No.

フィリピン共和国パーティクルボード開発技術協力事業エバリュエーションチーム報告書

1982年3月

国　際　協　力　事　業　団

フィリピン共和国パーティクルボード開発技術協力事業エバリュエーションチーム報告書

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はじめに

日本国政府は，技術協力の一環として，フィリピン共和国政府の要請にこたえ，１９７７年３月以来，「パーティクルボード開発技術協力事業」に関する合意議事録（R／D）に基づき，フィリピン共和国におけるパーティクルボード開発技術の向上のため技術協力を行ってきたが，本年１月３１日をもって約４年１０カ月の協力を終了することに伴い，エバリュエーションチームを派遣した。

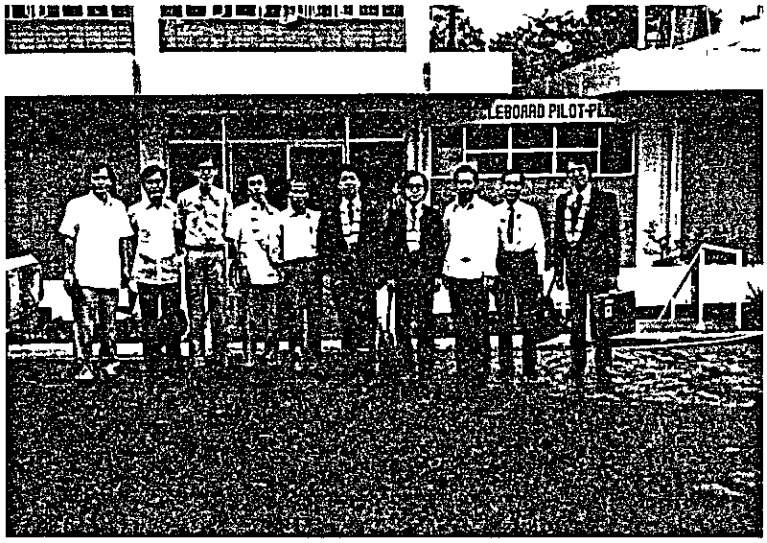
本報告書は，上記エバリュエーションチームが当初協力目標の達成度等について，フィリピン側の協力受入れ機関である林産物開発研究所（FORPRIDECOM）と協力し調査した結果をまとめたものである。

本件協力のために日夜御尽力された専門家各位に対し，この機会を借りて心からのねぎらいと，感謝の意を表する次第である。

また，本件協力遂行に多大の御協力を頂いた外務省，通商産業省，岩倉組木材㈱並びに本チーム派遣に際しご協力いただいた現地日本大使館の方々に深甚なる謝意を表するものである。

１９８２年３月

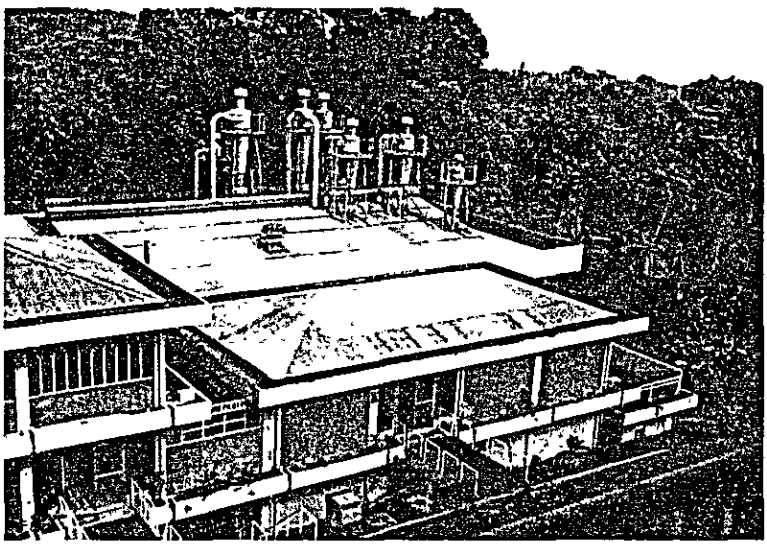
国際協力事業団
鉱工業開発協力部
部長　岡藤栄助



エバリュエーションチームと関係者

左から，竹本調整員，元木プロジェクトリーダー，中川団員
小形団員，Pablo 比側プロジェクトリーダー，岡藤団長，脇
本団員，Valbuena コミッショナー，後藤田団員，笠原団員

Joint Evaluation Report の署名
左・Valbuena　FORPRIDECOM コミッショナー
右・岡藤エバリュエーションチーム団長



ハイロットプラント全景

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Ⅰ　エバリュエーションチーム派遣の経緯と目的

1．派遣の経緯

本件事業の協力経過は以下の通りである。

(1)　技術協力の要請と事前調査団の派遣

昭和５１（′７６）年２月２４日付公信第２２７号により，本プロジェクトに係る技術協力の要請がフィリピン政府よりあり，これを受けて，同５１年４月に，(イ)廃材等の原材料の現状，(ロ)技術移転の可能性，(ハ)工業化の可能性等について事前調査を実施した。

(2)　長期調査員の派遣

昭和５２（′７７）年１月から３月にかけて長期調査員を派遣し，事前調査内容の詳細検討及び技術協力（技術移転）実施案の策定に資する素材の収集を行った。

(3)　実施調査団の派遣

上記事前調査及び長期調査員の調査内容を前提として，本件技術協力を実施するために昭和５２（′７７）年３月に実施調査団を派遣し，フィリピン側の技術協力に関するニーズ及び日本側の技術協力実施策についてそれぞれ討議を重ね，同年３月１８日に本プロジェクトに関する合意議事録（R／D）の署名及び交換を行った。

(4)　計画打合せチームの派遣

上記調査の成果を踏まえて，昭和５２（′７７）年８月から９月にかけて計画打合せチームを派遣し，本プロジェクトの本格的な技術移転を円滑に実施するための細目をフィリピン側当局者と協議した。

(5)　第１次巡回指導チームの派遣

昭和５４（′７９）年１０月に第１次巡回指導チームを派遣し，現地指導及び年次実施計画を作成した。

(6)　第２次巡回指導チームの派遣

引き続き昭和５６（′８１）年１月から２月にかけて第２次巡回指導チームを派遣した。本チームはプラントの開所式にも出席した。

(7)　研修員の受入れ

フィリピン側カウンターパートの受入れは，昭和５１（′７６）年より開始され同５６年末までにのべ２０名が本邦において視察及び研修を行った。

(8)　日本人専門家の派遣

日本人専門家の派遣についても同５１年より開始され，同５６年末までに短期，長期あわせて延べ２７名が派遣された。

(9)　機材の供与

フィリピン側はパイロットプラント用の建屋の建設を開始したのに伴い，日本側は昭和５２年よりパーティクルボード製造パイロットプラント他の機材供与を実施した。

(10) パイロットプラントの引き渡し

日本側供与のパイロットプラントの据付は，昭和５５年１２月末までに終了し，同５６年１月３０日に開所，引き渡し式を行いフィリピン側にプラントを引き渡した。

なお，本件協力事業の枠組は以下の通りである。

事　　項	内　　容
協力目的	パーティクルボード製造用一貫性パイロットプラントを供与し，これを使用して良質のパーティクルボード製造技術の移転を行うこと。
協力方針	(i) パーティクルボード研究開発の促進 (ii) 人材の構成 (iii) 既存企業に対する現場指導
協力形態	日本人専門家の派遣 フィリピン研修員の受入れ パイロット・プラントの機材供与
協力期間	＜当初R/D＞ 昭和５２年３月１８日から昭和５５年３月１７日まで ＜R/D 延長期間＞ 昭和５５年３月１８日から昭和５７年１月３１日まで ＜フォローアップ期間＞ 昭和５７年２月１日から昭和５８年３月３１日まで
協力相手機関	国家科学開発庁林産物開発研究所 （FORPRIDECOM*, NSDB**）

＊FORPRIDECOM－

Forest Products Research and Industries Development Commission

＊＊NSDB－

National Science Development Board

2．派遣の目的

(1) 当初協力目的に沿って，その具体的項目の達成度についてフィリピン側関係者及び日本人専門家との協議を中心とした実績調査と評価を行うこと。

(2) パイロットプラントの運転状況及びフィリピン側カウンターパートの技術習得度と相手側の技術移転チームの編成等の調査と評価を行うこと。

(3) 今後に残された課題と２次加工問題も含めフォローアップ等による協力の継続の必要性についてフィリピン側と協議すること。

3．チームの構成と日程

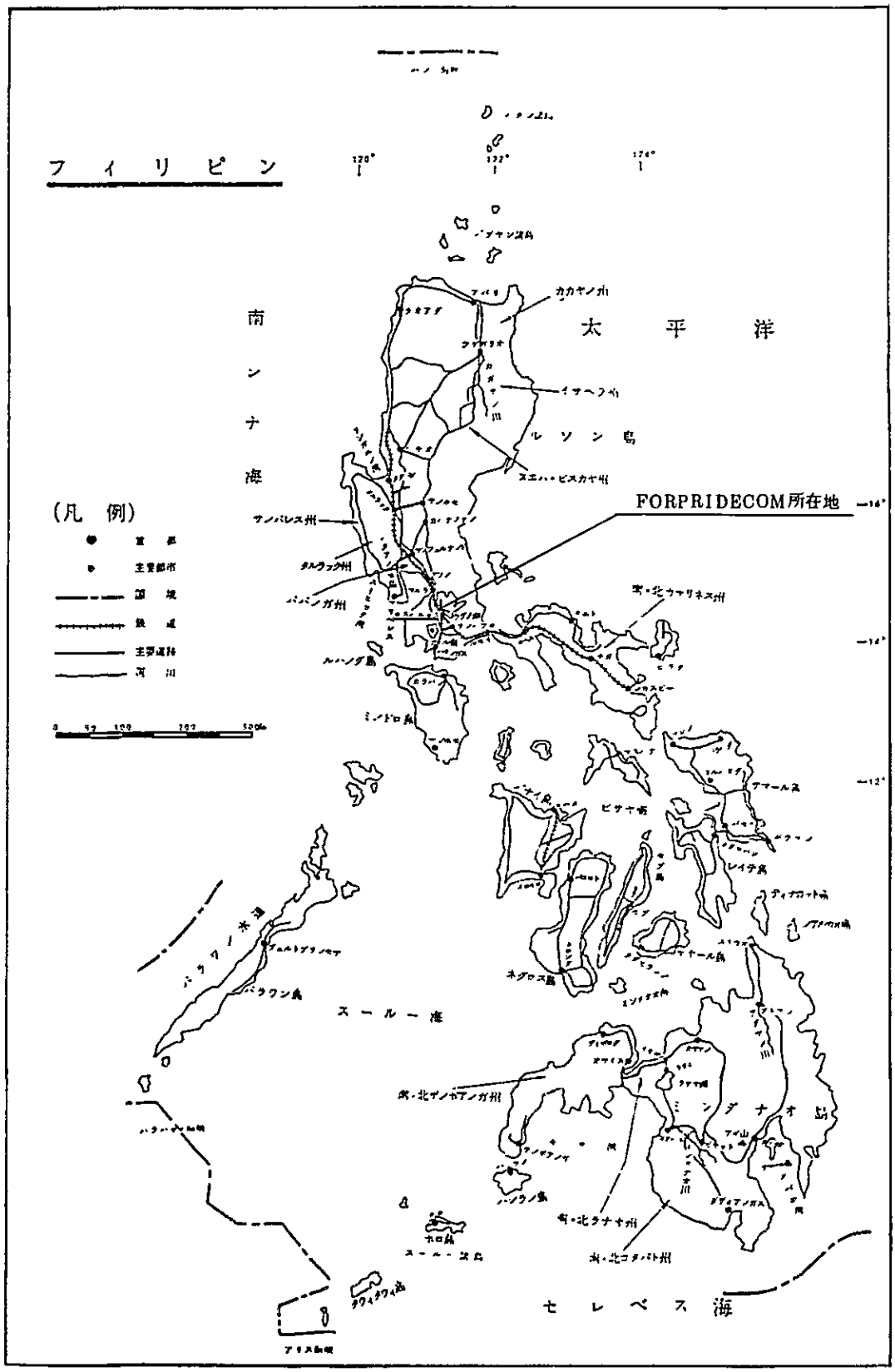
－チームの構成－

氏　　名	担当業務	所　　属　　先
岡藤栄助	団長（総括）	国際協力事業団鉱工業開発協力部長
後藤田正夫	接着技術	日本原子力研究所嘱託
脇本真也	プロジェクト運営	通商産業省生活産業局窯業建材課
小形厚博	製造技術	岩倉組木材㈱プラント部
中川和夫	業務調整	国際協力事業団鉱工業開発技術課

本件チームには国際協力事業団の技術協力評価委員会の関連業務のため当事業団企画課笠原秀昭職員が全期間同行した。

－日　程－

順日	月　日(曜)	業　　務　　内　　容
1	１０／２４(土)	東京→マニラ（移動日）
2	２５(日)	日本側関係者との事前打合せ
3	２６(月)	日本大使館表敬訪問，ＪＩＣＡ事務所と打合せ ＮＳＤＢ表敬訪問
4	２７(火)	
5	２８(水)	ＦＯＲＰＲＩＤＥＣＯＭと協議及びエバリュエーション調査
6	２９(木)	
7	３０(金)	Ｊｏｉｎｔ Ｅｖａｌｕａｔｉｏｎ Ｒｅｐｏｒｔの署名交換
8	３１(土)	資料整理
9	１１／　１(日)	
１０	２(月)	関連施設の視察
１１	３(火)	
１２	４(水)	ＦＯＲＰＲＩＤＥＣＯＭと最終協議
１３	５(木)	日本大使館及びＪＩＣＡ事務所に報告
１４	６(金)	マニラ→東京（移動日）


フィリピン
南シナ海
太平洋
ルソン島
FORPRIDECOM所在地
(凡 例)
首都
主要都市
国境
鉄道
主要道路
河川
サンバレス州
タルラック州
パンパンガ州
ルバング島
ミンドロ島
ビサヤ諸島
レイテ島
ネグロス島
スールー海
パラワン島
ミンダナオ島
セレベス海

Ⅱ　エバリュエーション調査結果

1．エバリュエーション関係者

(1)　日本側

- ○元木英生プロジェクトリーダー
- ○藤原邦彦専門家（製造管理）
- ○山腰一博　〃　（品質　〃　）
- ○三浦敏一ＪＩＣＡマニラ事務所長
- ○中村三樹男ＪＩＣＡマニラ事務所員
- ○ＪＩＣＡエバリュエーションチーム

(2)　フィリピン側

- ○R，Valbuena FORPRIDECOM コミッショナー　他スタッフ５名
- ○A，Pablo FORPRIDECOM プロジェクト　リーダー他カウンターパート７名

(3)　フィリピン側関係機関

全体討議には下記の機関より関係者が出席した。

- ○E．Ramos－NSDB（国家科学開発庁－FORPRIDECOMの上部機関）
- ○L．Aggubao 他３名　　財務省
- ○S．Miranda 他１名　　NEDA（経済開発庁）

2．エバリュエーションの方法

(1)　上記１，の関係者による①全体討議，②パイロットプラントにおけるパーティクルボードの試作，③作業グループ（日本側はエバリュエーションチームの中川及び笠原，フィリピン側はPabloリーダ他カウンターパート３名）による詳細討議，及び④Joint Evaluation Report の作成作業を通じてエバリュエーションを行った。

(2)　具体的にはエバリュエーションは以下のような手法で行った。

a　時系列的計画達成度（ハード面）の評価

(a)　当初計画と実績上の時間的ズレ

計画＼年度		昭和54('79)年	55('80)年	56('81)年	57('82)年
(A)	計画	←----→			
	実績	←——→			
(B)	計画		←----→		
	実績		←——→		
(C)	計画			←----→	
	実績			←——→	

- Joint Evaluation Report（別添資料Ⅰ）のAnnex J〝Implementation Schedule of Technical Cooperation ……〟

(b) 上記(a)の計画と実績が時間的にズレた理由

(c) 対処方法とその結果

尚，当初協力期間は，昭和５５年３月１８日に約１年１０カ月（昭和５７年１月３１日まで）延長されたが，その延長の決定の際にフィリピン側の建物建設の遅れなど一応の中間的評価を行っている。

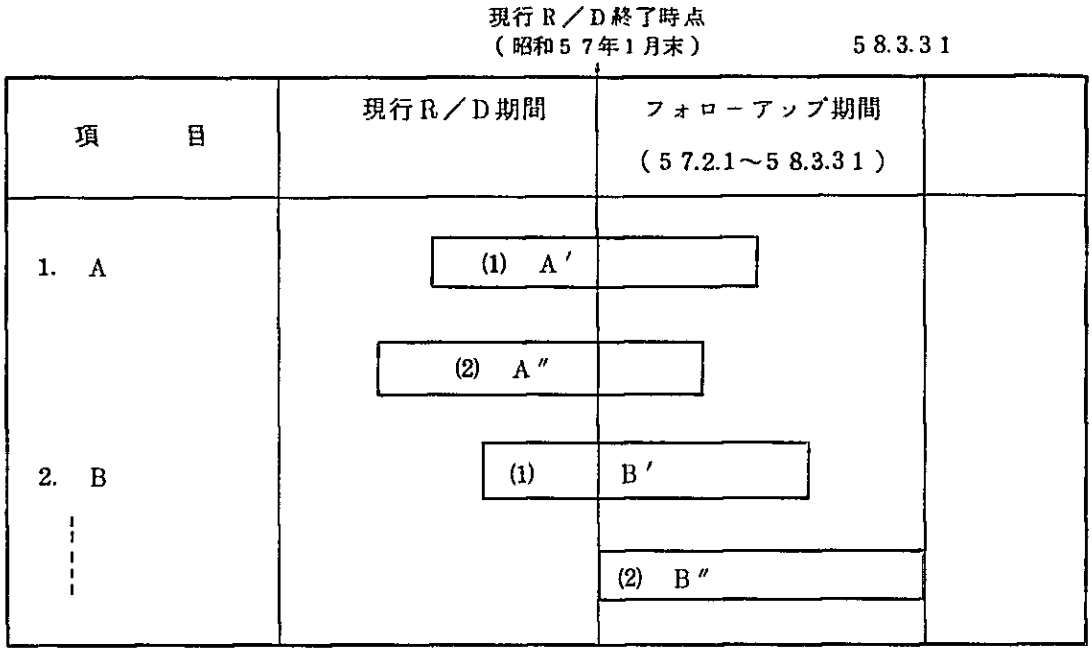
従って，今回のエバリュエーションは，延長R/D 署名時に計画された実施計画に基づいて行うこととした。

b. 協力内容の量的達成度（ハード面）の評価

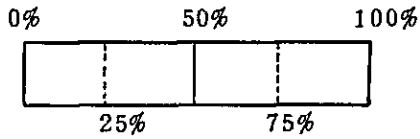
プラントの建屋，予算，パイロットプラント，専門家派遣，研修員の受入れ，その他〝Joint Evalution ReportのAnnex A～F〟

C. 試験，研究，開発目標における計画達成度（ソフト面）の評価

ソフト面の評価はハード面のように単純に〝時間的ズレ〟と〝量的評価〟のみで適確な評価を行うことが困難であるため，下記の方法によった。



〝Joint Evaluation Report の Annex K〟



＜例＞

(1) A′ の場合は現行R／D終了時点で達成度５０％を示す

(2) A″　〃　〃　７５％　〃

(1) B′　〃　〃　２５％　〃

(2) B″　〃　〃　０％　〃

3. エバリュエーション結果

(1) 実施概要

本プロジェクトの実施概要は以下の通りである。

実施状況						
協力形態＼年度	５１年度	５２年度	５３年度	５４年度	５５年度	５６年度
調査団派遣	事前調査（51／4） 実施調査（52／3）	計画打合せ（52／8）		第１次巡回指導（54／10）	第２次巡回指導（56／1）	エバリュエーション（56／10）
専門家派遣	長期調査員 ２名	短期 ３名	長期調査員 １名 短期 １名	短期 ７名	長期 ２名 短期 ９名	長期 ２名（継続） 短期 ２名
研修員受入	高級 １名 一般 １名	一般 ２名	準高級１名 一般 ５名	高級 １名 一般 ３名	一般 ３名	準高級２名 一般 １名
機材供与	0	7,011千円	71,002千円	160,936千円	102938千円	

詳細については表－１参照。

(2) エバリュエーション結果（要旨）

上記，エバリュエーション方法によって得た結果は要旨次の通りである。

（詳細については，別添資料のⅠ〝Joint Evaluation Report〟－以下〝Report〟と略す－参照）

a. R／Dの延長時点（昭和５５年３月１８日）から，調査時点までの〝Study Program〟を除く，他の協力内容（フィリピン側の基礎工事及び建物建設等，日本人専門家派遣，カウンターパートの受入れ，調査団派遣，ならびに機材供与）の，「時系列的」及び「数量的」実施状況はほぼ計画通り，実施されたことが判明した（Report-Annex J Implementation Schedule）。

b. 〝Study Program〟については，各研究項目が，R／D終了時（昭和５７年1月31日）には平均すると５０％程度の達成率になることが予想された（Report-Annex K Study Program Implementation）。

C. 上記Study Programが５０％程度しか達成されない原因は，電力，水等のインフラの問題が当初の予想を上回って悪化したためである。

電力についていえば，FORPRIDECOM周辺の電力消費が急増し，電力供給量を越

表－1　フィリピン・パーティクルボード開発技術協力プロジェクト実績表

予算年度	51(1976) 4 5 6	7 8 9	10 11 12	1 2 3	52(1977) 4 5 6	7 8 9	10 11 12	1 2 3	53(1978) 4 5 6	7 8 9	10 11 12	1 2 3	54(1979) 4 5 6	7 8 9	10 11 12	1 2 3	55(1980) 4 5 6	7 8 9	10 11 12	1 2 3	56(1981) 4 5 6	7 8 9	10 11 12	1 2 3	備考
据付準備（フィリピン側） ・機材搬入用道路 ・機械基礎工事								当初計画																	パイロットプラント工場当初計画より1年の遅れ
日本人専門家派遣			長期調査員（2名）			短期専門家（2名）		短期専門家（1名）			長期調査員（1名） 短期専門家（1名）		短期専門家（3名）	短期専門家（1名）	(3)短期専門家（1名）		短期専門家（1名） 短期専門家（1名）			長期専門家（2名）	短期専門家（4名） 短期専門家（2名）		短期専門家（1名）		・長期調査員 3名 ・短期専門家 22名 ・長期専門家 2名
フィリピン研修員受入れ			プロジェクト管理者（2名）			研修員（2名）		プロジェクト管理者（1名）	研修員（5名）		プロジェクト管理者（1名）	研修員（3名）				研修員（3名）				短期専門家（1名） プロジェクト管理者（2名） 研修員（1名）				研修員 20名
調査団派遣	事前調査団			実施調査団		計画打合せチーム						第1次巡回指導チーム				第2次巡回指導チーム							エンジニーションチーム		
機材（日本側準備）(1) 昭52年度機材供与						船積 (7,011千円)																			(1)～(4) 日本側供与機材総計 341,887千円 (5) その他携行材料 総計 8,818千円
(2) 昭53年度機材供与										船積 (63,248千円)		船積 (7,754千円)													
(3) 昭54年度機材供与														船積 (160,936千円)											
(4) 昭55年度機材供与																		船積 (102,938千円)							
(5) その他携行機材						(1,401千円)				(698千円)				(2,677千円)				(1,542千円)				(2,500千円)			

えてしまった結果，毎日，数時間の計画停電（それもプラントの運転に支障のある昼間不定期に）が行われている。

水についてはFORPRIDECOMの地下水揚水ポンプが破損したためであった。

従って，昭和５６年１月にフィリピン側へ引渡されたパイロットプラントは殆んど運転出来なかったため試験，研究及び開発に必要な各種データーの収集が不充分であったために達成度が低くなった。

Ⅲ　協力期間の延長と実施計画

エバリュエーションチームとフィリピン側は以上のエバリュエーション結果より，プロジェクトの当初目標を達成するには，R／D終了後も引き続き協力の継続が必要であるとの合意に達した。そしてReportの中で両者は両国政府に対し，その必要性を〝Recommend〃することとなった。

また，協力延長等についてチームとフィリピン側との間で合意した。実施計画は次のとおりである。

1．協力延長の形態

いわゆる〝フォローアップ〃として協力を継続する（R／Dの再延長はしない）。

2．協力延長期間

昭和５７（′８２）年２月１日から

昭和５８（′８３）年３月３１日まで（１年２カ月間）

3．協力分野

「協力分野」については，フィリピン側より，２次加工等も加えてほしい旨の要望が出されたが，わが方としては，協力の延長は「当初計画分野中で達成出来なかった部分」の実施のために行われるものであるとの観点から，上記フィリピン側の要望は取りあげないこととした。

4．実施計画

（Report-Annex·L-Tentative Implementation Schedule 参照）

(1)　専門家派遣

a　長期専門家－１名ないし２名を派遣するが，内１名を岩倉組木材㈱所属とする。

ただし，当該専門家がプラントの保守管理を担当出来る専門家であれば短期のメンテナンス専門家（２名）は派遣しない。

（Annex·L·2·Despatch of Experts の a．b．）

b　短期専門家－プラントのメンテナンス専門家（機械及び電気各２名）を派遣。４名とも岩倉組木材㈱所属とする。

（Annex·L·2·Despatch of Experts の b，c．）

品質管理専門家（２名－同社所属）及び製品開発専門家（１名）を派遣する，

（Annex·L·2·Despatch of Experts の d，e）

(2) 研修員の受入れ

プラントのメンテナンス（機械及び電気各１名）及び工程管理（１名）計３名をそれぞれ６カ月間受入れる。

（Annex·L·3·Counterpart Training の a～c）

Ⅳ　エバリュエーションチームの提言

本プロジェクトのフォローアップについては，Reportの中で両者が両国政府に対し，このことを〝Recommend〞することにより実施されることとなった。

上述の通り，現在まではプラントの運転が充分でなかったことにより，品質管理，Cost Study 等，市場性のあるパーティクルボード開発の重要分野が殆んど実施されていなかった。

しかしながら，フィリピン側は，新年度予算（５７.１.１～５７.１２.３１）で水不足を根本的に解消するための深井戸建設経費を確保（Report Annex F）し，また，現在のパーティクルボード課を「部」に昇格させ人員配置の面からもより一層強力に取り組もうとしている（Report Annex Ⅰ）。

パイロットプラントそれ自体は，昭和５６年１月の引き渡し後，電気系統，フォーミング工程及びホットプレスに改良，調整を必要としたが，現在，その障害は取り除かれ，順調に運転されている。

チーム訪問時に試作された数１０枚のパーティクルボードは，満足の出来る良質の板であった。

フィリピン側に対しては，より市場性のあるパーティクルボードの開発努力を勧奨するとともに，わが方においてもフォローアップ期間中に充分な成果が上げられるよう全面的な支援を行う必要がある。

資　　料

Ⅰ　Joint Evaluation Report

Ⅱ　協力事業実績

Ⅲ　関連写真

資　　料　　I

(Joint　Evaluation　Report)

JOINT EVALUATION REPORT

BY THE

EVALUATION TEAM OF

THE JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

AND

THE FOREST PRODUCTS RESEARCH AND INDUSTRIES DEVELOPMENT COMMISSION,

(FORPRIDECOM)

NATIONAL SCIENCE DEVELOPMENT BOARD (NSDB)

ON THE

TECHNICAL COOPERATION PROJECT FOR THE

TECHNOLOGICAL DEVELOPMENT OF PARTICLEBOARD

IN THE REPUBLIC OF THE PHILIPPINES

OCTOBER 30, 1981

COLLEGE, LAGUNA 3720, PHILIPPINES

Discussion paper between the evaluation team of the Japan International Cooperation Agency (JICA) and the Forest Products Research and Industries Development Commission (FORPRIDECOM), National Science Development Board (NSDB) on the evaluation of the Technical Cooperation Project for the Technological Development of Particleboard, which is terminated on January 31, 1982

Date: October 26 - October 30, 1981

Place: Forest Products Research and Industries Development Commission

Attendance:

JAPANESE PANEL

Japanese Evaluation Team

Mr. Eisuke Okafuji	-	Team Leader, Director, Mining and Industrial Development Cooperation Dept., JICA
Dr. Masao Gotoda	-	Member (Adhesive Technology) Advisor (Japan Atomic Energy Research Institute
Mr. Shinya Wakimoto	-	Member (Project Management) Section Chief, Ceramics and Construction Materials Div., Ministry of International Trade and Industry
Mr. Hiromoto Ogata	-	Member (Production Technology) Head, Electrical Div., Iwakura-Gumi Lumber Co., Ltd.
Mr. Kazuo Nakagawa	-	Coordinator Mining and Industrial Development Cooperation Dept., JICA
Mr. Hideaki Kasahara	-	Member (Technical Cooperation Evaluation) Planning Dept., JICA

JICA Manila Office

Mr. Toshikazu Miura	-	Resident Representative
Mr. Mikio Nakamura	-	Deputy Resident Representative

FORPRIDECOM Japanese Experts

Mr. Hideo Motoki	-	Chief Advisor
Mr. Kunihiko Fujiwara	-	Production Management
Mr. Kazuhiro Yamakoshi	-	Quality Control
Mr. Setsuo Takemoto	-	Resident Project Coordinator

PHILIPPINE PANEL

Forest Products Research and Industries Development Commission

FORPRIDECOM Staff

For. Rodrigo R. Valbuena	-	Commissioner
Dr. Faustino C. Francia	-	Deputy Commissioner
Mr. Jaime O. Escolano	-	OIC, FPRC
Mr. Ramon P. Saraos	-	Chief, DOD
Mr. Vicente R. Tagle, Jr.	-	Chief, PPD
Mr. Resty B. Dimasapit	-	Budget Officer

Philippine Counterparts

Mr. Arturo A. Pablo	-	Project Leader
Ms. Necitas C. Generalla	-	Asst. Project Leader
Mr. Orlando R. Pulido	-	Researcher
Mr. Vicente C. Mallari, Jr.	-	Researcher
Ms. Erlinda A. Lajara	-	Researcher
Mrs. Juliet S. Aguinaldo	-	Researcher
Ms. Luisa S. Cañadido	-	Researcher
Mr. Felix V. Eusebio	-	Maintenance Supervisor

National Science Development Board

Ms. Euleta B. Ramos	-	Sr. Planning Officer

Ministry of the Budget

Ms. Ma. Luz Aggubao	-	Budget Analyst Budget Operations Office
Ms. Edna A. Rivera	-	Budget Specialist Budget Technical Service
Ms. Diwata G. Sanvictores	-	Sr. Management Specialist Management Office
Ms. Katherina C. Dimacali	-	Sr. Management Specialist Management Office

National Economic Development Authority

Ms. Socorro A. Miranda	-	Economic Development Specialist Industry and Utilities Staff
Ms. Elvira D. Moncayo	-	Economic Development Researcher Agriculture Staff

EVALUATION REPORT

I. INTRODUCTION

1. Objective

The Japanese Evaluation Team organized by the Japan International Cooperation Agency (JICA), (hereinafter referred to as "THE TEAM"), headed by Mr. Eisuke Okafuji, visited the Republic of the Philippines from October 24 to November 6, 1981, for the purpose of identifying past achievements and future prospects of the Japan-Republic of the Philippines Cooperation Project on the Technological Development of Particleboard, by virtue of the R/D* which took effect March 18, 1977 until January 31, 1982.

The team discussed and studied with the Philippine counterparts concerned, FORPRIDECOM personnel, and FORPRIDECOM Japanese experts, a number of aspects with respect to the performance of commitments, achievements of FORPRIDECOM's functions, constraints which hampered past activities, and possible causes which may restrain future prospects as well.

After careful studies and discussions, the Team summarized its findings and observations, as described in the following chapters.

*Record of Discussions between the Japanese Implementation Survey Team of the Japan International Cooperation Agency and the Forest Products Research and Industries Development Commission, NSDB signed on March 18, 1977.

2. Background of the Project

In 1976, the Government of the Republic of the Philippines requested the Government of Japan a cooperation on the Technological Development of Particleboard for low-cost housing construction and promotion in the Philippines.

Upon this request, the Government of Japan through the JICA, sent the Preliminary Survey Team to the Philippines from April 18, to May 8, 1976.

The Preliminary Survey Team conducted survey, studies and discussions with the concerned organizations of the Philippines.

On the basis of this report and recommendations of the Preliminary Survey Team, the Japanese Implementation Survey Team organized by JICA visited the Philippines from March 7 to March 21, 1977, for the purpose of working out the details of the Technical Cooperation Program on the Technological Development of Particleboard.

The Team discussed and studied with its Philippine counterparts a number of points concerning the Project for its effective implementation and management.

After careful studies and discussions, both parties agreed to recommend to their respective governments, the immediate implementation of the Project, as described in the R/D signed on March 18, 1977 between the Head of the Japanese Implementation Survey Team, the Chairman of NSDB, and the Commissioner of FORPRIDECOM. (This Record of Discussions has been extended from March 18, 1980 to January 31, 1982.)

This recommendation was accepted in principle by both governments and as a result, the cooperation program was started.

3. Summary of the Project

The summarized record of implementation of the technical cooperation program is as listed below:

Chronological Review of the Project

Year	Items
1976	1. Preparation and submission of project proposal
	2. Preparation and design of buildings
	3. Provision of laboratory equipment by JICA
	4. Despatch of JICA Preliminary Survey Team
	5. Consultation on the Project in Japan
1977	1. Provision of laboratory equipment
	2. Despatch of JICA Implementation Survey Team
	3. The Record of Discussions was signed
	4. Despatch of JICA Consultation Team
	5. Counterparts Training in Japan
	6. Despatch of short-term Japanese Experts
1978	1. Despatch of short-term Japanese experts
	2. Design and lay-out of machines
	3. Counterparts training in Japan
	4. First provision of pilot plant equipment
1979	1. Construction and completion of buildings
	2. Second provision of pilot plant equipment
	3. Despatch of JICA Technical Advisory Team
	4. Despatch of short-term Japanese experts
	5. Counterparts Training in Japan
	6. Installation of first batch (1978) equipment
	7. Conducted studies on raw materials

1980

1. Third provision of pilot plant equipment
2. Installation of machineries
3. Despatch of short-term Japanese experts
4. Counterparts training in Japan
5. Test runs of the pilot plant with counterparts and experts
6. Continued studies on raw materials
7. Preparation of operation manual of each processing machine

1981

1. Despatch of JICA Technical Guidance Team
2. Despatch of long-term Japanese experts
3. Inauguration and Turn-Over Ceremonies of the Particleboard Pilot Plant
4. Despatch of short-term Japanese experts
5. Drafting of some plant standards
6. Counterparts training in Japan
7. Despatch of JICA Technical Evaluation Team

Note : Details on the above subject matters are shown in annexes B to E.

II. METHODOLOGY OF EVALUATION

1. Materials Used as Reference

In order to evaluate past performance and achievement quantitatively as well as qualitatively, the following materials are adopted as references:

(i) The R/D

(ii) The official request made by the Philippine Government with respect to expert services, training of counterparts in Japan and donation of equipment by means of Colombo Plan Forms A-1, A-2, A-3, and A-4, respectively.

(iii) The minutes of meeting and the annual work plan agreed or accepted in the course of implementation of the Project.

(iv) The status report on the Project by FORPRIDECOM.

And the Team also conducted inspections on building, facilities, utilities in cooperation with the FORPRIDECOM staff, Japanese experts, and representatives from other government agencies concerned.

Discussions were also held with the FORPRIDECOM Counterparts previously trained in Japan on the efficiency of training.

III. RESULT OF EVALUATION

1. Buildings and Facilities

(Plans and Performance)

i. Buildings and facilities worth ₱1,977,937 were constructed by the Philippine side for the Project. These are the pilot plant building and electrical house, researcher's office and testing laboratory, annex office and chemical laboratory, and 3 units of consultant houses.

ii. In addition, the following infrastructures worth ₱819,708 are either being constructed or scheduled for construction; asphalting of access roads to the pilot plant, storage for raw materials and finished products, and the 4th unit of consultant houses, including driveway and fence.

(Comments)

i. Some delays were encountered in the construction of buildings and infrastructures due mainly to budgetary considerations. However, these did not greatly affect other activities.

ii. Facilities and utilities need further improvement. Some of the urgent needs are:

a. Water supply - Frequent water supply interruption caused disruptions of pilot plant operation and other research activities. The effort being exerted by FORPRIDECOM in acquiring a budget for a deep-well water supply system is fully appreciated.

b. Electrical power - Unscheduled power cut-offs sometimes hampered project activities. The 3-unit small transformer, in addition to the other 3 big units purchased by FORPRIDECOM has remedied the problem of electrical power supply. However, a stand-by generator is necessary to ensure continuous pilot plant operation.

2. Staffing

(Plan and Performance)

i. At present, there are eight (8) regular personnel and twenty-five (25) contractual KBI* personnel for the Project. In addition, there are seven (7) other-project personnel and three (3) casual employees supporting the Project. Refer to Annex G.

ii. Three (3) out of thirteen (13) personnel trained in Japan transferred to other agencies. However, this did not affect project implementation.

iii. Technology transfer through lectures and seminars have been conducted by the counterparts to complement those of the experts to upgrade skills of FORPRIDECOM personnel, especially those concerned with the pilot plant.

(Comments)

i. Several more positions were approved by the Ministry of Budget. Recruitment of qualified personnel for these

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* Key Budgetary Inclusions

positions is in progress.

ii. Problems have been encountered specially on the status of the support contractual personnel. Their integration to the regular plantilla on a permanent status is being requested to assure continuous pilot-plant scale research and development and make use of the expertise of the counterparts who were trained locally and abroad.

iii. The efforts of FORPRIDECOM towards increasing the project personnel to thirty-seven (37) is greatly appreciated.

3. Management and Administration

(Plan and Performance)

i. FORPRIDECOM submitted a request and justification to the ministries concerned for the integration of the Particle-board Pilot Plant Section as one of its technical divisions.

ii. Refer to Annex G.

(Comments)

i. The Pilot Plant Section is basically a research unit and as such depends on other divisions of FORPRIDECOM for administrative support and in turn coordinates with other divisions/agencies. Pilot Plant technical staff had to do coordination, follow-up, and supervision jobs pertaining to installation, construction, etc., which were not in their line of work nor expertise. These brought delays on research and other activities.

The proposed integration will ensure permanent employment of concerned personnel, more efficient organization, and improved plant operation.

ii. Proposed organization charts are shown in Annex H and I.

4. Equipment

(Plan and Performance)

i. From 1976 to 1981, Japanese provision of equipment worth ₱11,759,950** including shipping costs had been received by FORPRIDECOM. Cost breakdown is shown on Annex B.

ii. All these equipment had been installed at the pilot plant. Cost of installation of major processing equipment borne by FORPRIDECOM totals ₱1,466,232 (Annex A-I-B). Laboratory equipment had been properly installed.

iii. FORPRIDECOM also purchased counterpart equipment worth ₱525,351 (Annex A-I-C).

iv. Proper control, maintenance, and repair of equipment are being enforced at the pilot plant by counterpart personnel with the cooperation of Japanese experts.

(Comments)

i. The competence of experts sent to FORPRIDECOM for the supervision of installation, repair, maintenance and production technology is highly recognized and commended.

ii. Delays in the installation of some equipment were due to the difficulty in obtaining from the local market materials that conform to Japanese specifications.

5. Japanese Experts

(Plan and Performance)

i. Japan has sent two (2) long-term experts and twenty-five (25) short-term experts. In addition, six (6) teams were

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** ₱1.00 = ¥30

also despatched in connection with the Project.

ii. Privileges specified in the Colombo Plan including lodging are being granted.

(Comments)

i. In general, all the experts worked very closely with counterparts in all lines of activity.

ii. Despite initial difficulty in communication, Japanese experts interacted satisfactorily with the counterparts and other FORPRIDECOM personnel.

iii. It has been noted that all assigned experts showed genuine interest and exerted all efforts for the eventual self-reliant operation of the pilot plant.

6. Training in Japan

(Plan and Performance)

i. Since 1976, twenty (20) personnel have been sent to Japan. These include thirteen (13) trainees who studied various aspects of particleboard technology; one (1) Project Leader (invited 3 times), for project operation and management; and two (2) Commissioners (each invited twice) for observation studies and consultation. Annex E is a listing of these Philippine counterparts and their respective field of specialization.

ii. Despite language difficulties, Philippine counterparts have gained much invaluable knowledge during their training.

(Comments)

i. Training durations were usually shortened; and subjects were sometimes different from original programs. The difference

is largely due to administrative reasons, such as delay in the nomination of qualified personnel and processing of travel papers.

ii. The individual training courses at the Iwakura-Gumi Lumber Company, Ltd. and in some research institutions have been satisfactory with the efficient coordination of JICA and cooperation of said company and agencies.

iii. Training of personnel in special fields has almost reached its fullest achievement. It is now necessary to continue counterpart training in Japan emphasizing on advanced training in order to upgrade research capabilities of FORPRIDECOM on particleboard technology.

7. Budget

(Plant and Performance)

i. During the past years of cooperation, the Particleboard Pilot Plant has received funding from various sources with the ultimate aim of promoting the particleboard industry. A summary of the budgetary appropriation and expenditures that have contributed to the implementation of the Project is shown in Annex F.

(Comments)

i. The Philippine government has provided sufficient counterpart fund for the Project. There has been no serious financial problems except for the late release of the first-quarter allotment which affected the initial operations only. As shown in Annex F, the budget for 1982 is also assured.

8. Work Plans and Accomplishment

i. The Project accomplishment based on the Annual Work Plan is shown in Annex J. The targets are indicated by broken lines; actual accomplishment by solid lines.

ii. The following explain the percentage accomplishment of the study program that are graphically illustrated in Annex K with 0%, 25%, 50%, and 100% ratings. Full implementation by the end of (EO) January, 1982 is considered 100%.

1. Chip Preparation

(1) - (5) The plan is to study the preparation of suitable chips from 5 kinds of raw materials. However, by the end of January, 1982, we would have completed studies on only 3 species.

2. Study on Adhesives

(1) Among four types of adhesives planned such as urea-formaldehyde (UF), phenol-formaldehyde (PF), tannin, and polyvinyl acetate adhesives, only one, that is, UF, has been studied and applied in the pilot plant.

(2) Only 3 out of 5 resin content levels have been studied and applied. For surface (S) and core (C) layers, S/C levels are 10/6, 10/8, 12/6, 12/8, and 12/10.

(3) No study was made on the use of any combination of adhesives.

(4) - (5) Only UF was used in board-making and in quality control tests.

3. Press Condition

(1) There are three types of particleboards according to the number of layers: homogenous, multi-layer, and 3-layer. Only 3-layered boards have been experimented on.

(2) Press temperature depends on the kind of adhesives; since only UF is used at present, only one temperature level has been applied.

(3) - (5) Press time, pressure, and step-down method depend largely on board density, among many other factors. Only 2 levels of press time and pressure have been studied for low-density boards such as Kaatoan bangkal and Mollucan sau, and for coconut trunks.

(6) - (7) Pressing was limited to only UF boards.

4. Board Production in the Pilot Plant

(1) - (4) Only 3 wood species have been studied: Kaatoan bangkal, giant ipil-ipil, and Mollucan sau.

(5) - (6) Quality tests and cost studies involved only one out of 5 species.

5. Production Technology

(1) - (6) Adjustments of the 6 production processes were studied for 3 out of 5 target species.

(7a) Production standards were drafted for Kaatoan bangkal particleboards only.

(7b) Operation standards were drafted for each pilot plant machine. However, we need further studies on hot pressing and on machine maintenance.

6. Product Development, Promotion, and Marketing

(1) Survey of raw materials in neighboring towns (within 50-km radius from FORPRIDECOM) was conducted. These include the towns of Pililia, Rizal; Carmona, Cavite; Mabitac, Alaminos, San Pablo and Canlubang, Laguna; and Batangas province.

(2) A report on the prospects of particleboard entitled "Particleboard and Other Wood-Based Panels: An Overview," was made. However, actual local demand for housing and furnitures has not been determined.

(3a) - (3b) No formal in-plant seminar for outsiders was conducted.

(4) Survey of building materials was conducted; quantity and price of each kind have not been determined.

(5) Only the kind of materials for furniture is known.

iii. Among the constraints or delaying factors were the following:

a. Inavailability of transportation or truck for raw material collection;

b. Tedious process of debarking, splitting, and cutting raw materials before chipping as required by the flakers;

c. Inavailability of other types of adhesives;

d. Lack of extraction apparatus which delayed research on tannin adhesive;

e. Adjustments of some of the pilot plant machines which took longer time than expected due to the different characteristics of local raw materials;

f. Frequent interruption of electric power and water supply;

g. Too much paper works including those required by other government agencies;

h. Initial survey works on promotion and marketing were done by only 2 personnel; and

i. No seminar for outsiders was conducted since training of pilot plant operators is still in progress.

IV. CONCLUSION AND RECOMMENDATION

1. Most activities programmed in the R/D and other pertinent papers are reaching their final targets. These are largely due to the efforts of Philippine counterparts with the cooperation of Japanese experts and FORPRIDECOM and JICA officials. However, some activities are behind schedule. These are mainly due to the following factors:

   i. Trouble with utilities, i.e., water and electricity.

   ii. Difficulty in the recruitment of qualified personnel.

   iii. Late release of funds.

   iv. Too much paper works.

   v. Delay in construction due to long bidding procedures.

2. FORPRIDECOM must exert all efforts to provide other necessary infrastructures and facilities, such as water and electric supply, and to promote contractual personnel to the regular positions, in order to assure the continuous and efficient operation of the pilot plant.

3. It can be concluded that at present the particleboard project is now ready for continuous production operation for research and promotion purposes. Manpower development and training of plant operators as well as research activities have been satisfactorily going on although the latter, which is a continuing process has been delayed due to above-mentioned reasons.

4. In accordance with the above observations, it is deemed that further cooperation between both countries is still needed for fourteen (14) months in order to attain the project objectives

as stated below:

i. To formulate process and product standards for various types of particleboard from different materials through continuous board production and quality control studies using the pilot plant;

ii. To develop and promote particleboard utilization for housing, furniture, cabinetry, and other related uses; thus, provide employment for qualified personnel;

iii. To upgrade technical personnel through training in Japan;

iv. To render technical assistance, including product testing, plant productivity improvement, and manpower training for existing particleboard and related industries as well as for the upcoming and prospective entrepreneurs;

v. To develop special types of particleboards by using other types of adhesives, fungicides, fire-retardants, or dye-stuffs; and

vi. To promote mutual understanding and cooperation between the Japanese and Philippine governments.

5. As a result of these studies and discussions, both parties recommend to their respective governments a Follow-up Period and the tentative implementation schedule as follows:

i. The duration of the Follow-up Period is from February 1, 1982 until March 31, 1983; and

ii. The Tentative Implementation Schedule is shown in Annex L.

MUTUALLY ATTESTED AND SUBMITTED
TO ALL CONCERNED

October 30, 1981

MR. EISUKE OKAFUJI
Leader
Evaluation Team
Japan International Cooperation
Agency

FOR. RODRIGO R. VALBUENA
Commissioner
Forest Products Research and
Industries Development Commission
NSDB

ANNEX A

STATUS REPORT ON THE
RP-JAPAN PARTICLEBOARD DEVELOPMENT PROJECT

This report summarizes the accomplishment and on-going activities of the RP-Japan project entitled "Technical Cooperation on the Technological Development of Particleboard in the Philippines."

I. ACCOMPLISHMENT FROM 1977 TO DATE

A. Capital Outlay

The following constructions were completed:

		COST
1.	Pilot plant building & electrical house	₱ 908,367
2.	Researchers' office & testing laboratory	200,000
3.	Annex office & chemical laboratory	369,570
4.	Consultant houses (3 units)	500,000
	Total	₱1,977,937

B. Machinery Installation

The pilot plant machines donated by the Japanese government worth ₱10.2 million were installed:

		COST
1.	Phase I - Chipping section & hot-press foundation	₱ 868,969
2.	Phase II- Drying, gluing, & mat-forming sections	447,263
3.	Phase III-Hot-pressing & finishing sections	150,000
	Total	₱1,466,232

C. Procurement of Equipment

The following supplimentary equipment were provided and installed:

		COST
1.	Transformers	₱ 34,500
2.	Switchboards	18,628
3.	Forklift & chainsaws	170,872
4.	Laboratory balance, fume hoods, hot-plate & sinks	90,067
5.	Spectrophotometer	24,000
6.	Water-circulating systems	42,989

7.	Intercom, paging systems, & fire-extinguishers	10,115
8.	Office equipment	57,898
9.	Furnishings of the consultant houses	60,045
10.	Vehicle accessories	16,237
	Total	₱ 525.351

D. Supplies & Materials

A total of ₱600,000 have been spent for supplies and materials and materials and other maintenance and operating expenses.

E. Project Personnel

The Philippine counterpart for the project include the following:

1. Eight regular personnel of FORPRIDECOM whose total salaries involve: ₱106,692/year.
2. Contractual personnel uder KBI 1.1.1:

	COST
a. 1972 (22 personnel)	₱ 129,460
b. 1980 (27 personnel)	245,449
c. 1981 (37 personnel)	528,000
Total	₱ 902,909

F. Research Accomplishment

The following works were conducted:

1. LABORATORY STUDIES

   a. Production of particleboards from various indigencus materials at different resin content levels and board densities:

a. Kaataon bangkal	h. Red lauan
b. Coconut trunks	i. White lauan
c. Giant ipil-ipil	j. Bagasse
d. Mollucan sau	k. Bamboo
e. Yamane	l. Sawmill & plywood wastes
f. Gubes	m. Mixtures of wood species
g. Native ipil-ipil	n. Mixtures with agriwastes

   b. Product testing by JIS and PHILSA standards

   c. Analyses of commercial wax & adhesives

d. Formulation of suitable adhesives (urea-formaldehyde & polyvinyl acetate
e. Resin distribution analysis by Kjeldahl method
f. Application of fire-retardants
g. Preliminary studies on veneer & paper overlays
h. Formulation & application of tannin adhesive on Kaatoan bangkal particleboards

2. TECHNICAL ASSISTANCE

a. Comparison of two types of UF adhesives supplied by Resins, Inc.
b. Comparison of two types of PF adhesives supplied by Resins, Inc.
c. Comparison of two types of was emulsions supplied by Mobil Oil Co.
d. Production of rice-hull particleboard using modified phenolic adhesive for Philippine Ipaboard Manufacturing Corporation
e. Testing of rice-hull particleboard for Cor Tech company
f. Testing of pulp-asbestos-cement board for AGP Management Corp.

3. FIELD INVESTIGATIONS

Field investigations were undertaken at the following:

a. Particleboard factories of the National Housing Corporation, Timber Export Co., and Cor Tech, Inc.
b. Davao Timber Corporation
c. Paper Industries Corporation (Factories & plantations)
d. Nasipit Hardboard & Lumber Company
e. Sarmiento Plywood company
f. Other wood-using industries

G. Personnel Development

1. In-house training of plant operators were conducted.

2. Four thesis students were given technical assistance and allowed to use laboratory facilities in completing their doctoral, macteral, and undergraduate thesis in particleboard.

3. Three counterpart personnel (Commissioner, RP-Project Leader, and a Science Research Specialist I) attended the XVII IUFRO World Congress in Kyoto, Japan on September 6-12, 1981 and also observed and studied modern facilities and techniques applied in the development of wood-based panels from various research institutions and industries in Japan.

4. Counterpart personnel attended seminars and conferences on Production Technology and Quality Control with JICA experts and researchers.

5. Operation standards for the pilot plant machines were drafted.

6. RP-Project Leader attended the seminar-workshop on Foreign-Assisted Projects conducted by the Ministry of the Budget on October 15-16, 1981 at the Asian Institute of Tourism, Diliman, Quezon City.

H. Evaluation and Information

1. A Technical Note and a brochure were published.

2. The PPS have conducted demonstration and participated in exhibits.

I. JICA Missions

FORPRIDECOM has received a total of 6 JICA missions, including the follow-up team, for project programming, mutual consultations, and evaluation. (Please refer to Annex C.)

J. JICA Experts

A total of 14 Japanese experts, including 2 long-term experts, have been received for the supervision of machine installation and transfer of production technology. (Please refer to Annex D.)

K. Counterpart Training

Fourteen (14) FORPRIDECOM counterpart personnel were trained in Japan on various fields of project operation and management, machinery installation, production processes, marketing and product development. Also, two (2) Commissioners were accepted for observation studies at Japanese research institutions and wood-based panel industries. (Please refer to Annex E.)

L. Important Visitors

Among the important foreign visitors attended to are the following:

a. Ambassador Tanaka & other Japanese embassy officials.
b. JICA Presidents Hon. T. Hogen and K. Arita.
c. JICA Executive Director Hon. Hisatome.
d. JICA Vice-President Hon. T. Hisamune.

e. Ten members of the Japanese Diet.

f. Other Japanese missions.

g. Canadian consultants - Cortech Particleboard Plant.

h. " " - NHC Particleboard Plant.

i. Indonesian " on forest products.

j. Malaysian " on forest products.

k. American " on forest products.

Among local officials, the following have also observed the pilot plant operation:

a. Minister & Vice-Minister of NSDB.

b. Minister of Natural Resources.

c. President & Technical Supervisors of wood-using industries and glue companies.

M. Additional Significant Information

Please refer to the following:

1. Annex B - a. Significant Events.
   b. Equipment Received from JICA.

2. Annex F - Summary of Philippine Counterpart Budget.

II. ON-GOING ACTIVITIES

A. Infrastructures

The following are being constructed:

		COST
1.	Access roads to the pilot plant	₱239,293
2.	Storage of raw materials & finished products	420,415
3.	The 4th unit of the consultant houses, including driveway of fence	160,000
	Total	₱819,708

B. Research Activities

With the guidance of Japanese experts, the following studies are being conducted:

1. LABORATORY STUDIES

   a. Effect of particle geometry on the properties of Kaatoan bangkal, giant ipil-ipil, and Mollucan sau particleboards
   b. Effect of particle geometry on resin adhesive distribution
   c. Dimensional stabilization by proper application of suitable wax and adhesives
   d. Effect of different relative humidity conditions on board strength
   e. Effect of particle acidity on board strength
   f. Effect of layering by density
   g. Overlaying with melamine resin-impregnated paper
   h. Manufacture of cement-bonded particleboards

2. PILOT-PLANT SCALE STUDIES

   a. Production of particleboards from Kaatoan bangkal, coconut trunks, giant ipil-ipil, and Mollucan sau
   b. Production cost studies
   c. Quality control studies

3. FIELD INVESTIGATIONS & PRODUCT PROMOTION

   a. Survey of raw materials
   b. Survey of prospective end-users:
      i. Housing projects
      ii. Furniture industries
      iii. Other wood-using industries

C. Personnel Development

1. Plant operators are continuously being trained and developed.
2. Counterpart personnel participate in technical seminars conducted by Japanese experts.

D. Education & Information

1. Various plant standards are being drafted on raw material acceptance, sampling and process testing, board production, product testing, storage and plant maintenance.
2. Another Technical Note on the uses and market potential of particleboards has been prepared.

E. Project Personnel

The names of project personnel and their positions in the present organization are shown in Annex G and Annex H.

F. Proposal for Integration

It is earnestly requested that the existing project personnel be integrated into the FORPRIDECOM plantilla with a permanent status for the following reasons:

1. To assure continuous operation of the particleboard pilot plant for research and development;
2. For those who were trained abroad, to better serve the government or make use of their acquired expertise; and
3. To solve difficulty in recruiting personnel with the desired qualifications.

(Please refer to Annex I.)

ANNEX B

SIGNIFICANT EVENTS

March 18, 1977	-	Formal Signing of the Records of Discussions and Start of the Project
March 12, 1980	-	Formal Signing of the 22-month Extension of the Project from March 18, 1980 to January 31, 1982
January 30, 1981	-	Inauguration of the Particleboard Pilot Plant
February 5, 1981	-	Signing of the Annual Work Plan from February, 1981 to January, 1982
October 26 to November 5, 1981	-	Project Evaluation and Discussion of Future Plans

EQUIPMENT RECEIVED FROM JICA

1.	Particleboard Pilot Plant Equipment	₱10,176,818
2.	Laboratory Equipment	637,481
3.	Drawing Instruments	6,390
4.	Electro-fax Copyer	19,424
5.	Station Wagon (Toyota Corona)	41,112
6.	Double-cab Pick-Up (Toyota Hi-Ace)	37,283
7.	Scout Jeep (Nissan Patrol)	62,044
	Sub-Total	₱10,980,553
	Shipping Cost	779,397
	TOTAL	₱11,759,950

ANNEX C

JICA Missions Received
for the Particleboard Project

1. Preliminary Survey Team — April 18 - May 8, 1976

Yuko Shigekura	- Team Leader
Hideo Terada	- Member
Hiroshi Takahashi	- Member
Akio Kobayashi	- Member
Hideo Yasuki	- Coordinator

2. Implementation Team — March 7 - 21, 1977

Yuko Shigekura	- Team Leader
Hideo Terada	- Member
Yoshihiro Arakawa	- Member
Naoki Kojima	- Member
Hideo Yasuki	- Coordinator

3. Consultation Team — August 24 - September 6, 1977

Kazuo Ono	- Teamer Leader
Isao Ono	- Member
Kazuhiro Yamakoshi	- Member
Teruhisa Shimomichi	- Coordinator

4. Technical Advisory Team — October 8 - 25, 1979

Kazuo Ono	- Team Leader
Isao Ono	- Member
Kunihiko Fujiwara	- Member
Toshiro Morooka	- Coordinator

5. Technical Guidance Team — January 27 - February 10, 1981

Ryuzo Naito	- Team Leader
Isao Ono	- Member
Fumito Haga	- Member
Kazuo Nakagawa	- Coordinator

6. Technical Evaluation Team — October 25 - November 6, 1981

Eisuke Okafuji	- Team Leader
Masao Gotoda	- Member
Shinya Wakimoto	- Member
Hiromoto Ogata	- Member
Hideaki Kasahara	- Member
Kazuo Nakagawa	- Coordinator

ANNEX D

JICA Experts Received
for the Particleboard Project

Year (No. of Persons)	Duration	Name	Assignment
1977 (4)	Jan. 20 - Mar. 17	Kazuhiro Yamakoshi Nagahide Toda	Mechanical Design Electrical Design
	Oct. 27 - Nov. 10	Kazuhiro Yamakoshi Yoshihiro Arakawa	Mechanical Design Mechanical Design
1978 (1)	Feb. 15 - Jul. 31	Kunihiko Fujiwara	Testing/Laboratory Production
1979 (6)	Jan. 9 - Jan. 23	Kazuhiro Yamakoshi	Mechanical Installation
	Feb. 15 - Mar. 7	Kunihiko Fujiwara	Coordination of Installation of Machineries
	Jul. 3 - Aug. 4	Kunihiko Fujiwara	-do-
	Sep. 26 - Dec. 15	Kazuhiro Yamakoshi	Supervision of Mechanical Installation
	Oct. 4 - Dec. 15	Yoshihiro Arakawa Hiromoto Ogata	-do- Supervision of Electrical Installation
1980 (6)	Jan. 20 - May 31	Kazuhiro Yamakoshi	Supervision of Mechanical Installation
	Feb. 26 - May 31	Shigeo Kurihara	Mechanical Installation
	Feb. 26 - Jun. 15	Nobuo Kushiro	Electrical Installation
	Jun. 11 - Nov. 30	Kunihiko Fujiwara	Coordination of Mechanical Installation
	Jul. 1 - Jul. 31	Shigeo Nakano	Mechanical Installation
	Aug. 26 - Oct. 12	Nobuo Kushiro	Electrical Installation
1981 (10)	Nov. 14, 1980 - Mar. 31, 1981	Hiroki Tanaka	Quality Control
	Nov. 14, 1980 - Feb. 15, 1981	Shigeo Nakao Tomokichi Mizokoshi Kunio Nakama	Mechanical Installation Electrical Installation Mechanical Installation
	Mar. 20 - May 20	Hiromitsu Hagisawa Nobuo Kushiro	Mechanical Installation Electrical Installation
	Apr. 29 - Aug. 31	Masayuki Oka	Quality Control
	Jan. 27, 1981 - Jan. 31, 1982	Hideo Motoki	Project Leader/Promotion and Product Development
	Jan. 17, 1981 - Jan. 31, 1982	Kunihiko Fujiwara	Production Management
	Oct. 24, 1981 - Jan. 31, 1982	Kazuhiro Yamkoshi	Quality Control

AMMEX E

Administration & Technical Counterparts

Trained in Japan

Year (No. of Persons)	Duration	Name	Field of Training
1976 (2)	Nov. 25 - Dec. 22	Francisco N. Tamolang Commissioner	Administration
		Arturo A. Pablo Project Leader	Administration
1977 (2)	Sep. 28 - Dec. 28	Leduvino D. Versola Sc. Res. Specialist II	Machinery Installation and Maintenance
		Librada A. Lee Sc. Res. Specialist I	Testing
1978 (6)	Apr. 21 - Sep. 19	Arturo A. Pablo	Project Operation and Management
		Necitas C. Generalla Sc. Res. Specialist III	Quality Control
		Vicente C. Mallari, Jr. Sc. Res. Specialist II	Glue Preparation and Gluing
		Wilfredo P. Garcia Mechanical Engineer	Flake Preparation and Drying
		Felix V. Eusebio Sr. Mech. Plant Operator	Electrical Installation and Maintenance
	May 22 - June 7	Rodrigo R. Valbuena Deputy Commissioner	Administration
1979 (4)	May 22 - June 7	Francisco N. Tamolang	Administration/ Future Planning
	May 24 - Aug. 24	Antonio G. Centeno Sc. Res. Assistant I	Mat-forming
		Cirilo B. Bobila Architectural Draftsman	Board Finishing
	June 6 - Aug. 24	Orlando R. Pulido Sc. Res. Specialist III	Hot-pressing
1980 (3)	July 9 - Dec. 20	Juliet Sibal Aguinaldo Sc. Res. Specialist III	Marketing & Promotion
		Erlinda A. Lajara Sc. Res. Specialist III	Adhesive Technology
		Luisa S. Canadido Sc. Res. Specialist III	Product Development
1981 (3)	Sept. 3 - Oct. 2	Rodrigo R. Valbuena Officer-in-Charge Office of the Commissioner	Administration
		Arturo A. Pablo	Production Management
	Sept. 3 - Dec. 23	Dwight A. Eusebio Sc. Res. Specialist I	Testing

SUMMARY OF PHILIPPINE COUNTERPART BUDGET

	Expenditures	1978	1979	1980	1981	Total
I.	Personal Services	---	129,460	245,449	528,000	902,909
II.	Maintenance & Other Operating Expenses	956,445	529,177	857,751	312,255	2,655,628
III.	Equipment Outlay	54,660	210,568	17,800	50,000	333,028
IV.	Capital Outlay (Building & Access Roads)	1,800,000	---	61,000	819,708	2,680,708
V.	Other Support Budget from Regular & Assisted Projects	143,000	622,000	531,000	307,000	1,603,000
	T o t a l	₱2,954,105	₱1,491,205	₱1,713,000	₱2,016,963	₱8,175,273

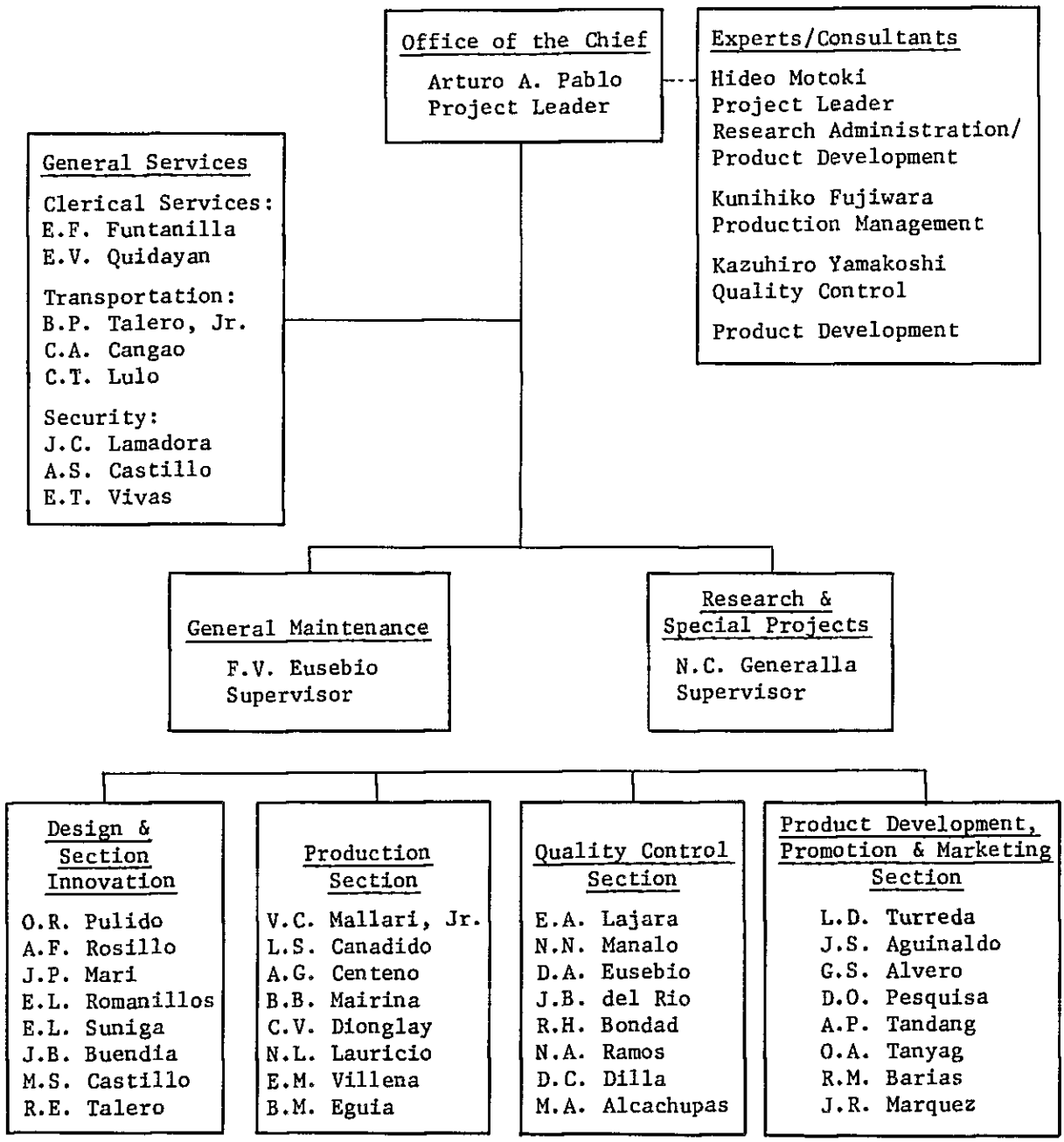
COUNTERPART BUDGET - 1982

1.	Personal Services	₱ 529,000
2.	Maintenance & Ohter Operating Expenses	359,000
3.	Water Supply System (Deep Well)	2,000,000
	Total	₱2,888,000

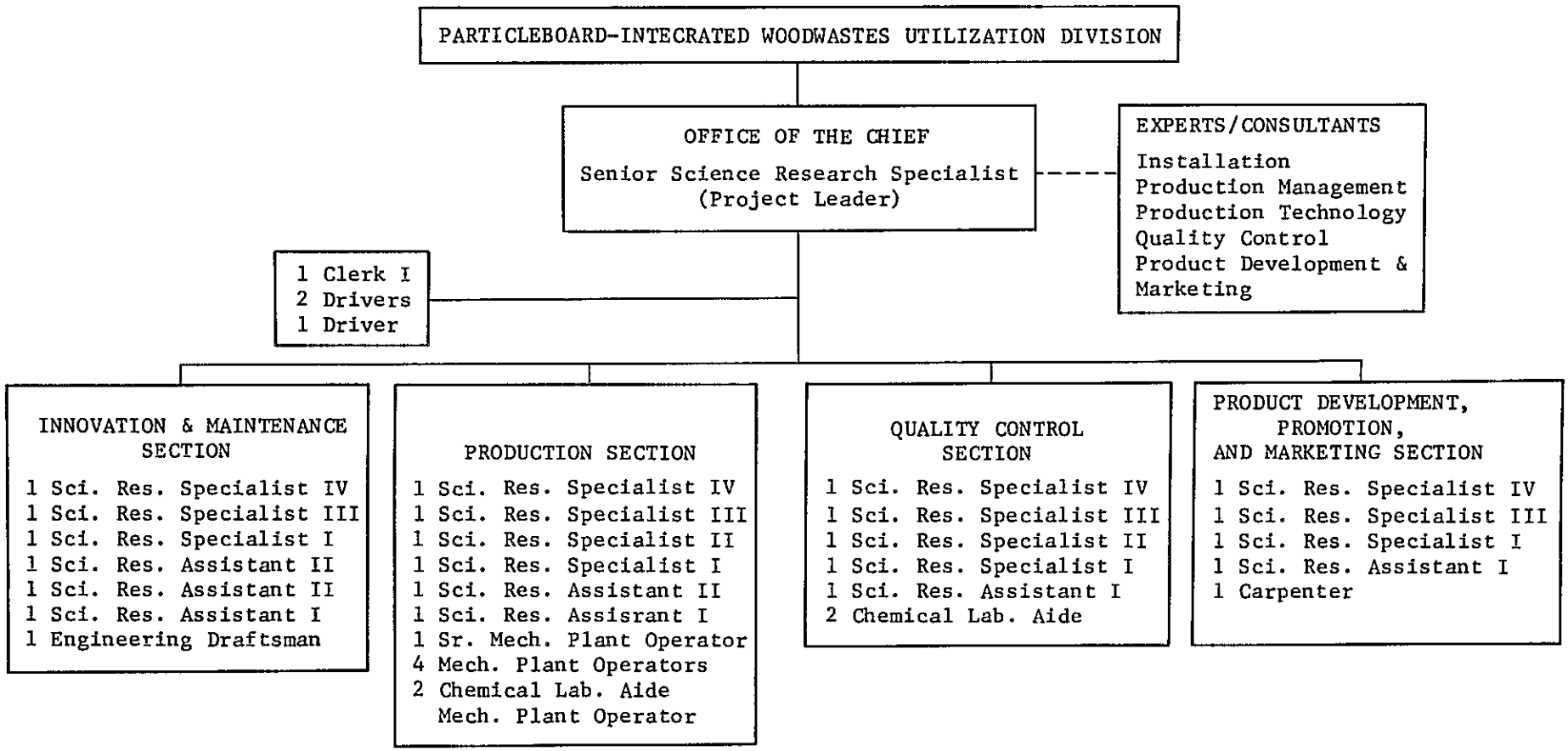
ANNEX G

PRESENT WORKING ORGANIZATION

OF THE RP - JAPAN PARTICLEBOARD PROJECT

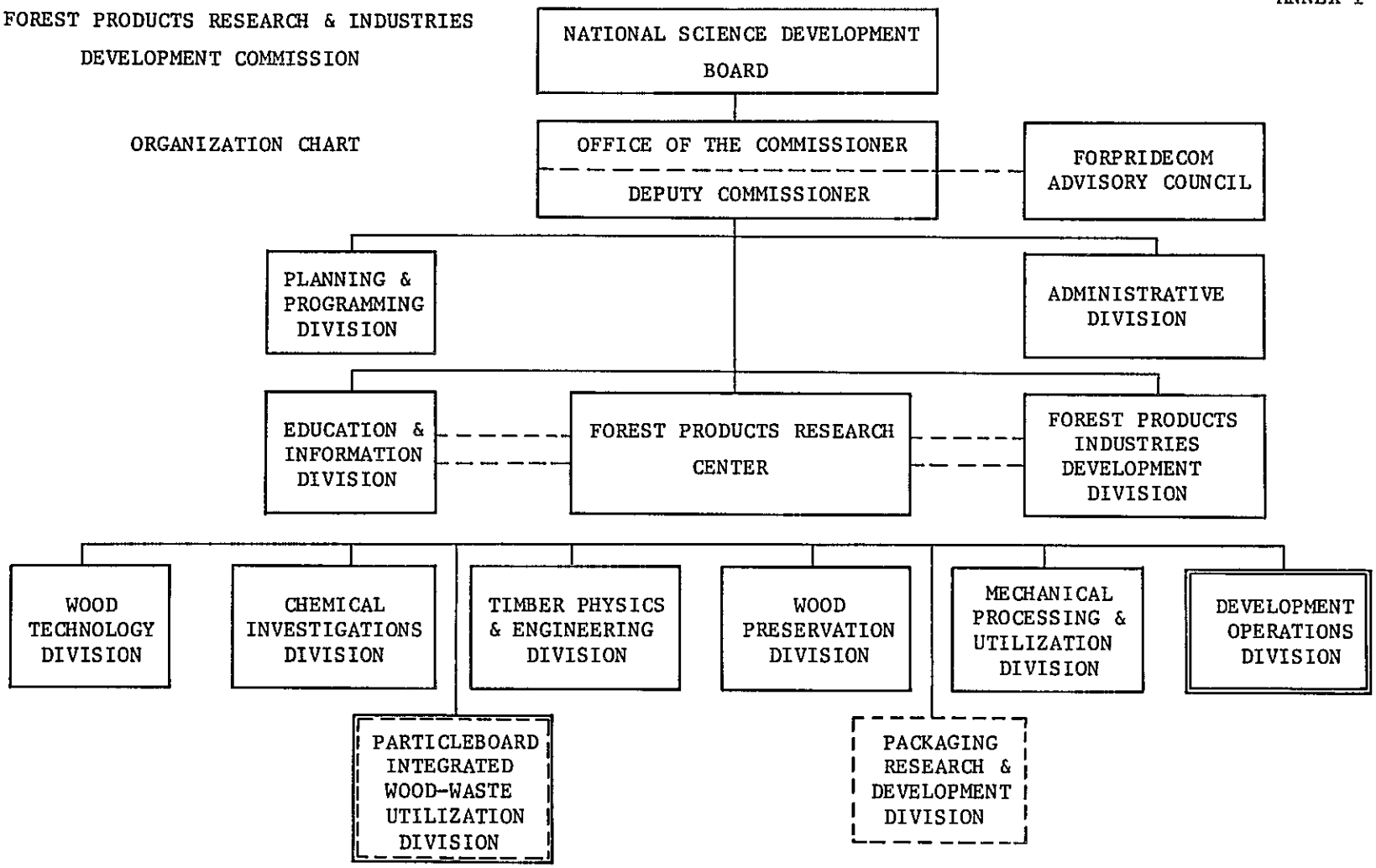


ORGANIZATION CHART (Proposed)

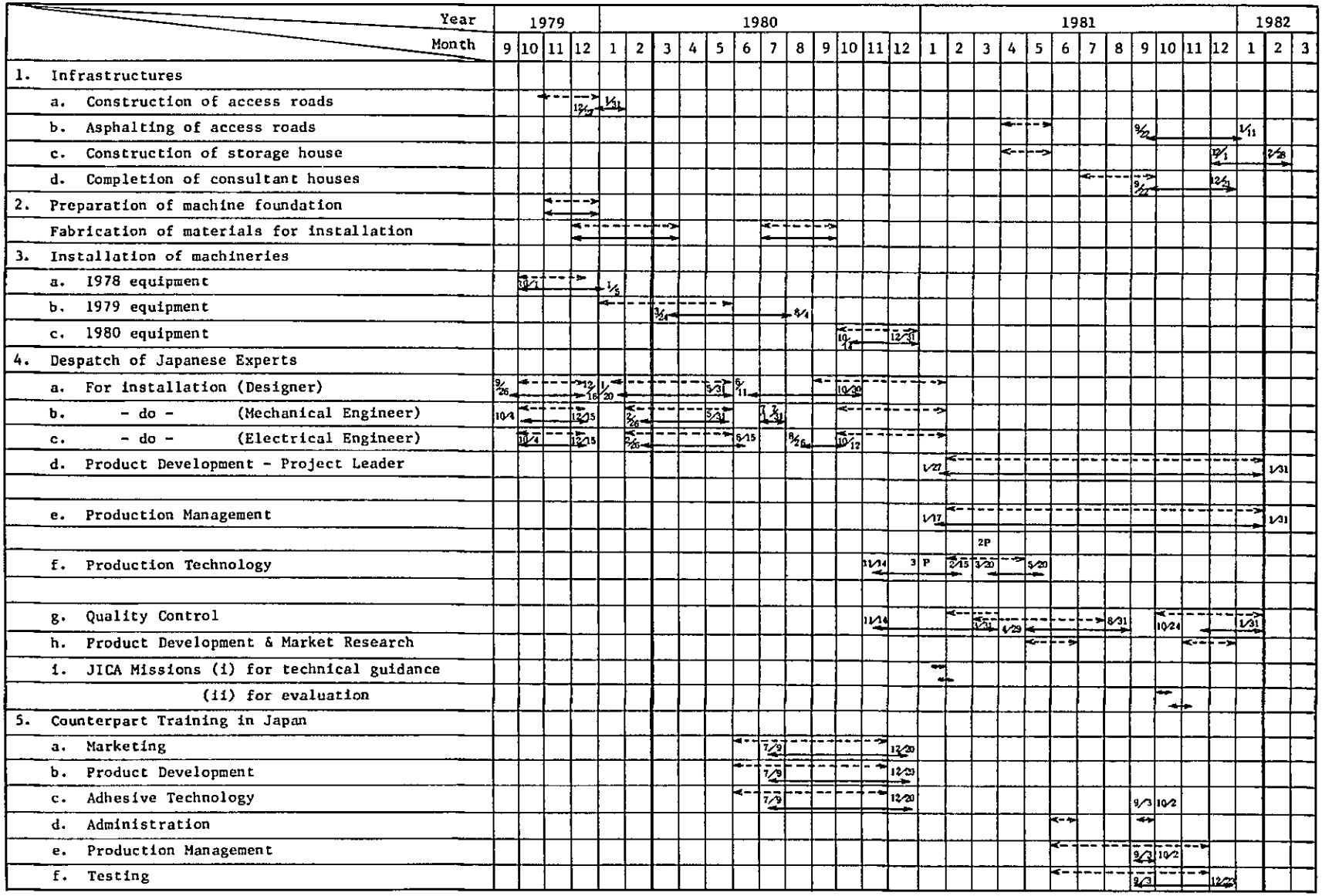


FOREST PRODUCTS RESEARCH & INDUSTRIES DEVELOPMENT COMMISSION

ORGANIZATION CHART

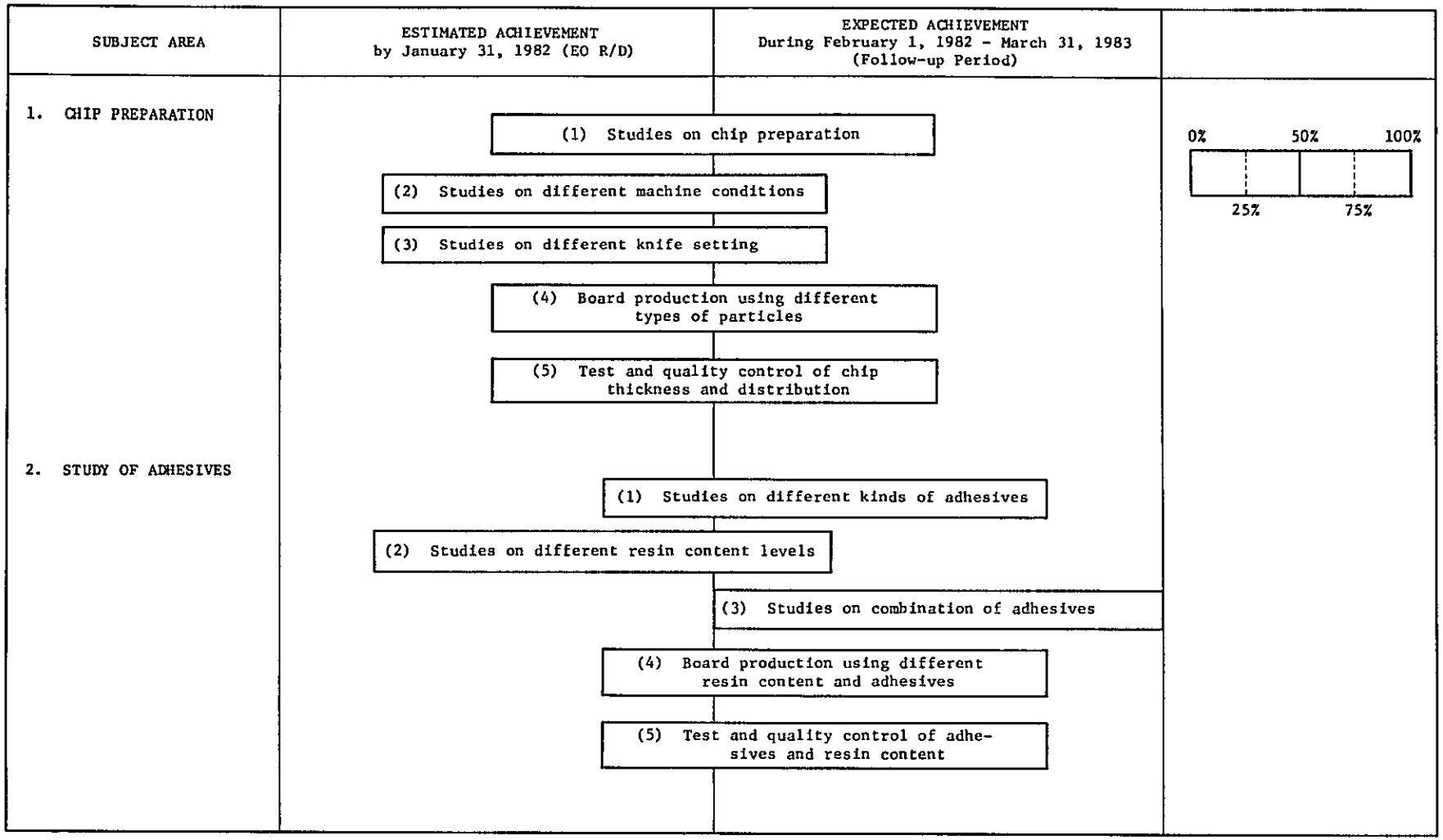


Implementation Schedule of Technical Cooperation for the Particleboard Pilot Plant Project ANNEX J



STUDY PROGRAM IMPLEMENTATION

ANNEX K



SUBJECT AREA	ESTIMATED ACHIEVEMENT by January 31, 1982 (EO R/D)	EXPECTED ACHIEVEMENT During February 1, 1982 - March 31, 1983 (Follow-up Period)	
3. PRESS CONDITION		(1) Studies on board types according to number of layers (2) Adjustment of press temperature (3) Adjustment of press time (4) Adjustment of pressure (5) Studies on step-down process (6) Board production using different press conditions (7) Test and quality control of press conditions	
4. BOARD PRODUCTION IN THE PILOT PLANT		(1) Studies on drying conditions (2) Studies on gluing conditions (3) Studies on board finishing (4) Board production using different species (5) Test and Quality Control (6) Cost Study	

SUBJECT AREA	ESTIMATED ACHIEVEMENT by January 31, 1982 (EO R/D)	EXPECTED ACHIEVEMENT During February 1, 1982 - March 31, 1983 (Follow-up Period)	
5. PRODUCTION TECHNOLOGY		(1) Chip Preparation	
		(2) Drying	
		(3) Gluing	
		(4) Mat-Forming	
		(5) Hot-Pressing	
		(6) Finishing	
		(7) Drafting of process standards	
6. PRODUCT DEVELOPMENT, PROMOTION & MARKETING		(1) Survey of raw materials	
		(2) Survey of potential market	
		(3) Promotion thru seminars	
		(4) Survey of Building Materials considering kind, size, price, quality	
		(5) Survey of furniture materials considering kind, size, quantity, price	

Tentative Implementation Schedule of Activities for the Follow-Up Period February 1, 1982 - March 31, 1983 ANNEX L

Scope of Technical Cooperation \ Year / month	1982											1983				
	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
1. Study Program																
a. Board production in the pilot plant																
i. Kaatoan Bangkal (KB)	←	→														
ii. Giant ipil-ipil/Moluccan Sau (GI)			←	—	—	→										
iii. Coconut trunks (CT)							←	—	—	→						
iv. Woodwastes of mixed species											←	—	—	→		
v. Agriwastes (A)														←	- - -	- - -
b. Formulation of production standards for various types																
of particleboards from at least 3 wood species																
i. Kaatoan Bangkal	←	→														
ii. Giant ipil-ipil/Moluccan sau					←	→										
iii. Coconut trunks									←	→						
iv. Woodwastes of mixed species													←	→		
c. Laboratory studies on																
i. Various raw materials	←	GI	→	←	CT	→	←	—	W	→	←	—	A	→		
ii. Product development including allied products	←	—	—	—	—	—	—	→								
(exterior-type particleboards)																
iii. Tannin or other adhesives			←	—	—	—	—	—	—	→						
iv. Preservation with fungicides, fire-retardants	←	—	—	—	—	—	—	—	—	—	—	—	—	→		
d. Promotion and marketing (Housing and furniture)	←	—	—	—	—	—	—	—	—	—	—	—	—	→		
e. Technical assistance																
i. In-plant seminars			↔				↔				↔			↔		
ii. Seminars for industries					↔					↔						
2. Despatch of Experts																
a. Long-term expert (1 or 2 persons)	←	—	—	—	—	—	—	—	—	—	—	—	—	→		
b. General Plant Maintenance (Mechanical Engineer)*				←	—	→			←	—	→					
c. General Plant Maintenance (Electrician)				←	→				←	→						

* Note: If one of the long-term experts has mechanical expertise, this expert will not be despatched.

Year / month	1982											1983				
	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
d. Quality control				←	→								←	→		
e. Product development						←	→	→								
3. Counterpart Training in Japan																
a. Plant Maintenance (Mechanical)					←	→	→	→	→	→						
b. Plant Maintenance (Electrical)					←	→	→	→	→	→						
c. Process Control					←	→	→	→	→	→						

資　　料　　Ⅱ

（協力事業実績）

フィリピン・パーティクルボード開発技術協力事業に係わる実績

1. プロジエクトの経緯

年	月・日	経緯
1976（51）	2・24	本技術協力の正式要請
	4.18～5.8	事前調査団派遣
	10.25～12.22	プロジェクト管理者受入れ（2名）
1977（52）	1.20～3.17	長期調査員派遣（2名）
	3.7～3.21	実施調査団派遣
	8.24～9.6	計画打合せチーム派遣
	9.28～12.28	第1回技術研修員受入れ（2名）
	10.27～11.10	短期専門家派遣（2名）
1978（53）	2.15～7.31	〃（1名）
	4.28～5.26	プロジェクト管理者受入れ（1名）
	4.21～9.19	第2回技術研修員受入れ（5名）
1979（54）	1.9～1.23	短期専門家派遣（1名）
	2.15～3.7	長期調査員派遣（1名）
	5.22～6.7	プロジェクト管理者受入れ（1名）
	5.24 6.6～8.24	第3回技術研修員受入れ（3名）
	7.5～8.4	短期専門家派遣（1名）
	7.26～12.15	〃（1名）
	10.5～12.15	〃（2名）
	10.8～10.25	第1次巡回指導チーム派遣
1980（55）	1.20～5.31	短期専門家派遣（1名）
	2.26～5.31	〃（1名）
	2.26～6.15	〃（1名）
	3.18	R／D延長　昭和57年1月31日まで
	6.11～11.30	短期専門家派遣（1名）
	7.1～7.31	〃（1名）
	7.9～12.20	第4回技術研修員受入れ（3名）
	8.26～10.12	短期専門家派遣（1名）
	11.14～1981 2.15	〃（4名）内1名　3.31まで

年	月・日	経緯
1981 (56)	1.17～1982 1.31	長期専門家派遣（1名）
	1.27～1982 1.31	〃　（1名）
	1.27～2.10	第2次巡回指導チーム派遣
	3.20～5.20	短期専門家派遣（2名）
	4.29～8.31	〃　（1名）
	9.3～10.2	プロジェクト管理者受入れ（2名）
	9.3～12.23	第5回技術研修者受入れ（1名）
	10.24～1982 1.31	短期専門家派遣（1名）
	10.24～11.6	エバリュエーションチーム派遣

2. 調査団の構成

(1) 事前調査団（1976.4.18～5.8）5名

	（氏名）	（所属）
団長	重倉祐光	東京理科大学理工学部教授
団員	寺田英雄	㈱岩倉組プラント事業部
〃	高橋大	通商産業省工業技術院大阪工業技術試験所
〃	小林秋穂	〃　生活産業局窯業建材課
〃	安木秀夫	国際協力事業団鉱工業開発技術課

(2) 実施調査団（1977.3.7～3.21）5名

	（氏名）	（担当）	（所属）
団長	重倉祐光	総括	東京理科大学理工学部教授
団員	寺田英雄	製造機械	㈱岩倉組プラント事業部
〃	荒川義博	製造工程	〃
〃	小島直樹	品質管理	通商産業省生活産業局窯業建材課
〃	安木秀夫	業務調査	国際協力事業団鉱工業開発技術課

(3) 計画打合せチーム（1977.8.24～9.6）4名

	（氏名）	（担当）	（所属）
団長	小野一男	総括	通商産業省生活産業局窯業建材課
団員	小野惠	建築	㈱岩倉組プラント部
〃	山腰一博	電気・機械	〃
〃	下道晶久	業務調整	国際協力事業団鉱工業開発技術課

(4) 第１次巡回指導チーム（１９７９.１０.８～１０.２５）４名

	（氏　名）	（担　当）	（所　　属）
団長	小野一男	総　　括	通商産業省生活産業局窯業建材課
団員	小野　惠	建　　築	岩倉組木材㈱プラント部
〃	藤原邦彦	技術指導	〃
〃	師岡俊夫	業務調整	国際協力事業団鉱工業開発技術課

(5) 第２次巡回指導チーム（１９８１.１.２７～２.１０）４名

	（氏　名）	（担　当）	（所　　属）
団長	内藤隆三	総　　括	国際協力事業団専門技術嘱託
団員	小野　惠	生産技獣	岩倉組木材㈱プラント部
〃	葉賀　史	運営管理	通商産業省生活産業局窯業建材課
〃	中川和夫	業務調整	国際協力事業団鉱工業開発技術課

(6) エバリュエーションチーム（１９８１.１０.２４～１１.６）５名

	（氏　名）	（担　当）	（所　　属）
団長	岡藤栄助	総　　括	国際協力事業団鉱工業開発協力部長
団員	後藤田正夫	接着技術	日本原子力研究所
〃	脇本真也	プロジェクト運営	通商産業省生活産業局窯業建材課
〃	小形厚博	製造技術	岩倉組木材㈱プラント部
〃	中川和夫	業務調整	国際協力事業団鉱工業開発技術課

3. 派遣専門家の構成

(1) 昭和５１（′７６）年度長期調査員派遣

（担　当）	（氏　名）	（所　　属）
パーティクルボード研究開発	山腰一博	㈱岩倉組プラント部（52. 1.20～ 3.17）
〃	戸田長英	〃　（　〃　）

(2) 昭和５２（′７７）年度短期専門家派遣

機械兼電気	山腰一博	㈱岩倉組プラント部（52.10.27～11.10）
建　　築	荒川義博	〃　〃
パーティクルボード試験分析	藤原邦彦	イワクラホモゲン販売㈱（53. 2.15～ 7.31）

(3) 昭和５３（′７８）年度短期専門家派遣

パーティクルボード試験分析	山腰一博	㈱岩倉組プラント部（54. 1. 9～ 1.23）

(4) 昭和５３（′７８）年度長期調査員派遣

パーティクルボード技術移転プログラム作成	藤原邦彦	㈱岩倉組プラント部	（54. 2.15～ 3. 7）

(5) 昭和５４（′７９）年度短期専門家派遣

建築及びパーティクルボード技術指導	藤原邦彦	㈱岩倉組プラント部	（54. 7. 5～ 8. 4）
機材据付（機械）	山腰一博	〃	（9.26～12.15）
〃（電気）	小形厚幹	〃	（10. 4～12.15）
〃（設計）	荒川義博	〃	（10. 4～12.15）
〃（機械）	山腰一博	岩倉組木材㈱プラント部	（55. 1.20～55. 5.31）
〃（〃）	栗原茂郎	〃	（55. 2.26～55. 5.31）
〃（電気）	久代伸夫	〃	（55. 2.26～55. 6.15）

(6) 昭和５５年度専門家派遣

＜短期＞

機材据付（機械）	藤原邦彦	岩倉組木材㈱プラント部	（55. 6.11～11.30）
〃（〃）	中野繁雄	〃	（55. 7. 1～ 7.31）
〃（電気）	久代伸夫	〃	（55. 8.26～10.12）
〃（機械）	中野繁雄	〃	（55.11.14～56. 2.15）
〃（〃）	中摩国男	〃	（〃）
〃（電気）	溝越留吉	〃	（〃）
製造技術	田中宏樹	〃	（55.11.14～56. 3.31）
〃	久代伸夫	〃	（56. 3.20～ 5.20）
〃	萩原博光	〃	（〃）

＜長期＞

プロジェクトリーダー	元木英生	富山県木材試験場	（56. 1.27～57. 1.31）
製造管理	藤原邦彦	岩倉組木材㈱プラント部	（56. 1.17～58. 3.31）

(7) 昭和５６年度短期専門家派遣

品質管理	岡　正之	岩倉組木材㈱プラント部	（ 4.29～ 8.31）
〃	山腰一博		（56.10.24～57. 1.31）

4. フィリピン人研修員受入れ

(1) プロジェクト管理者 …… ２名（５１（′７６）１０.２５～１２.２２）

• Commissioner N. Tamolang

研究所・工場認の視察及び技術協力案に資する討議

• Mr. Arturo A. Pablo

パーティクルボード開発技術に関する研究

(2) 昭和５２年度第一回技術研修員 …… ２名（５２（′７７）9.２８～１２.２８）

• Mr. Leduvino D. Versola

機械及びパーティクルボード開発技術

•Miss. Librada L. Lee

パーティクルボード試験分析

(3) プロジェクト管理者 …… １名（５３（′７８）4.２８～5.２６）

• Mr. Rodrigo R. Valbuena

研究所，工場等の視察

(4) 昭和５３年度第２回技術研修員 …… ５名（５３（′７８）4.２１～9.１９）

• Mr. Arturo A. Pablo

プロジェクト管理とオペレーション

• Miss. Necitas C. Generalla

品 質 管 理

• Engr. Wilfredo P. Garcia

削片工程技術

• Engr. Vicenta C. Mallari

接着剤工程技術

• Mr. Flex C. Eusebio

電気技術及び保全

(5) プロジェクト管理者 …… １名（５４（′７９）5.２２～6.７）

• Commissioner Francisco N. Tamolang

研究所，工場，大学の視察

(6) 昭和５４年度第３回技術研修員 …… ３名（２名：５４（′７９）5.２４～8.２４
１名：５４（′７９）6. ６～8.２４）

• Mr. Antonio G. Centeno

成型工程技術

• Mr. Grilo Bobira

熱圧工程技術

• Mr. Orland R. Pulido

仕上工程技術

(7) 昭和５５年第４回技術研修員 …… ３名（５５（′８０）7.9～１2.２０）

• Miss. Juliet M. Sibal

市 場 開 発

• Miss. Erlinda A. Lajara

接 着 剤

• Miss. Luisa S. Canadido

製 造 開 発

(8) プロジェクト管理者 …… ２名（５６（′８１）年9.3～１0.２）

• Mr. Rodrigo R. Valbuena

• Mr. Arturo A. Pablo

(9) 昭和５６年度第５回技術研修員 …… １名 （５６（８１）年9.3～１2.２３）

• Mr. Dwight A. Eusebio

5. 機材及び建物

〔1〕 日本側供与機材

(1) 昭和５２年度（１９７７.9船積） 合 計 7,０１１千円

万能試験機	5,０９０千円	乾 燥 器	１０５千円
上四直示天秤	３５５	ステーションワゴン	1,３２６
輸 送 費	１３５		

(2) 昭和５３年度（１９７８.9船積） 合 計 ７1,００２千円

① 機械設備 計 ４８,９５０千円

フレーカー	２1,３００千円	フ ァ ン	2,２３０千円
ハッカー	1,３００	サイクロン	4,５００
ターボフレッカー	9,６５０	ミ ル	7,４５０
スクリュー フィーダー他	2,５２０		

② 電気設備 計 １２,７５０千円

配電盤，制御盤	9,２５０千円
操 作 盤	3,５００

③ 削片製造工程付属品 7,２００千円

ナイフグラインダー

(3) 昭和５４年度（１９７9.9.２０船積） 合 計 １６０,９３６千円

① 削片製造工程残り機材	2,０００千円
② 乾燥工程用機材	４４,５００

③ 分級粉砕用機材　9,５００千円

④ 接着剤配合，塗布用機材　３４,０００

⑤ 成型工程用機材及び電気制御盤　５５,０００

⑥ バイブレーションスクリーン　5,９３６

輸　送　費　１０,０００

(4) 昭和５５年度（１９８０.9.１６船積）　合　計　１０２,９３８千円

① インジェクター　3,３３０千円

② ターナー　2,７８０

③ スペアパーツ　6,０００

④ ハンドリフター他　2,７２０

⑤ コールプレート　2,５１０

⑥ キャリアー　1,３３０

⑦ ルーフファン　1,７８０

⑧ ダ　ク　ト　1,８００

⑨ スケール　8,７３０

⑩ パ　ネ　ル　１０,６１０

⑪ ホットプレス他　２８,８００

⑫ テーブルリフター　1,７１１

⑬ サンダー　１４,０００

⑭ バグフィルター他　１０,２００

輸　送　費　6,６３７

〔2〕 フィリピン側準備事項

(1) 建屋及びその工事

(2) 基礎資材及びその工事

（トロ流し，基礎仕上を含む）

(3) シュート，ダクト，配管，架台及び保温等の資材及びその工事

(4) 受配電設備及びその工事

(5) 照明設備及びその工事

(6) 動力一次，二次配線及びその工事

（制御用も含む）

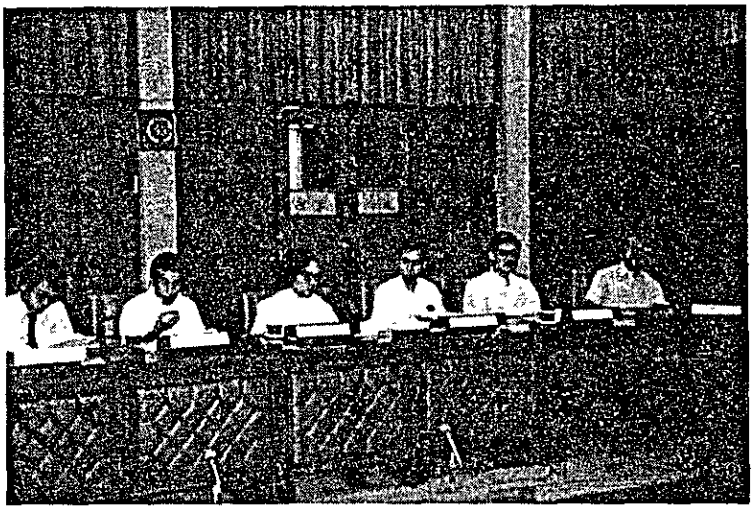
(7) 火災報知・消火設備及びその工事

(8) 試運転に要する油脂類並びにその他消耗品

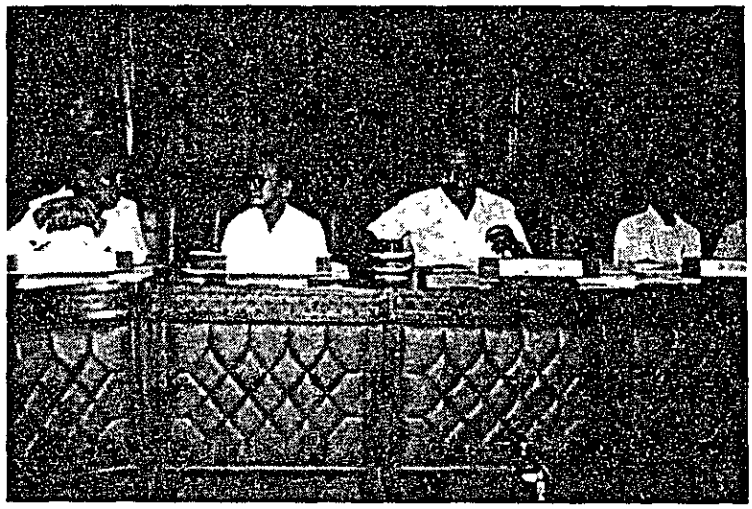
(9) ボイラー

資　　料　　Ⅲ

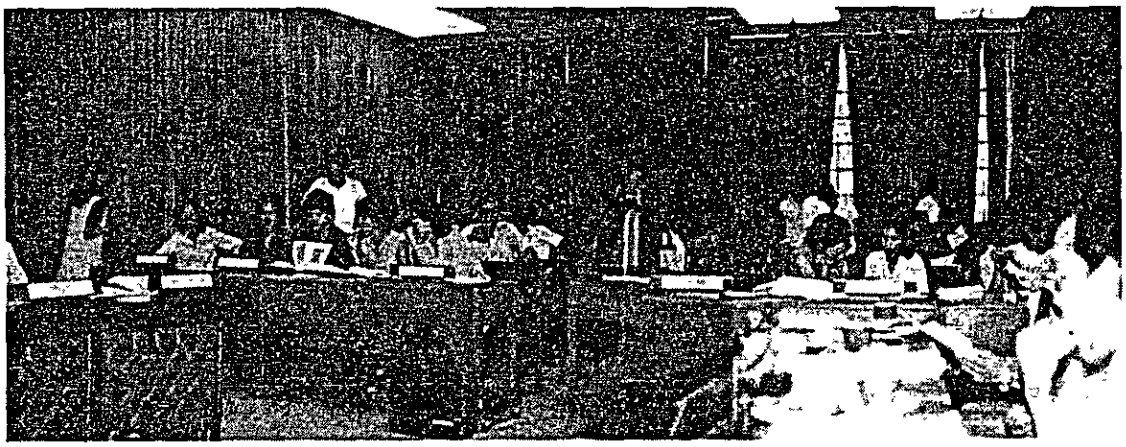
（関　連　写　真）



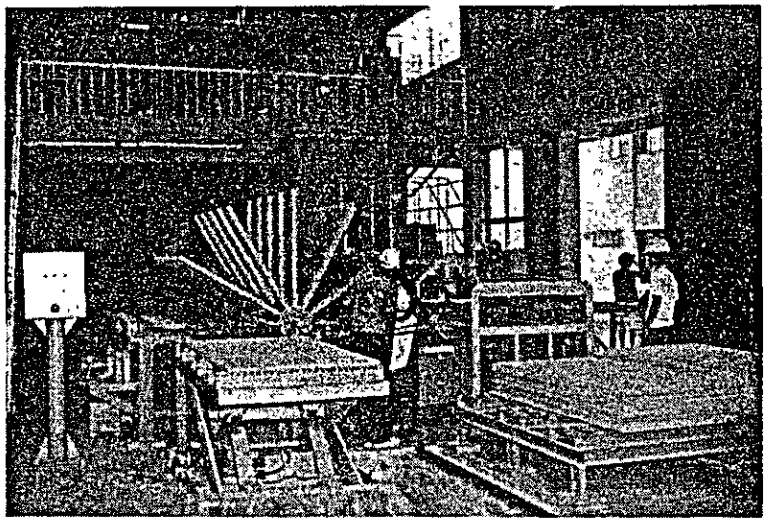
エバリュエーション全体会議
日本側出席者：左から笠原，小形，脇本，後藤田，
中川の各団員，岡藤団長



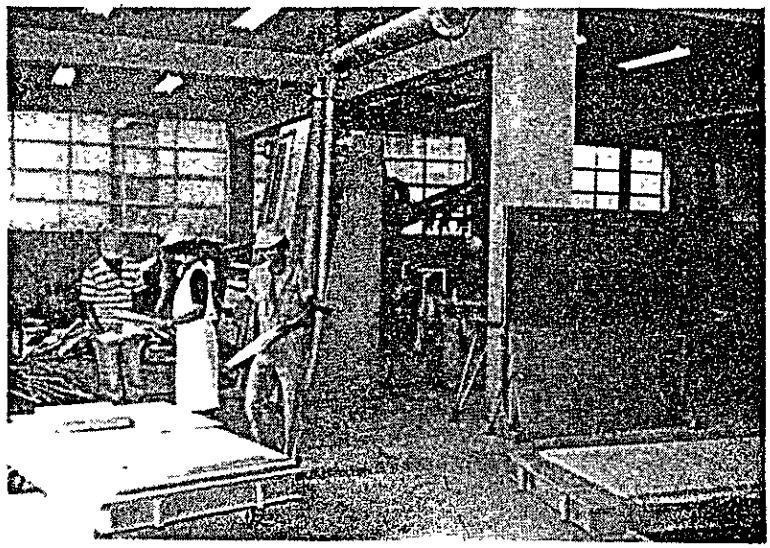
フィリピン側出席者：左端　Valbuena コミッショナー
右端　Pablo プロジェクトリーダー

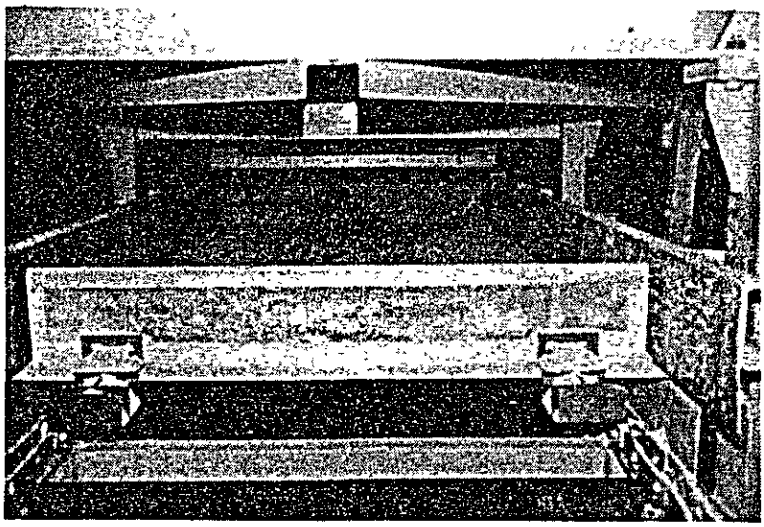


エバリュエーション全体会議，FORPRIDECOM，財務省，NSDB，NEDA 関係者

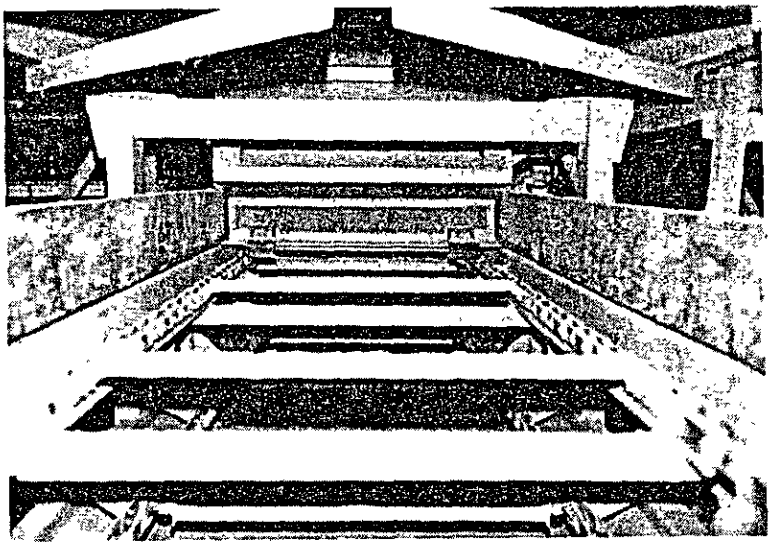


パイロットプラント

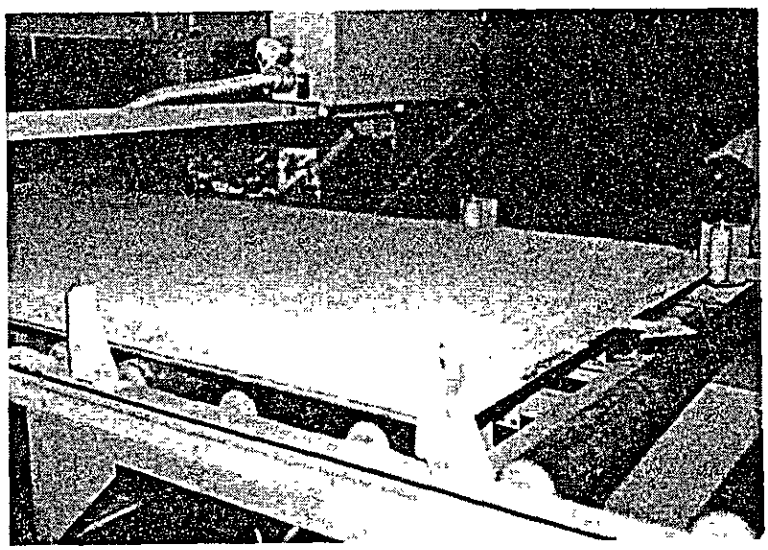


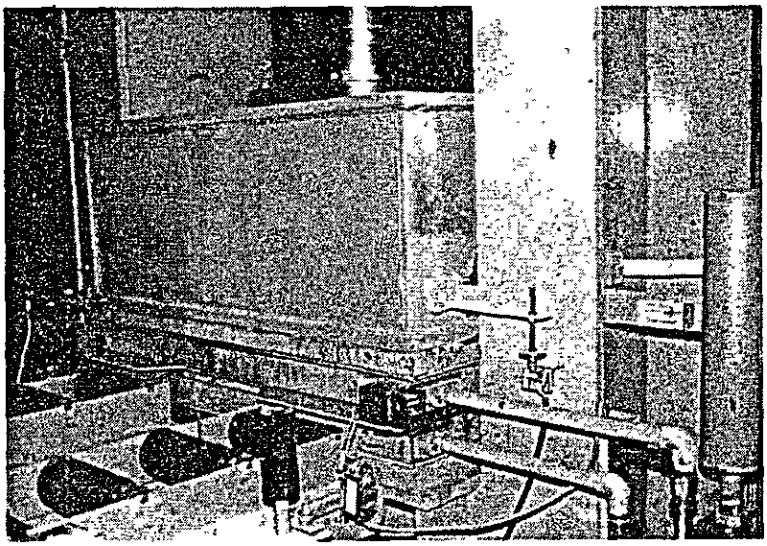


フォーミング工程

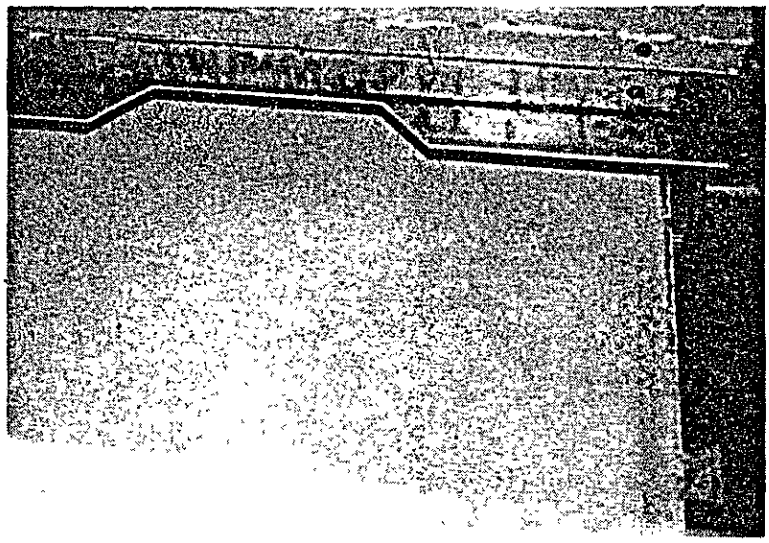


▽ フォーミング工程
▽

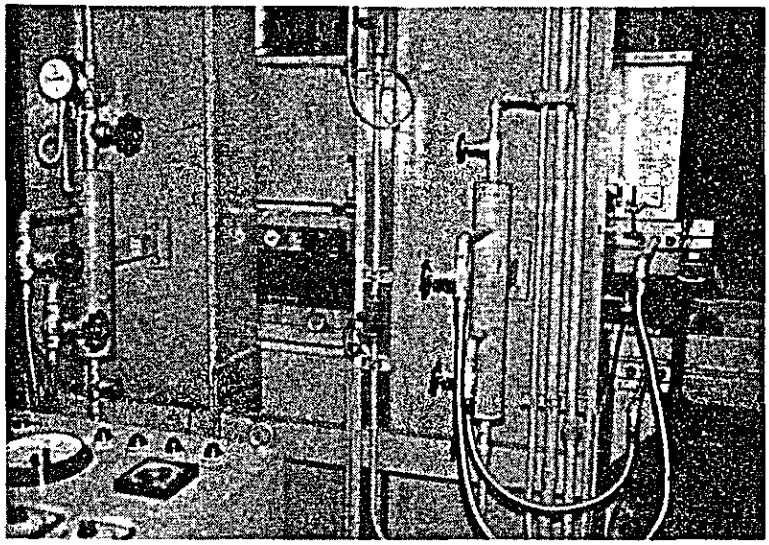


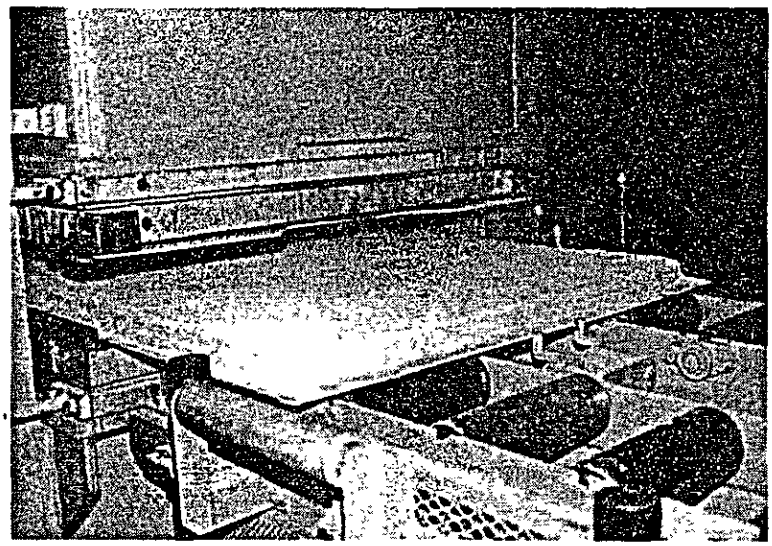


ホットプレス

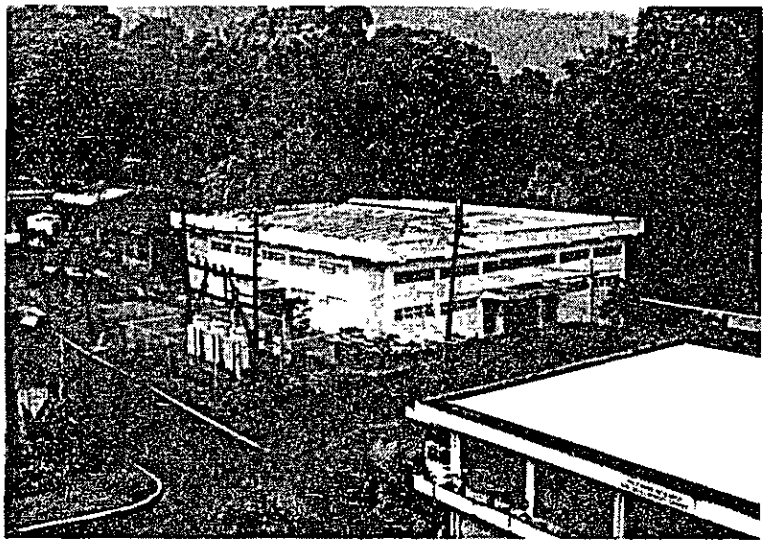


△
ホットプレス ▷
▽

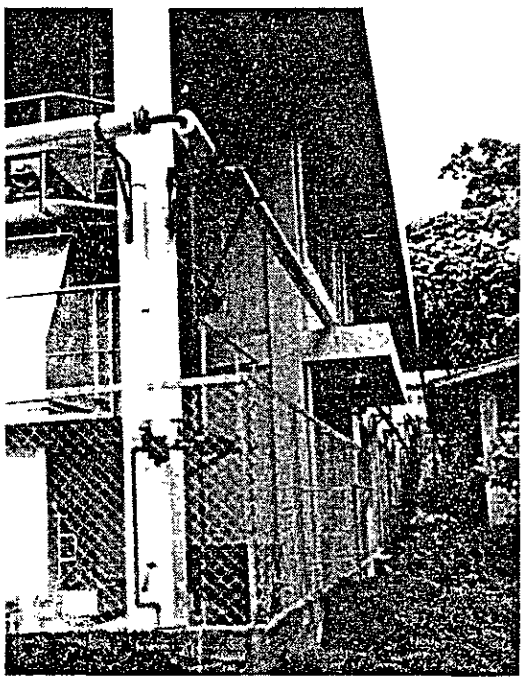




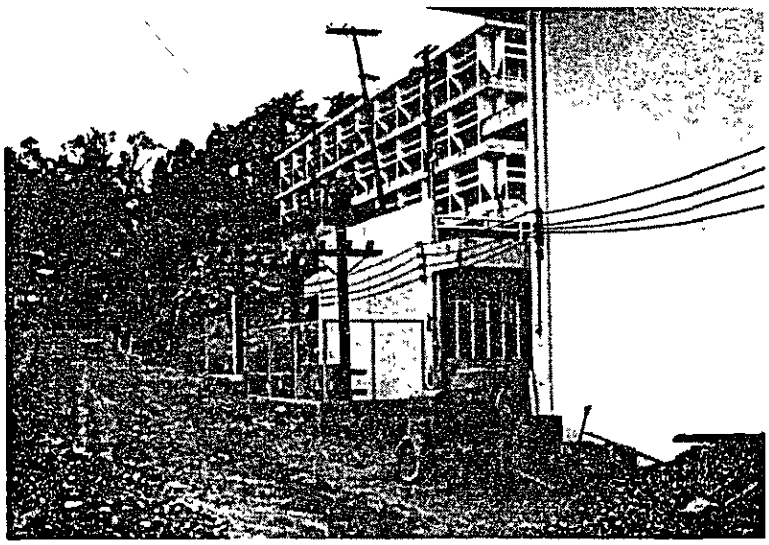
ホットプレスを操作する
カウンターパート



ボイラー建屋
（FORPRIDECOM 全体に
スチームを供給している）



上のボイラー建屋からパーティクルボード
プラントへ供給されるスチーム配管



電 気 室

電気室のトランス

JICA