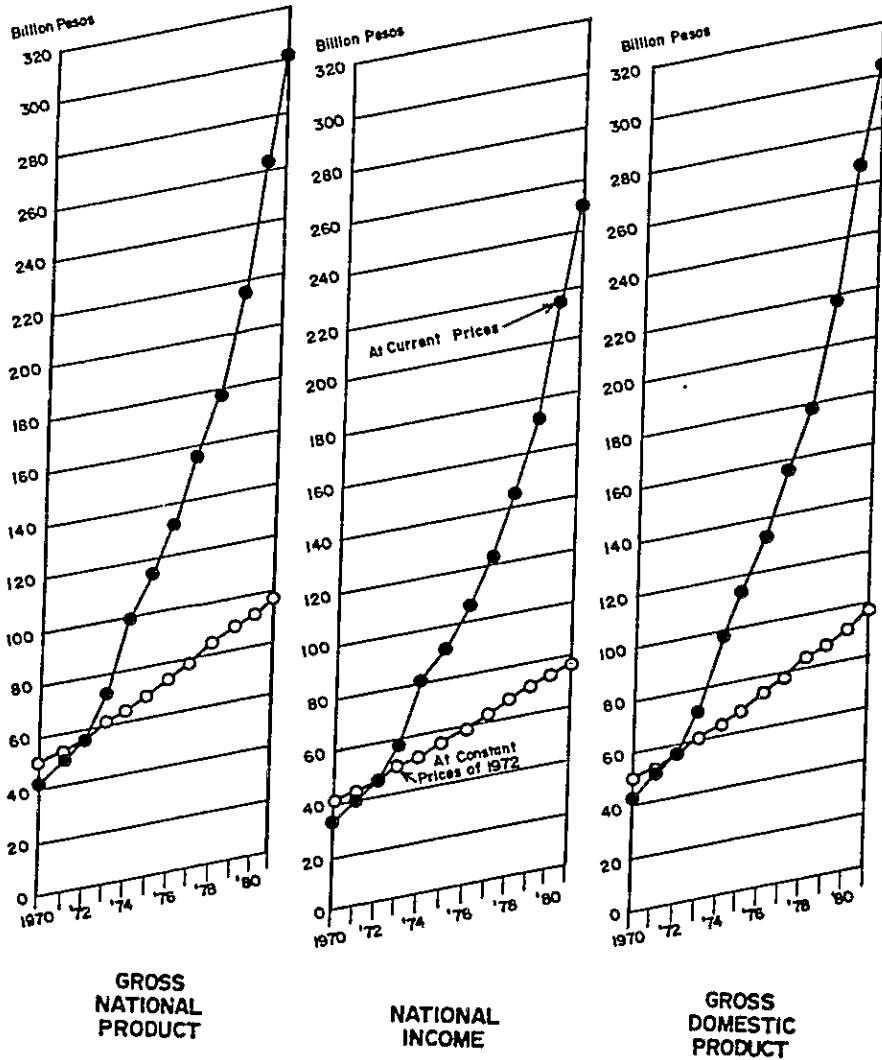
●フィリピンの国民総生産(GNP)



●フィリピンの産業構造 (GDP構成比)
(1980年 単位: %)



出典: APIC (国際協力推進協会) 1982年11月号



1. 国情一般

地 理

国土は、インドシナ半島の東部に位置し、北緯 $4^{\circ}30'$ ～ $20^{\circ}30'$ 、東経 $117^{\circ}15'$ ～ $127^{\circ}30'$ にある。ボホール州はフィリピン諸島のほぼ中央、首都マニラの南方約600 kmに位置している。

国土面積は、299,404 km²（日本の約8割弱程度）を有し、南北1,851 kmにわたって散々する7,107の島で構成され、行政上12の地方区に分けられている。

人 口

約4,809万8千人（1980年5月人口調査結果）で、最近5ケ年の平均人口増加率は、年2.6%、人口密度は平方キロメートル当り160人である。ボホール州の人口は約80万5千人、人口増加率は年1.5%、人口密度は平方キロメートル当り195人となっている。

宗教・言語

国民の約93%がキリスト教を信仰し、その殆んどがカトリック教徒であり、残り7%は回教徒等である。

言語については、マレー・ポリネシア語系タガログ語を基礎とするフィリピン語と英語が国語とされ、特に英語は行政など公用語として一般に使用されている。

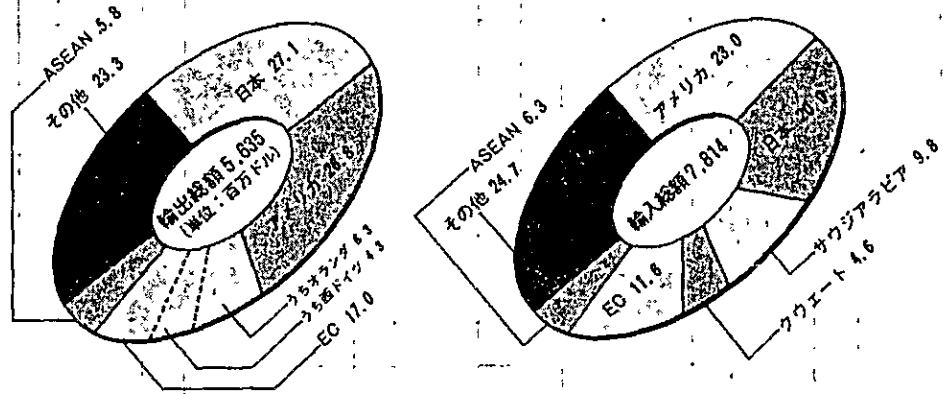
経 済

1970年代に入ってから社会・地域開発の促進、輸出振興産業の育成、物価抑制と国際収支の安定化などの諸政策により、1970年から78年にかけての実質経済成長率は年率6.4%と著しい成長をみせた。

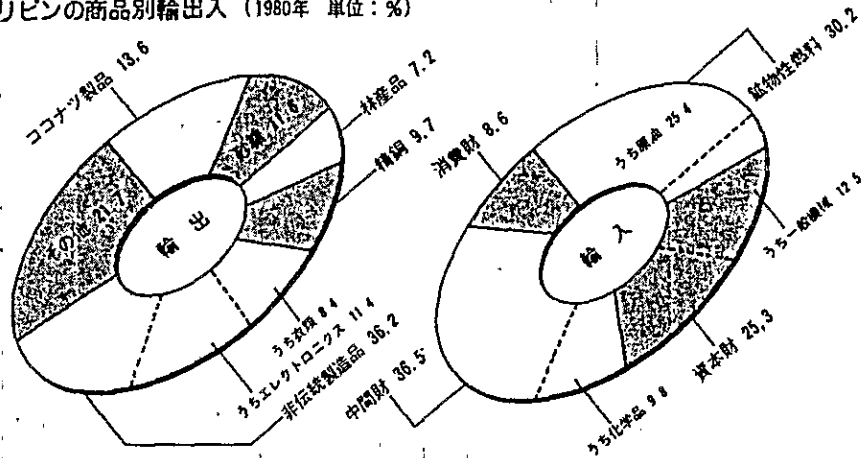
しかしながら、79年の第2次石油ショックによる原油価格の高騰と世界的不況による輸出低迷、インフレ激化などで国際収支は依然として悪化している。政府は経済効率の向上と産業構造の大幅な変革を目指した10ケ年（1978～87年）の長期開発計画を策定し、それらに基づいた第5及び第6次開発計画を実施している。

尚、産業別動向としては、フィリピン経済の基盤をなす農林・水産業の国内総生産（G. D. P.）構成に占めるシェアは年々低下の傾向にあり（1972年：27.9%、1980年25.7%）、近年製造業がそれらの基幹産業と並ぶほどにそのウェイトを高め、輸入代替工業化の基礎づくりを推し進めている。

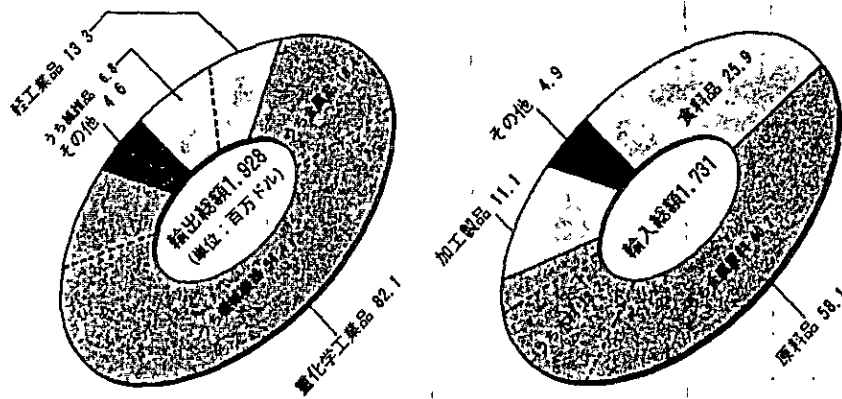
●フィリピンの国別輸出入 (1980年 単位：%)



●フィリピンの商品別輸出入 (1980年 単位：%)



●わが国の対フィリピン商品別輸出入 (1981年 単位：%)



出典：APIC (国際協力推進協会) 1982年11月号

わが国との関係

今日両国は、緊密で安定的な友好関係を保持しており、貿易面ではフィリピンからは農林・鉱業関係一次産品の輸出が、又日本からは機械・鉄鋼・化学等の工業製品を輸出するという、垂直的補完型の関係にあるといえよう。

経済協力関係では、フィリピンはわが国の政府開発援助（O.D.A.）の重点対象国の一つでもあり、1981年度は総額で2億1,005万ドル（無償資金協力2,332万ドル、技術協力2,165万ドル、資金協力1億6,508万ドル）の援助を実施している。

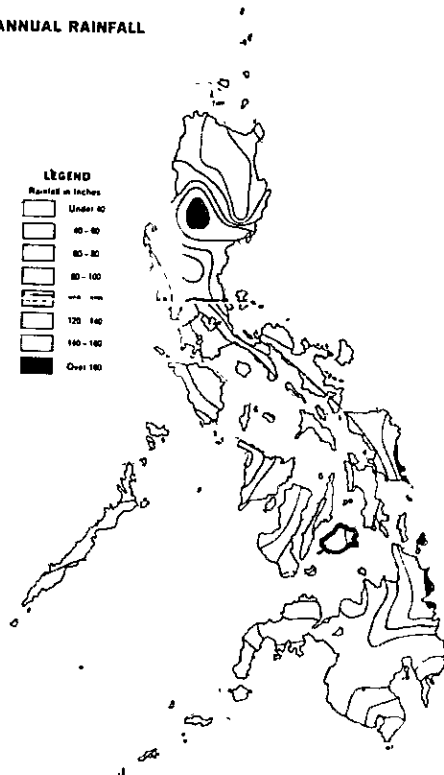
交 通

各島間の交通の主力は航空及び船舶で、特に物資輸送は船舶に依る海運に依存し、船舶は最も経済的な交通手段として総交通量の約85%を占めている。

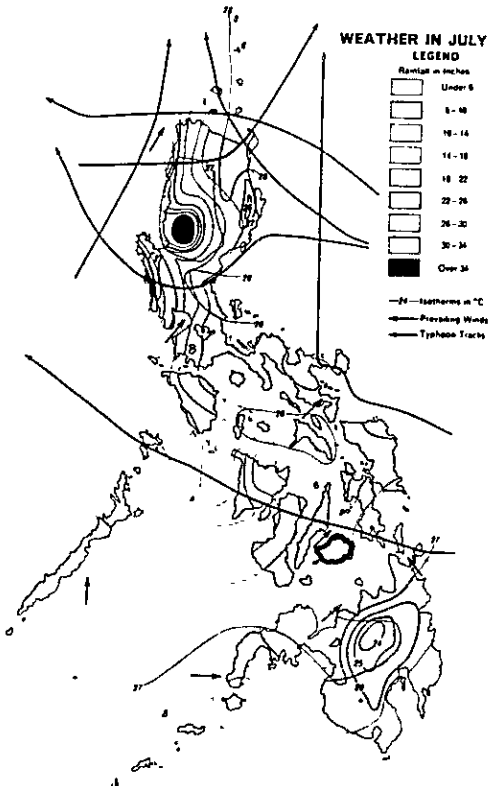
鉄道は、国鉄がルソン島の南北に1本と一部私鉄があるのみで、島内交通の殆んどはバス、ジブニーやトラックが主流となっている。徐々に道路整備が行われているものの、全体に舗装率が低く（国道舗装率41%……1978年調査）又、都心部では車の増加と共に年々交通渋滞は激しさを増してきている。

（道路の総延長距離135,000km、鉄道総路線延長距離1,450km……1979年調査）

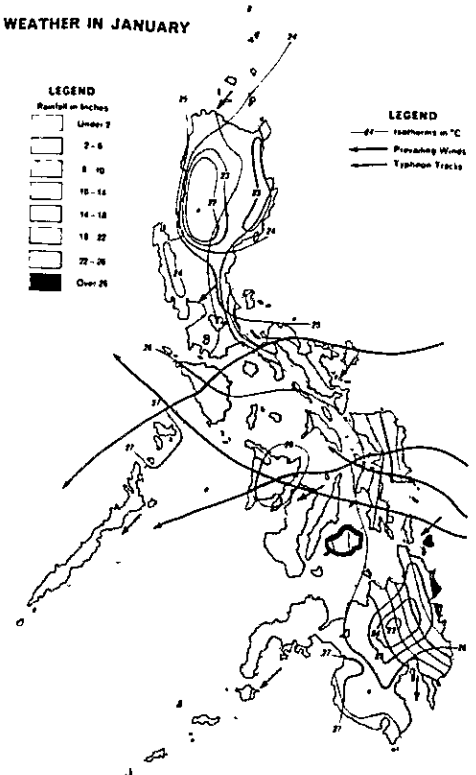
ANNUAL RAINFALL



WEATHER IN JULY



WEATHER IN JANUARY



2. 気象条件

温・湿度

フィリピンは典型的な熱帯性気候で雨期（6～10月）と乾期（11～5月）があるが、1年を通じて温度差はあまりない。

ボホール州タグピラランにおける気象データ（1981年）を下記に示す。（表4-2-1参照）

年間平均気温	27.4 °C
年間最高平均気温	29.2 °C
年間最低平均気温	26.0 °C
最高気温	33.8 °C
最低気温	21.5 °C
年間平均湿度	84 %
年間最高平均湿度	88 %
年間最低平均湿度	24 %

降雨・風

年間降雨量は、多い所で3,000～3,500mm、少ない所で1,000mm程度と地域によってかなりの差がある。

降雨の殆んどは雨期に集中し、スコールの様な集中豪雨が多い。

風は2～9月頃は南から、10～1月頃は東北の風が吹くが強風は台風時ぐらいで通常は10m/s未満である。

ボホール州においては、降雨量は比較的少なく（年間降雨量1,400～1,500mm）若干の雨期・乾期の傾向を示す程度である。

又、地域的に台風の来襲頻度も少なく全般的に気象条件は安定している。

風力地域図

(Source: National Structural Code for Buildings.)

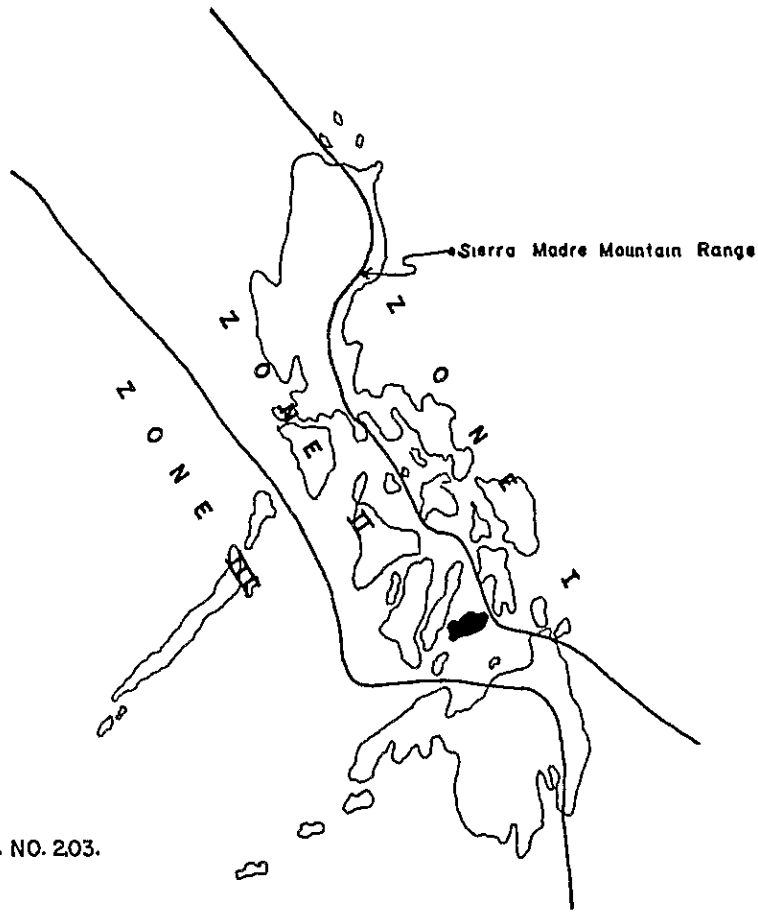


FIG. NO. 203.

ZONE I

V=200 KPH = 125 MPH
p=300 ksm = 60 psf, h above 100'
p=250 ksm = 50 psf, h 30' to 100'
p=200 ksm = 40 psf, h 0 to 30'

ZONE II

V=175 KPH = 108 MPH
p=250 ksm = 50 psf, h above 100'
p=200 ksm = 40 psf, h 30' to 100'
p=150 ksm = 30 psf, h 0' to 30'
Recommended wind pressure
per unit area of vertical projections

ZONE III

V=153 KPH = 96
p=200 ksm = 40 psf, above 100'
p=100 ksm = 30 psf, 30' to 100'
p=100 ksm = 20 psf, 0 to 30'

LEGEND:

KPH = kilometers per hour
MPH = miles per hour
ksm = kilograms per square meter
psf = pounds per square foot

地震・落雷

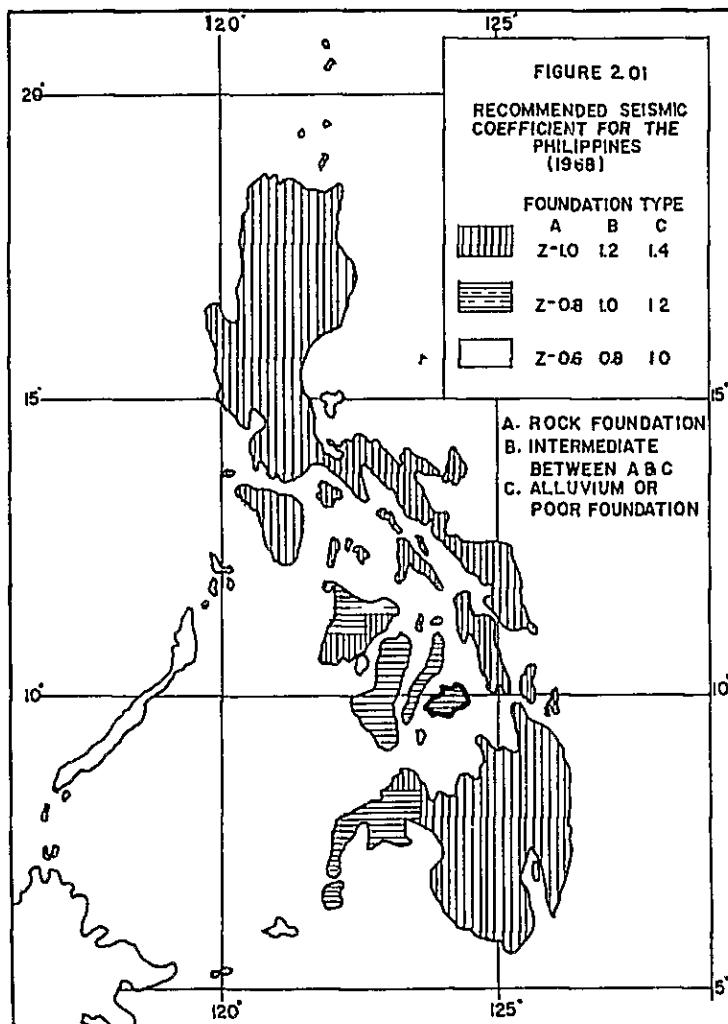
フィリピン諸島は環太平洋地震帯の一角に位置し、又、サマル(SAMAL)島、及びミンダナオ(MINDANAO)島東部にはフィリピン海溝があり、日本国ほどではないが地震国のひとつである。

過去の記録によるとマグニチュード6以上の地震も発生しており、現在でも中震以下のものが年に数回程度の割合で起きている。

尚、雷は雨期の6月頃に多く発生しているが、落雷による被害例はあまりない。

地震地域係数図

(Source: Natural Structural Code for Buildings)



3. 建築関連法規

日本の建築基準法及び消防法に該当するものに次の様な法規がある。

- National Building Code of The Philippines.
- National Structural Code for Buildings.
- The Firecode The Philippines and Regulations.
- The Philippines Electrical Code.
- The Code on Sanitation.

又、技術規準として

Electrical, Mechanical, Chemical, Civil, and Sanitary Engineering Laws of the Philippines などがある。

内容は建築許可申請、竣工検査に関して、地域指定、高度制限、建物の壁面線及び敷地境界線との空地の規定、建物の各部についての開口面積、換気、採光、防災に関する規定、構造計画に関する規定等である。

日本企業による建築活動について

一般的に日本企業がフィリピン国において建築活動を行うためには、Professional Regulation Commission (P.R.C.) に登録申請し、活動の許可を得なければならないとされている。

具体的には、i) 企業説明書、ii) 建築家の活動に関する法規、iii) 外国企業が日本国で活動する場合の法規制等を準備し P.R.C. へ申請する。そして P.R.C. では、内部の委員会の許可審査を経て決定される。承認に当たっては、日本国での外国企業の活動条件と同条件のもとで承認される見込みであるが、過去においてその事例は見当たらない。

4. 建設事情

建設業界

近年、各種のインフラストラクチャーの整備と共に、国内総生産（G.D.P.）に占める建設部門の構成比は1973年の4%から1979年には7.4%と急成長を遂げ、現在もメトロマニラを中心に活発に工事が行われている。

しかしながら、建設資材や労務費の連続的高騰、更には労働者の海外流出に依る熟練工の不足等の影響もあって、業界全体としての業績は不振状態にある。

建設業者の数は全国で約3,900社余あるが、このうち上位3社（Construction & Dev. Corp. of the Philippines, Engineering Equipment, Inc., Atlantic Gulf & Pacific Co. of Mla, Inc.）に依る工事実績は他社を大きく引き離しており、特に第1位のC.D.C.P.は圧倒的な売上高を誇っている。

尚、参考としてボホール及びセブ市の大手建設業者を下記に示す。

大手建設業者リスト

(BOHOL)クラス B; 資本金500万ペソ以上

1. Tantrade Corporation
2. F.S. Cabagnet Construction
3. Daughson Construction
4. Ticon Construction
5. Jabines Construction

(CEBU CITY)クラス A; 資本金500万ペソ以上

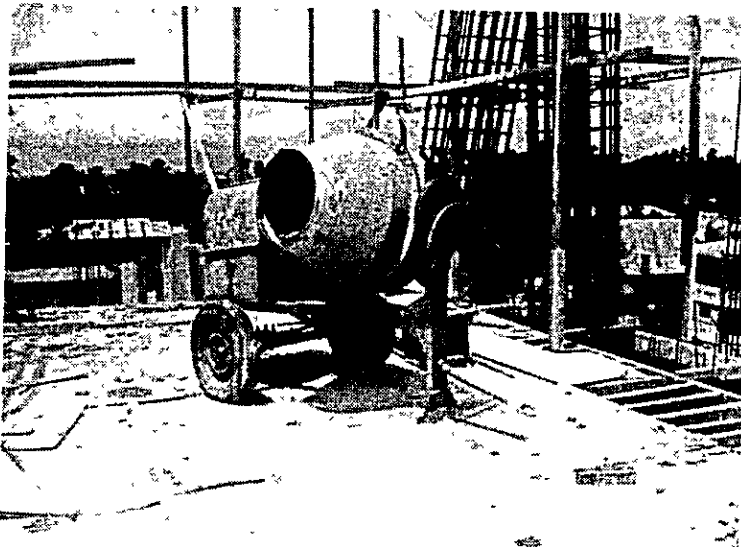
1. H. Franco Construction
2. Salazar Construction
3. Velez Construction
4. Regner Construction
5. N.J.P. Enterprise

(資料: MINISTRY OF PUBLIC WORKS & HIGHWAYS)

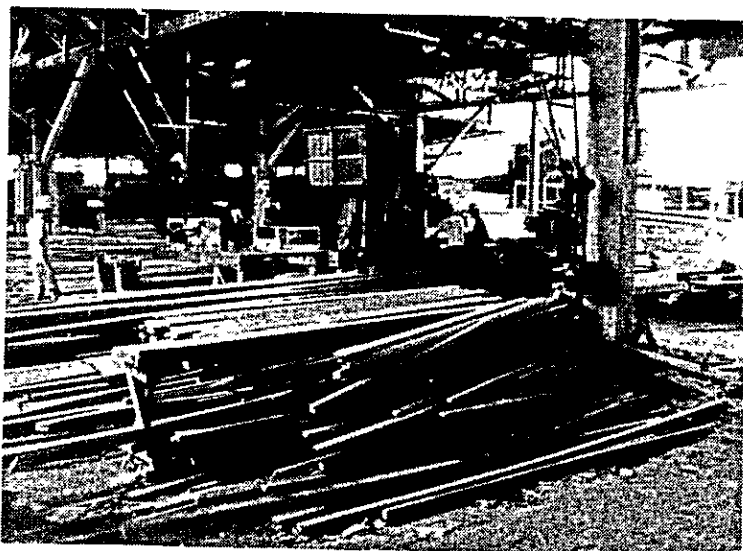
ボホールの建設工事状況



RC造型枠工事



コンクリートミキサー
現場練り



木材製材工場

建設工事の実態

フィリピン国における建物の傾向としては、中・低層が一般的であるが、最近では20階を超える銀行、事務所、ホテル等の高層建築物も多く見られる。これらの建物の殆んどは鉄筋コンクリート造で、鉄骨鉄筋コンクリート造は、鋼材が高価であることと、地震力が小さいことからあまり採用されていない。一方、低層の住宅や小規模な建物は、木造やコンクリート・ブロック造が一般的である。

今回、ボホール及びメトロマニラにおいて調査・散見した数ヶ所の工事現場の状況からまとめた建設工事の実態についてその概略を以下に記す。

(土・地業・杭工事)

堀削は小規模のものは人力に依存し、他はブルドーザー等の機械を使用する事が多い。通常、3～4階建程度の建物では、碎石地業を施した直接基礎形式が、それ以上の階数の場合には杭基礎が採用されている。杭はプレストレストコンクリート既成杭が多く、米国のUBCやAASHTO等の規格に準拠して製作され、杭打ちはディーゼル・ハンマー式の打込機にて行われている。

(鉄筋・コンクリート・型枠及びブロック工事)

鉄筋・セメントは自国生産されており、品質はASTMの規格仕様に基づいている。生コン(レディーミックスコンクリート)工場とバッチャープラントに依る現場練りがあり、スラブは5～10cmと硬練りである。尚、一般の建物の4週強度は210 kg/cm²で行っている。

ほとんどの型枠には合板型枠を角材サポートと組合わせ使用している。コンクリートブロックは、水廻りや遮音・耐火性を要する壁の下地として使用されている。

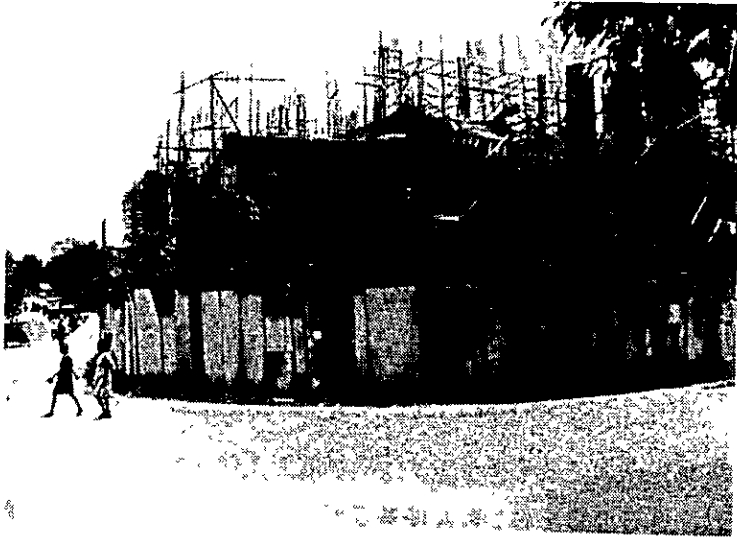
(屋根工事)

中・低層の建物で、鉄筋コンクリート造による場合でも木造の小屋組を用い、鉄板葺、スレート瓦葺、波型スレート葺が多く、屋根勾配もある程度の集中豪雨を考慮した勾配となっている。

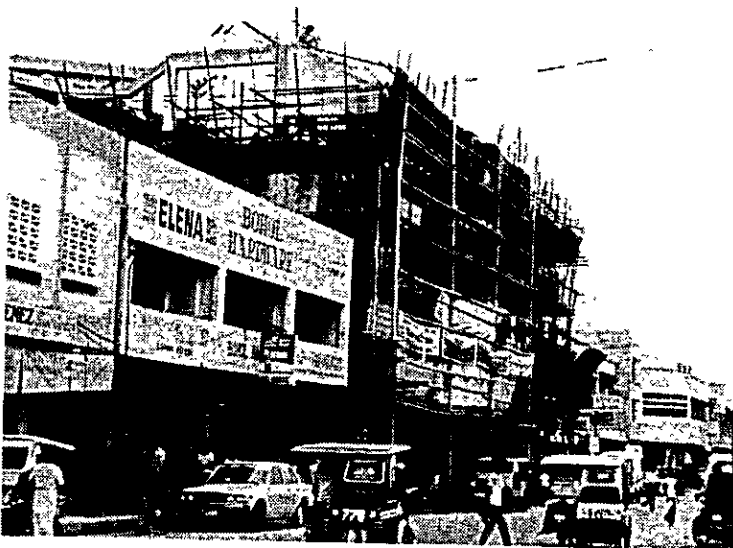
(内・外装工事)

床仕上材としてはビニール系タイルが一般的であるが、グレードの高い室は寄木貼を使用している。他に、ホール・通路部等は現場研テラゾーや小砂利の洗い出し仕上が多い。

建設現場（タグピララン市内）



ボホール大学増築状況



映画館と商店の複合建築



建設間もない高等学校

壁はモルタル塗にペイント仕上が一般的であるが、合板貼の木造間仕切壁も多い。天井については、下地は軽鉄が高価な事もあって木造下地とした緑甲板張や岩線吸音板が多く使用されている。

外装はコンクリート、又はコンクリートブロック下地にモルタル塗ペンキ仕上が最もオーソドックスで、少し上級なケースとしてはモルタルの骨材に種々の砂利・貝がらを混入して所り仕上を施したものの、又、大理石を細く砕いたものを混入し洗い出し仕上にしたものがある。

(設備・電気工事)

ダクト材としてはほとんどアルミニウムシートが使用されており亜鉛鉄板は非常に少ない。又、保温材はグラスウール系は輸入品で高価な為、スタイロフォーム系が使用されている。このため気密、断熱性が良くない。空調機器のうち自国生産しているのも若干あるが、品質的にもかなり劣るため、冷凍機、ボイラー、ポンプ、冷却塔、空調機等は外国製品に依存している。

衛生配管材について、汚水・雑排水管は塩ビ管や鋳鉄管を、給水管は亜鉛メッキ鋼管の使用が一般的であるが品質はあまり良くない。

電気では、電線管、配線・ケーブル類、盤類は現地生産品があり品質的にも充分使用できる。尚、盤内の各種パーツ類は日本製品が多く使用されている。又、照明器具関係は現地製もあるが、種類が限られている事もあって輸入品がかなり出回っている。

日本建設業者の活動

最近、フィリピン国における外国業者の活動がかなり制約されてきている事もあって、日本建設業者の活動は停滞気味である。

これは、フィリピン自体の建設投資が景気の停滞を背景に落込んでいる事が影響しているものと考えられる。

尚、1980年8月現在、現地日系法人設立会社(建設)は2社程あるが、本格的な活動となり得ていない模様である。

建設資材

建築用構造及び内装仕上材は一部を除いて自国で生産供給可能であり、特殊なものを除き現地産建材の使用に大きな問題はない。

建築建材以外の空調・衛生・給排水・電気等の設備機器及び一部の材料については自国での生産能力不足や品質的にも劣るため輸入の依存率が高い。

通常、輸入材に対する関税は、インボイス価格の110%に対して、商品により10～100%の範囲で課税される。尚、グラント工事等のNational Projectに係る輸入品については免税されている。

主な建設資・機材の関税率表(1982年10月)

1) セメント	50%
2) コールタール系樹脂材	10%
3) ペイント類	70%
4) ガラス製品	40%
5) 鉄筋	20%
6) 鉄骨	40%
7) ボルト・ナット数	20%
8) ポンプ類	30%
9) 家電製品	
A	60%
B	50%
C	50%
10) 乗用車	100%

以下に現地産の各建設資材の概要を記す。

1) コンクリート

セメントについては、ASTM仕様に基づいて普通ポルトランドセメントが生産され質・量とも問題はない。コンクリート用骨材としては粗骨材には砕石が、細骨材には川砂が用いられている。コンクリートの4週強度は $91 \text{ kg/cm}^2 \sim 310 \text{ kg/cm}^2$ 迄、いくつかに分かれている。尚、スランプは10cm程度と、硬練りコンクリートの使用が一般的である。

コンクリート製品のひとつにPC杭があり、角型タイプで $10'' \times 10'' \sim 18'' \times 18''$ まで

(2"単位)、長さ最大45'～59'まである。コンクリートブロックは100%、150%、200%厚で、大きさは200%×400%である。

2) 鋼材

鉄筋は、丸鋼・異形鉄筋いずれもあるが、建設工事に用いられているのは殆んどが異形鉄筋である。6%φ～32%φのものがあり、柱・梁主筋には比較的太径(25～32%φ)のものが使用されている。

鉄骨材もASTM規格で生産されているが、種類も少なく、生産不足もあって大部分は輸入に依存している。又、加工技術もS造、SRC造の建物が少ない事もあるためそのレベルは低い。

3) 木材

木材はフィリピンの輸出品の一つで、良質なものが生産されており、主な用途として、小規模な建物の構造材や、床のフローリング、寄木壁・天井の緑甲板等の内装仕上材や建具類に広く使用されている。材種はナラ、ラワン、アトピン、イビル、ヤカル、タンギール等がある。

合板材の規格サイズは4×8'で6mm、12mm、19mmの厚さがある。

4) 建具類

木製及び鉄製の建具は一般化されており、中に精度がやや落ちるものもあるが使用に差しかえない。しかし、アルミサッシはあまり普及しておらず、一部自国製もあるが殆んどを輸入に頼っている。

又、同様に附属金物も大半は、輸入品を利用している。

5) 内装・仕上材、その他

仕上材では、ビニール系タイル及びシート類、天井用吸音板類、メラミン化粧板等は、自国生産されており、種類が少なく、品質的に若干劣るが使用上差支えない。又、現地工法として、外壁のモルタル研り仕上や床のテラゾー研出し、小砂利の洗い出しがあり仕上がりもきれいである。其の他に自国生産されている資材としては、レンガ、セラミックタイル、屋根瓦、スレート板類、ガラス、亜鉛メッキ鉄板、一般塗料等がある。

資材運搬

本施設建設用資材は、メトロマニラを中心としたフィリピン国内から調達される他、日本からの輸入によりまかなわれる。

1) 日本から輸送される資機材のルート

日本の横浜或いは神戸港から海上運搬でマニラ港まで直行便の場合約7から10日間要する。マニラ港(South Harbor)到着後、荷上げ、通関手続を行い、国内船専用のNorth Harbor迄トラック輸送し、タグビララン行の船にローディングされる。日数は早くて1週間と予想される。以上より日本出港後建設現場到着迄の所要日数は3~4週間を見込む必要がある。

建設工期は日本からの輸入材の輸送日程に大きく影響されるため、日本生産品の発注、輸出工程等十分に検討し対処する事はもちろんのこと、特にフィリピン側での通関手続・手配については、関係機関と十分な打合せが必要である。

2) 輸送諸費用

日本から建設現場迄の資機材の輸送に必要な諸掛りは、1982年10月現在で下記の様である。

(1) 梱包費	(一般)	3,500円/KT
	(機器)	11,000円/M ³
(2) シッピングチャージ	(倉庫料含)	2,800円/RT
(3) 海上輸送費	(日本~マニラ)	17,000円/M ³
	(マニラ~タグビララン)	5,000円/RT
(4) 同上輸送に於けるマニラ港での荷上・積み替え料		6,200円/RT

労務事情

全人口に占める労働人口（15歳以上）の比率が56%と高く、就業者数は約1,800万人近くいる（このうちの約半数が農林・水産業従事者）が、全体的に労働力の供給は過剰気味である。

このため労働力は比較的安く容易に調達できるため、機械力にたよらず人力を利用する方が経済的である。

昨今の中近東方面における建設ラッシュの影響や政府の人的輸出奨励等により、海外へ流出する労働者が増えてきている。

建設労働者の職種は、土工、大工、コンクリート工、鉄筋工、左官工（ブロック・レンガ・タイル工を兼ねる）、塗装工、溶接工、配管工、電気工、重機オペレーター、人夫等に分類され各々の技能ランクに応じて賃金体系ができています。適切な指示と作業の段取り・調整さえできていれば比較的よく働く。

下表に、MPWH（公共事業省）にて調べたボホールにおける標準的な労務費の例を示す。

（1982年10月現在、ペソ/日・8時間）

職 種	A	B
鉄 筋 工	25	20
溶 接 工	25	20
木 工 ・ 大 工	25	20
コ ン ク リ ー ト 工	25	20
配 管 工	25	20
電 気 工	25	20
土 工	20	18
職 長	30	
オ ペ レ ー タ ー	26 ~ 28	
運 転 手	20 ~ 25	

（注）1） Aは熟練工を、Bは未熟練工を示す。

2） 本表には生活手当等の諸手当は含まれていない。

主要建設資材単価表

(単位：円、但し1ペソ=30円)

資材名	単位	フィリピン			日本
		マニラ	セブ	タグビララン	
砂 利	m ³	—	1,650	3,000	3,200
砂	"	—	1,650	2,700	3,300
セメント	Ton	—	27,750	1,080/bag	13,800
鉄筋(材)	"	126,000	1,800/pcs	180,000	61,000
コンクリート・ブロック					
⑦ 100mm	m ²	2,050	(材)490	(材)720	3,700
⑦ 150mm	"	2,110	(材)580	(材)970	4,100
100角タイル	"	5,000	—	5,400	7,200
ベニヤ合板		—			
1/4" 4'×8'	枚	—	1,800	1,600	1,500
1/2" "	"	—	3,300	—	2,500
3/4" "	"	—	4,350	—	5,500
硝子(透明普通板)					
5%	m ²	5,490	—	—	6,000
塗装(EP)	"	540	(材)2,000/gal	(材)2,000/gal	900
" (VP)	"	1,200	(材)2,400/gal	(材)2,850/gal	950
PVCタイル	"	2,760	—	—	1,500
モザイクパーケート	"	(材)4,200	—	—	6,400
アスベスト・セメント板(ACB)	"	1,140	—	—	2,200
亜鉛鍍鉄板	"	1,200	2,000/sht	180/linft	

(1982年10月、MPWH資料による)

建設コスト

1) 建設単価

建設単価について、政府で一定化制定したものはないが、参考としてポホールにおける平均的な建設費の概算目安としては次の通りである。

a. 病院・研究施設	1,000～1,500 ペソ/m ²
b. 一般事務所建築等	1,000～1,200 ペソ/m ²
c. 学校建築、寮等	800～1,000 ペソ/m ²

尚、上記単価は建築工事のみで設備、電気等の附帯工事費は含まれていない。

2) 建設資材単価

フィリピン国で入手できる主な建設資材の単価は、MPWH(公共事業省)のデータによると別表の通りである。

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