

スリランカ適正技術研究開発協力事業
巡回指導チーム報告書

1984年3月

国際協力事業団

鉦開技

JR

84-109

JICA LIBRARY



1026502[3]

スリランカ適正技術研究開発協力事業
巡回指導チーム報告書

1984年3月

国際協力事業団

国際協力事業団	
受入 月日 '85. 1. 14	120
登録No. 10988	60
	MIT

は し が き

スリランカ政府は、同国の失業者問題、食糧不足等の問題の解決を図るため、種々の開発事業に取り組んでいるが、その一環として適正技術研究開発センターを設立することによる、中小規模の工業育成及び現地で入手可能な低価格エネルギー開発に係る協力をわが国に要請してきた。

これを受けて国際協力事業団は、コンタクトミッション及び事前調査団をそれぞれ派遣した結果、スリランカ政府の要請内容は、同国の実情に適した事業であり、わが国も協力可能と判断した。

これに基づき、当事業団は長期調査員及び実施協議調査団を派遣し、1981年7月合意議事録(R/D)の署名交換を行った。

1982年12月には、計画打合せチームを派遣し、上記「合意議事録」に基づく本格的技術協力をを行うための具体的事項に関する計画打合せを行った。

今回の巡回指導チーム派遣(1984年2月)の目的は、以上の経緯を踏まえ、現在までの協力実施状況の確認、問題点の把握及び今後の協力方針等について協議を行うことであり、本報告書は、同巡回指導チームがスリランカ側と協議した内容についてとりまとめたものである。

本件協力事業がスリランカの国内開発に寄与し、日本・スリランカ両国の親善の一助となることを切に願うものである。

なお、本事業の推進にあたってご協力いただいた関係機関ならびに関係各位に深甚なる謝意を表する次第である。

1984年3月

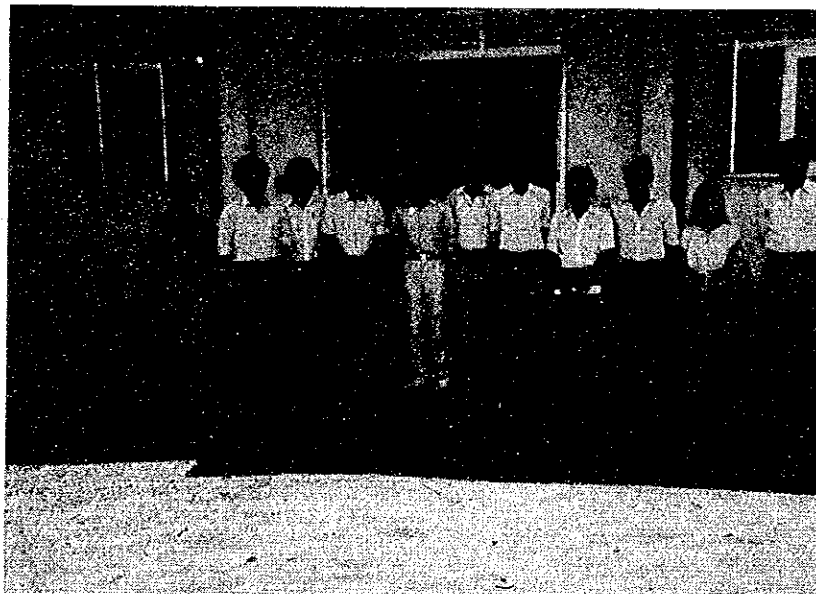
国際協力事業団

鉦工業開発協力部

部長 角 南 平



適正技術研究開発センター工場棟



チーム及び関係者

左から内桶専門家、富所団員、金城団員、鈴木団長、IDB長官
IDBチーフエンジニア、IDB総務部長、三木リーダー、
IDB企画部長、木村団員、池田コロソボ事務所長

目 次

I	巡回指導チームの派遣について	1
1.	派遣の経緯と目的	1
2.	チームの業務の範囲	1
3.	チームの構成	2
4.	日 程	2
5.	関連地図	3
6.	協力の枠組	4
II	センター建屋の建設状況	5
1.	現 状	5
2.	今後の建設予定	6
3.	センターレイアウト	7
III	スリランカ側スタッフの確保状況	8
1.	確保済スタッフ	8
2.	今後のスタッフ確保予定	8
3.	センタースタッフ配置図	10
IV	昭和59年度の協力計画について	11
1.	基本的な考え方	11
2.	センター活動計画	11
V	年次実施計画	14
VI	プロジェクト実施上の留意点	15
別添資料		
I	年次実施計画書	17
II	討議内容	21
III	供与機材据付レイアウト	29
IV	カウンターパート経歴	31
V	センター活動レポート	33
VI	関連写真	45

I 巡回指導チームの派遣について

1. 派遣の経緯と目的

スリランカ政府は、失業者問題、食糧不足、外貨不足等の問題の解決に直面しており種々の開発事業に取り組んでいるが、その一環として、輸送機器、農機具等のための小規模な修理部品供給施設、中小規模の工業育成及び現地で入手可能な低価格エネルギー開発の協力をわが国に要請してきた。

具体的には、昭和54年1月、スリランカ政府よりわが国に対し「適正技術研究開発センター (Appropriate Technology Research and Development Center 以下“ATRDC”という)」の設立に係る協力の要請がなされた。

これを受けて、わが国はコンタクトミッション(54年11月)、事前調査団(54年11月)、長期調査員(55年8月)、同調査結果説明ミッション(56年4月)を派遣し、要請内容の確認を行った。

ついで実施協議調査団(56年6月)により同年7月7日付をもって合意議事録(R/D)の署名交換を行い、中小工業分野における適正技術の開発、普及及び農村地域の中小工業の振興に寄与するための協力が開始された。ただし、R/Dの発効は協力期間を有効に利用するとの観点から署名後6ヶ月(57年1月7日)となった。さらに計画打合せチーム(57年12日)を派遣し、具体的な協力分野につき相手側機関と協議を行った。

今回の巡回指導チーム派遣の目的は、上記の経緯と調査結果を踏まえて、わが国の実施協力を強化し、一層効果あらしめるため実施上の問題点を把握し、今後の協力方針について協議することにあつた。

2. チームの業務の範囲

- (1) 本件協力実績の確認及び59年度協力計画について協議すること。
- (2) スリランカ側の実施している建屋建設の進捗状況を調査すること。
- (3) ATRDCスタッフの人選・配置状況を調査すること。
- (4) 年次実施計画を見直し、59年度年次実施計画書(Annual Work Plan)の署名交換を行うこと。

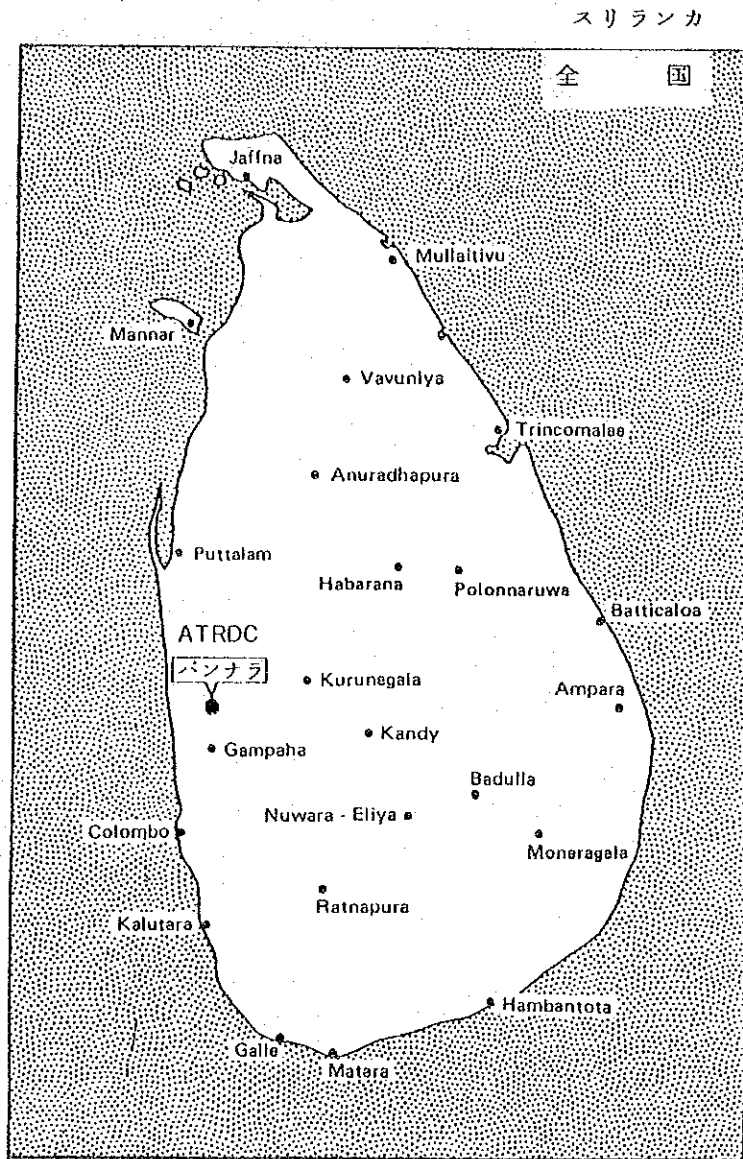
3. チームの構成

氏名	担当業務	所属先
鈴木 茂光	団長・総括	国際協力事業団鉦工業開発協力部調査役
富所 孝栄	技術協力計画	外務省経済協力局技術協力第二課
木村 正子	研修及び専門家派遣計画	(社) 海外コンサルティング企業協会
金城 誠一	業務調整	国際協力事業団鉦工業開発協力部鉦工業開発技術課

4. 日程

順日	月日(曜)	業務内容
1	2/25(土)	東京
2	26(日)	→ コロンボ(移動日)
3	27(月)	日本大使館, 外国援助局, 及び工業科学省表敬訪問
4	28(火)	工業開発庁表敬訪問及び協議
5	29(水)	プロジェクトサイト(パンナラ)へ移動
6	3/1(木)	センターにて関係者と協議及びパンナラ周辺地場産業の視察
7	2(金)	” ”
8	3(土)	調査団内部打合せ
9	4(日)	コロンボへ移動
10	5(月)	工業開発庁と協議
11	6(火)	工業開発庁と協議及び関連施設の視察
12	7(水)	年次実施計画書の署名交換
13	8(木)	日本大使館, 外国援助局, 工業科学省及び JICA 事務所に報告
14	9(金)	コロンボ
15	10(土)	→ 東京

5. 関連地図



6. 協力の枠組

事 項	内 容
協 力 目 的	適正技術研究開発センターを設立することにより，中小工業分野における適正技術の開発・普及，及び地元技能者の訓練を通して，農村地域の中小工業の振興と開発に寄与すること。
協 力 方 針	(1) 金属加工技術における適正技術の研究と開発 (2) 製造及び使用対象者に対する開発された適正技術の普及 (3) 中小金属加工技術企業の技能の向上に協力
協 力 形 態	(1) 日本人専門家の派遣 (2) スリランカ研修員の受入 (3) 機材の供与
協 力 期 間 ※	昭和57（'82）年1月7日から 同 61（'86）年1月6日まで（4カ年間）
協 力 相 手 機 関	工業科学省工業開発庁 (Industrial Development Board, Ministry of Industries and Scientific Affairs)
プロジェクトサイト	クルネガラ県パンナラ地区工業団地内 (Industrial Estate, Pannala, Kurunegala District) コロンボより北東約70km

※本協力事業の R/D の発効（協力期間の開始日）は，スリランカの予算年度が暦年（1月1日～12月31日）であるため，協力期間をより有効に活用するという観点より，R/D の署名後6カ月とした。

II センター建屋の建設状況

1. 現 状

- (1) スリランカ側が実施していた“Machine shop”，“Training shop”及び“Bungalow”の建設は，58年3月に完了したが，59年2月現在，電気設備については，“Bungalow”を除き仮配線であった。
- (2) “Machine shop” “Training shop”の本配線（機械配線）は，それぞれ59年6月，同年8月に完了予定であり，センターの本格的な活動が開始される。
- (3) スリランカ側がこれまでに支出した建設経費は，約161万ルピー（約1,530万円）である。今後建設予定の“Administration Bldg.” “Exhibition hall”等に係る建設予算として400万ルピー（約3,800万円）が確保される見込である。

(IDBより入手した支出済建設経費)

Capital Outlay

1. Construction of workshop and training center building	Rs.	1,161,472/04
2. Resident Director's Bungalow, construction	Rs.	255,536/68
3. Boundary fencing of the center land	Rs.	94,970/50
4. Construction of Bungalow Keepers quarters, Front gate Boundary wall and approach road	Rs.	56,266/70
5. Electrification of the circuit bungalow	Rs.	5,000/00
6. Machine foundation and installation of machinery	Rs.	6,000/00
7. Cost of providing permanent service power connection to bungalow	Rs.	13,750/00
8. Cost of providing a telephone connection to the center office	Rs.	12,000/00
		Rs. 1,604,995/92
		(約 1,530 万円)
		Rs. 1 = 9.5 円

2. 今後の建設予定

(1) 建設スケジュール

建屋名	建設開始時期	竣工予定
Administration Bldg	59年9月	59年12月
Hostel	"	"
Exhibition hall	60年2月	60年4月

なお、“Machine shop”，“Training shop”の本配線については、それぞれ59年6月、8月に完了予定である。

(2) 建屋建設予算

今後着工予定の建設経費 400 万ルピー (約 3,800 万円) の確保については、工業開発庁の上部機関である工業科学省の次官も明言しており、調査団としてもその可能性は大であると判断した。

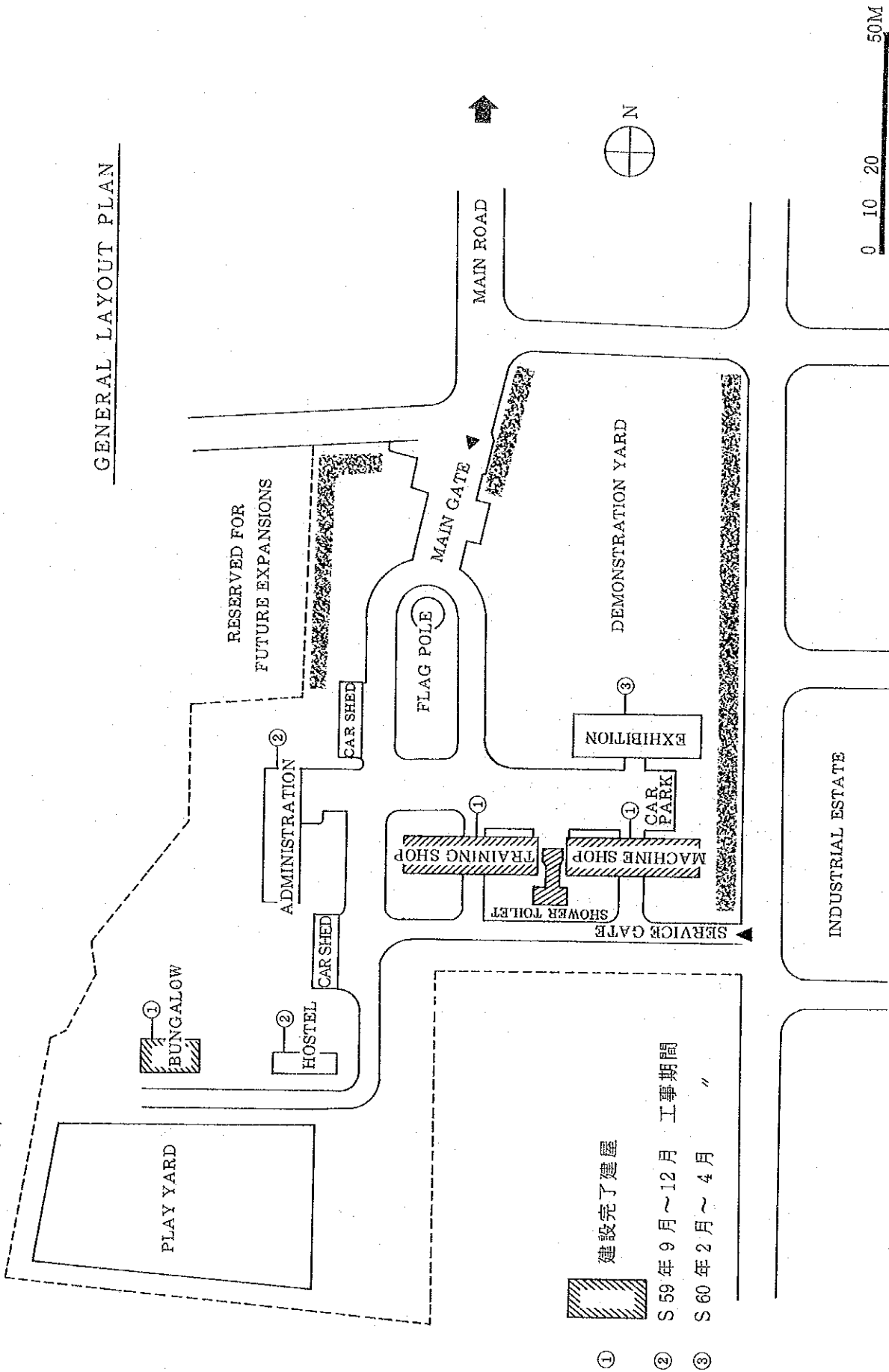
(IDB より入手した建設予算内訳書)

Capital Works for ATRDC Project, Pannala. (IDB 資料)

1. Cost of construction of Administration Building and Hostel	Rs. 900,000/00
2. Cost of Electrification of Administration Bldg.	Rs. 200,000/00
3. Cost of Construction of Exhibition hall	Rs. 675,000/00
4. Cost of Electrification of Exhibition hall	Rs. 150,000/00
5. Cost of Construction of Internal Road ways, & approach road	Rs. 600,000/00
6. Electrification of the Training Center	Rs. 500,000/00
7. Security lighting, Street lamps	Rs. 250,000/00
8. Installation of a Transformant & Service supply	Rs. 500,000/00
9. Contingencies	Rs. 225,000/00
Total	Rs. 4,000,000/00 (約 3,800 万円)

3. センターレイアウト

GENERAL LAYOUT PLAN



- ① 建設完了建屋
- ② S 59年9月~12月 工事期間
- ③ S 60年2月~4月

Ⅲ スリランカ側スタッフの確保状況

1. 確保済スタッフ (59年3月現在)

(1) センター所長

(氏名) Mr. P.I.N. A. Fernando

(生年月日) 1947年12月16日

(資格) 工学士

(前職) セイロン油脂公社技官

なお57年12月の計画打合せチーム派遣時においてセンター所長として内定していた Mr. Gunawardena は、健康上の理由により就任が不可能となり、59年3月 Mr. Fernando が着任した。

(2) Design Engineer

(氏名) Mr. L. M. S. Sisira Kumara

(生年月日) 1951年7月8日

(資格) 工学士

(前職) スリランカセメント公社技官

(3) Technical Assistant

(氏名) Mr. M. M. Abeywansa

(生年月日) 1951年9月20日

(資格) 機械技士 (国家検定)

(前職) スリランカ窯業公社保守管理主任

(4) Extension Officer

(氏名) Mr. D. D. Kumarasinghe

(生年月日) 1953年7月19日

(資格) 工学士

(前職) スリランカ大学ペラデニア校化学部研究員

(5) その他事務員、保守、機械工等5名が確保されている。

2. 今後のスタッフ確保予定

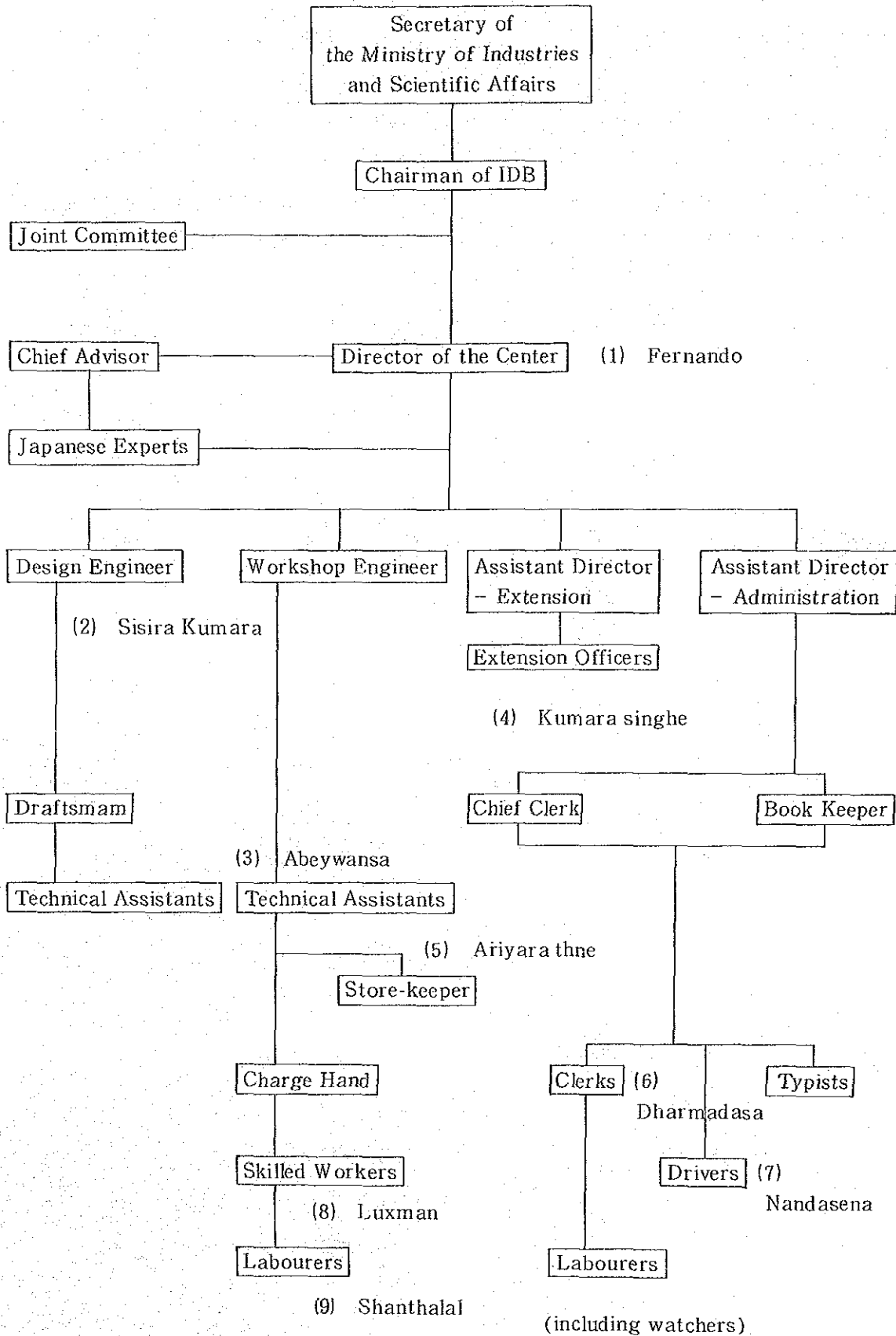
センタースタッフの確保については、プロジェクトサイトが都市部より離れているため困難であるが、本件協力事業実施上必要なカウンターパートの確保は重要な事であるため、IDB に申し入れたところ、下記のリクルート予定が示された。

- | | |
|-----------------------------------|-------|
| a. Assistant Director - Extention | 59年5月 |
| b. Draftsman | 59年6月 |
| c. Technical Assistant (Design) | 59年5月 |

- | | |
|-----------------------|--------|
| d. Workshop Engineer | 59年12月 |
| e. Charge Hand | 59年5月 |
| f. Skilled Workers | |
| Fitter, Welder | 59年4月 |
| Blacksmith, Machinist | 59年9月 |
| g. Typist | 59年6月 |

なお、スタッフの採用は、プロジェクトサイトであるクルネガラ県を中心に行うが、適正な人材の確保が困難な場合は、IDB職員を派遣する等対処するとの事であった。

3. センタースタッフ配置図



IV 昭和59年度の協力計画について

1. 基本的な考え方

関係機関とチームが協議した結果、センター活動計画に対する基本的な考え方について下記のとおり確認した。

- (1) 本件協力期間は、残すところあと1年5ヶ月であり、その期間中にセンター組織、機能の確立に向けて双方共努力する。
- (2) センター機能充実のためには、優秀なカウンターパートの育成が必要であり、彼ら自身でセンターの運営が可能となるよう日本人専門家が指導を行う。
- (3) センターの機能としては、適正技術開発と同時に周辺の地場産業の技術レベル向上を目的とした技術訓練を行うことが適当である。従って、適正技術を研究・開発する機能と技術訓練を行う機能を兼ね備えたものでなければならない。
- (4) 適正技術の開発・普及方法については具体的には、農機具、燃料ガス発生装置及び風力利用機器の開発を通してその手法を学ぶ。

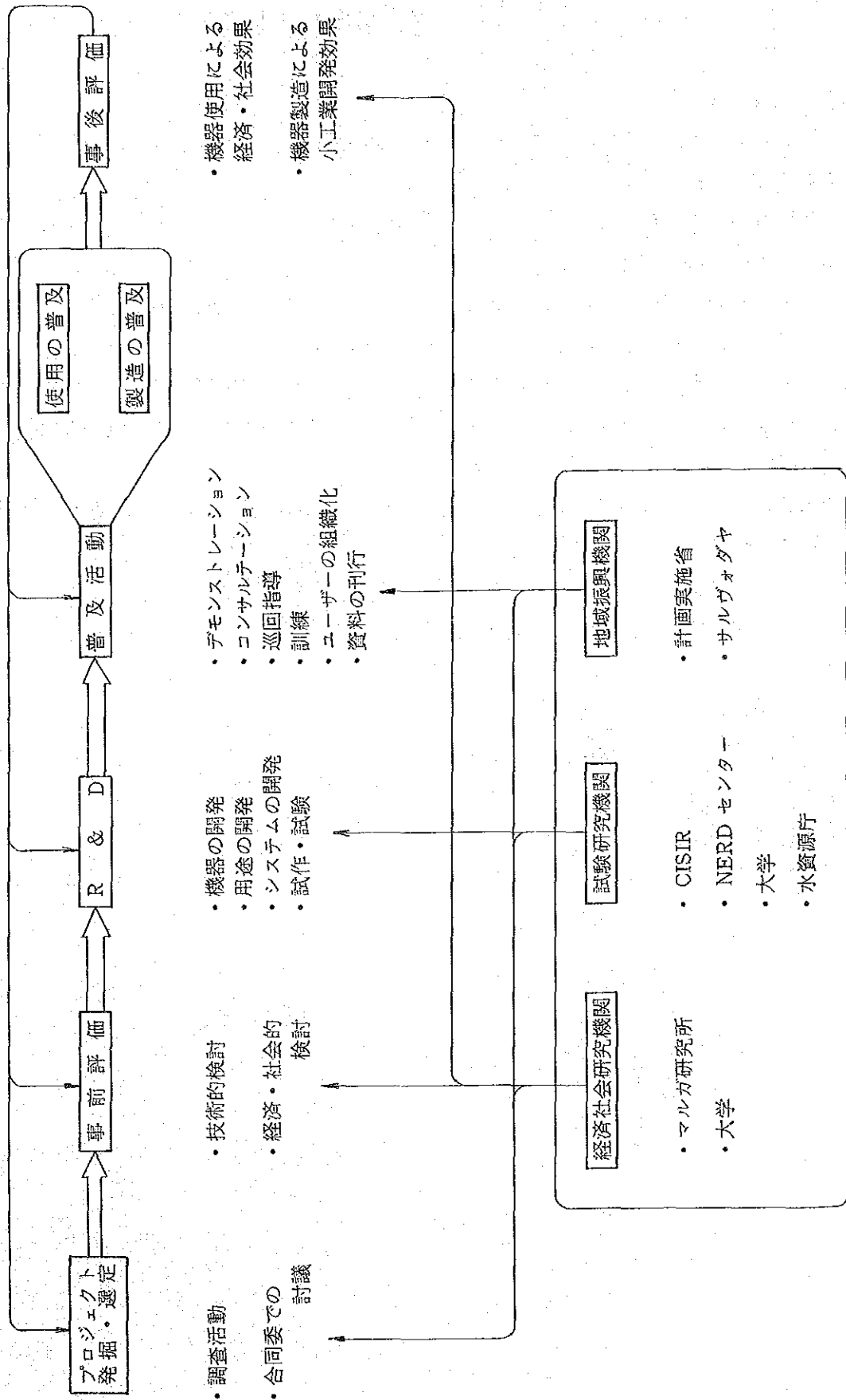
本件協力は、上記機能を備えたセンターの設立を目ざして実施されるものであり、以上の点を考慮して59年度年次実施計画及び特定の適正技術機器開発プログラムを策定した。

2. センター活動計画

59年度は、センターの組織強化に重点を置きつつ、適正技術機器の開発と技術訓練を並行して行うこととする。

(1) 適正技術機器の開発

一般的な開発プロセスは以下のとおり。



59年度においては、開発テーマとして

- ① 農機具（鋤，鎌，鋤等）
- ② 燃料ガス発生装置
- ③ 風力利用機器（揚水用，発電用風車）

を取り上げることとした。

なお、前回の計画打合せ派遣時において窯業分野の要請がなされていたが、協力の優先度が低くなったため、59年度は上記3分野を中心に活動することとなった。

(2) 技術訓練の実施

a. センタースタッフの訓練

試作工場要員及び訓練指導員を養成するため、供与機材の操作法を中心に指導が行なわれる。又、農機具，燃料ガス発生装置，風力利用機器等の試作を通しても行われる。

b. 外部技能者の訓練

プロジェクトサイトであるパンナラ周辺の小規模金属加工工場に対し、技能訓練要望調査を実施した結果、次の方針が立てられた。

・訓練対象者

技能訓練コースへの参加者は、地元中小企業の職員とし、少なくとも数年の経験を有する者とする。

・訓練の実施

59年度は次の訓練を予定し、現在カリキュラムを作成中である。

- (1) 板金・溶接コース
- (2) 旋盤・フライス盤コース
- (3) 鍛造コース
- (4) 工具研削コース
- (5) 治工具コース

・訓練期間

訓練に参加する技能工は、所属工場の現場要員であるためまとまった訓練期間が取りにくく、当面は、週2日2ヶ月間程度とする。

V 年次実施計画

調査団は、IDB と以下のとおり年次実施計画書を署名・交換した。又、双方の意見を確認するため討議内容の署名・交換も行った。(別添Ⅰ及びⅡ参照)

年次計画の内容

1. 建屋建設及びスタッフの確保……………本報告書Ⅱ及びⅢに記載のとおりである。
2. 第二次巡回指導チームの派遣……………60年1月上旬
3. 日本人専門家の派遣
 - 1) 長期専門家
 - (1) チーフアドバイザー……………58年3月～61年1月
 - (2) 適正技術製造開発……………58年9月～59年9月
 - (3) 技術訓練……………58年9月～59年9月
 - (4) 普及……………58年9月～61年1月
 - (5) 機械設計……………59年6月～61年1月
 - 2) 短期専門家
 - (6) 農機具及び燃料ガス発生装置……………59年7月～59年8月
 - (7) 風力利用機器……………59年12月～60年1月
 - (8) その他
4. スリランカ側カウンターパートの受入れ
 - (1) IDB 長官……………59年9月～2週間
 - (2) センター所長……………59年7月～5ヶ月間 (視察)
(センター運営、管理中小企業経営等)
 - (3) 普及担当官……………59年7月～5ヶ月間
(普及の手法、品質管理、製品開発等)

以上、59年度受入れ枠は3名であるが、その他工場長、IDB幹部職員1名の視察研修の要望があった。

5. 機材供与

- (1) 昭和57年度分機材(工作機械等約46,000千円)は、58年6月に据え付けを完了した。
- (2) 昭和58年度分機材(工作機械等約32,000千円)は、59年1月サイトに到着し、現在据え付け中である。
- (3) 昭和59年度分機材(工作機械等)は、本年12月までにサイトへ搬入させる予定である。

VI プロジェクト実施上の留意点

本プロジェクトを円滑に実施するためには、以下の点に留意する必要がある。

- (1) 本件協力の最終的な目標は、適正技術研究開発センターが農村工業の発展に役立つ活動を自立的に行えるように人材及び組織を確立することであり、日本側の協力がそのためのモメンタムとなることである。
- (2) 59年度においては、農機具、燃料ガス発生装置及び風力利用機器等に係る適正技術の開発を通じ、センタースタッフに対して具体的な適正技術の研究開発手法を指導する。又、地元技能者に対する技術訓練を行うことにより地場の技能レベルの向上を図り、かつセンターの訓練機能の充実に努める。
- (3) 上記目標の達成のためには、優秀なカウンターパートの確保が重要であり、そのリクルート方法につき IDB 及び関係者と協議する必要がある。
- (4) 技術訓練の効果的な実施のためには、適正なカリキュラムを作成すべきであり、専門家に対し後方より支援する必要がある。
- (5) 59年度年次実施計画の実行には次の2点の重要なファクターがあり、チームは IDB に対し強く申し入れを行った。
 - a) 本年6月までには、工場の機械配線が終了していること。又、最少限必要なカウンターパートを確保すること。
 - b) 本年12月までに事務所棟の建設を完了していること。(現在、工場棟の一部を事務所として使用しているため、今年度供与機材の据え付け場所を確保する必要がある)

資 料

- I 年次実施計画書
- II 討 議 内 容
- III 供与機材据え付けレイアウト
- IV カウンターパート経歴
- V センター活動レポート
- VI 関 連 写 真

資 料 I

年 次 実 施 計 画 書

ANNUAL WORK PLAN

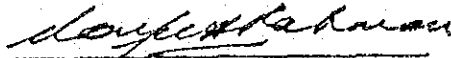
FROM APRIL 1984 TO MARCH 1985
OF THE TECHNICAL COOPERATION FOR THE APPROPRIATE
TECHNOLOGY RESEARCH AND DEVELOPMENT PROJECT
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

The Japanese side and the Sri Lankan side have jointly formulated, with reference to I - 2 of the Attached Document of Record of Discussions signed between the Japanese Implementation Survey Team and the Industrial Development Board, Ministry of Industries and Scientific Affairs, for the Technical Cooperation Project on the Appropriate Technology Research and Development in the Democratic Socialist Republic of Sri Lanka, the Annual Work Plan from April, 1984 to March, 1985 with its Annex as attached hereto.

Colombo, March 7, 1984



Shigemitsu Suzuki
Leader
Japanese Technical Guidance Team
Japan International Cooperation
Agency, Japan



Naufel Abdul Rahman
Chairman
Industrial Development Board
Ministry of Industries and
Scientific Affairs, Sri Lanka

ANNUAL WORK PLAN

- April 1984 to March 1985 -

Scope of technical cooperation	1984												1985		
	Month	4	5	6	7	8	9	10	11	12	1	2	3		
1. Construction of buildings (1) Electrical wiring of machinery and equipment (2) Administration office (3) Hostel (4) Exhibition hall		Work Shop				Training Center									
2. Sri Lankan staff to be recruited (1) Resident director (2) Assistant director, extension (one with engineering background) (3) Technical assistant, design (4) Foreman/charge Hand (5) Draftsman (6) Skilled workers, such as fitter, welder machinist, Blacksmith (7) Workshop Engineer (8) English Steno-typist															
3. Dispatch of technical advisory team															
4. Japanese Experts (1) Chief advisor (long term) (2) AT Production (long term) (3) Skill training (long term) (4) AT diffusion (long term) (5) AT development & design (long term) (6) Specific AT															
5. Training or counterpart personnel in Japan (1) Observation tour (2) Technical training															
6. Provision of machinery & equipment															

Note: - The Annual Work Plan is subject to conditions that necessary budget will be acquired for the implementation of the project.

- The scope of technical cooperation is subject to change within the scope of the provisions given in the Record of Discussions.

- 'AT' in the above stands for 'appropriate technology'.

Handwritten signature

Program for Specific Appropriate Technology and Skill Training

ANNEX

	YEAR MONTH	1984												1985					
		4	5	6	7	8	9	10	11	12	1	2	3						
I Specific Appropriate Technology 1. Agricultural Implements (Such as mamoty, sickle, etc.) (1) Needs Survey and evaluation (2) Test use in the field (3) Study for improvement (4) Trial production 2. Fuel Gas Generator (1) Needs survey and evaluation (2) Trial production (3) Test run in the field (4) Study for improvement 3. Wind Energy Development (1) Needs survey and evaluation (2) Trial production (3) Test run in the field (4) Study for improvement																			
	II Skill Training (1) Internal trainees (2) External trainees (3) Development of curriculum & teaching materials		(1)		(2)		(2)		(2)		(2)		(3)	(4)	(4)	(4)			(5)

Note: (1) Sheet metal working and welding (3) Forging (5) Jigs and fixture
 (2) Turning and milling (4) Tool grinding

May 1984

資 料 Ⅱ

討 議 内 容

Contents of the Discussions
on
the ATRDC PROJECT in Sri Lanka

1. The Japanese Technical Guidance Team visited Sri Lanka from February 28 to March 8, 1984 for the purpose of exchanging views with the Sri Lankan authorities concerned, so as to make sure of the better arrangements for the successful implementation of the Project.
2. During its stay in Sri Lanka, the Team exchanged views and had a series of discussions with the Industrial Development Board in respect of the progress of the Project and the desirable measures to be taken by JICA and Sri Lankan authorities concerned for the successful implementation of the Project.
3. During the course of discussions, the Team and the Sri Lankan authorities concerned reviewed the achievement of technical cooperation as laid down in the Annual Work Plan from January 1983 to June 1984.

As the result, it was made clear that the implementation had been substantially behind schedule.

4. The present situation of the project implementation is summarized as follows:

- (1) Construction of Buildings

The machine shop, the training center and the bungalow have been completed except for the machine wiring (at present, limited number of machines can be operated by the temporary wiring).

- (2) Recruitment of Sri Lankan Staff

Several essential posts have not been appointed. Resident Director have been appointed but have not assumed his duty.

(3) Dispatch of Japanese experts

Of the long-term experts originally planned, the AT Development and Design Expert has not arrived.

(4) Provision of machinery and equipment

Two consignments of machinery and equipment have been provided according to the original schedule. Some of the machinery and equipment cannot yet be utilised.

Namely:

- A horizontal milling machine which arrived in Sri Lanka in March 1983, was damaged in course of unloading from the vessel but the replacement has not arrived.
- The installation of the second consignment which arrived in Sri Lanka in January 1984 is being undertaken.

(5) Acknowledging that there have been unexpected obstacles which hindered the implementation and that efforts have been made to overcome such obstacles, the Team and Sri Lankan authorities concerned have agreed to make the utmost efforts for the effective and successful implementation of the Project during the remaining technical cooperation period.

Philosophy underlying the annual work plan for April 1984 to March 1985 is given in Annex I.

Necessary measures to be taken by both sides is given in Annex II.

Colombo, March 7, 1984

Shigemitsu Suzuki

Shigemitsu Suzuki
Leader
Japanese Technical Guidance Team
Japan International Cooperation
Agency
Japan

Naufel Abdul Rahman

Naufel Abdul Rahman
Chairman
Industrial Development Board
Ministry of Industries &
Scientific Affairs
Sri Lanka

(Annex I)

Philosophy underlying the Annual Work Plan for April 1984 to March 1985.

Of the four year period of the technical cooperation for this Project, only one year and six months will be left if the Center will become really operational in June 1984, with the completion of the electrical wiring of machinery and equipment and by the recruitment of the minimum necessary counterpart personnel.

To accomplish within this period the objective of the Project as originally planned, great efforts should be made by both the Japanese and Sri Lankan sides.

The objective of the cooperation is, as stated in the Master Plan, to establish a Center which will contribute to promote the development of small and medium industry in rural areas, by research and development of appropriate technology, skill training and etc.

At the end of the cooperation period the Center is expected to become self-reliant. Thus, the cooperation activities will be essentially for the development of competent counterpart personnel and setting up an effective organization.

In this sense, research and development of specific appropriate technology has to be carried out in such a manner to demonstrate how appropriate technology should be developed. Also in response to the needs for upgrading the basic skill of those engaged in the rural industries, training capability of the Center has to be built up.

In the light of the above, the Annual Work Plan for the period of April 1984 to March 1985 has been formulated in the hope that such minimum conditions for self-reliance of

the Center can be attained within the cooperation period which will end on January 6, 1986 as stipulated in the Record of Discussion signed on July 7, 1981.

There are two important mileposts in the Annual Work Plan. Namely:

- (1) June 1984, by this time the machine wiring should be completed and minimum essential counterpart personnel should be recruited and
- (2) December 1984, by this time the construction of the administration office should be completed and some more staff should be recruited. At this point of time the Annual Work Plan for the remaining period will be formulated.

W. J. ...

S

Annex II Necessary measures to be taken by both sides

1. Sri Lankan Side

Items	Time of Completion
<p>(1) Construction of buildings</p> <p>a. Electrical wiring of machinery and equipment - for work shop - for Training Center</p> <p>b. Administration Office</p> <p>c. Hostel</p> <p>d. Exhibition hall</p>	<p>June, 1984 August, 1984 December, 1984 December, 1984 April, 1985</p>
<p>(2) Staff recruitment</p> <p>a. Resident Director</p> <p>b. Assistant Director Extension (one with engineering background)</p> <p>c. Technical Assistant, Design</p> <p>d. Foreman/Supervisor of skilled workers</p> <p>e. Draftsman</p> <p>f. Skilled workers Fitter, Welder Blacksmith, machinist</p> <p>g. Workshop Engineer</p> <p>h. English Steno-Typist</p>	<p>March 12, 1984 May, 1984 May, 1984 May, 1984 June, 1984 April, 1984 September, 1984 December, 1984 June, 1984</p>

S

Sanjiv Kumar

2. Japanese Side

Items	Time of Completion
(1) Dispatch of Japanese experts a. AT development and design (long term) b. Specific AT (Short term) * Agricultural implements * Fuel gas generator * Wind energy development * Others	May, 1984 July - August 1984 July - August 1984 December, 1984 As necessary
(2) Training of counterpart personnel and observation tour in Japan a. Resident director (5 months) b. Extension officer (5 months) c. Work shop Engineer d. Chairman of I.D.B. (2 weeks) e. Others if necessary	July - December 1984 July - December 1984 September, 1984
(3) Provision of machinery and equipment for third consignment	December, 1984

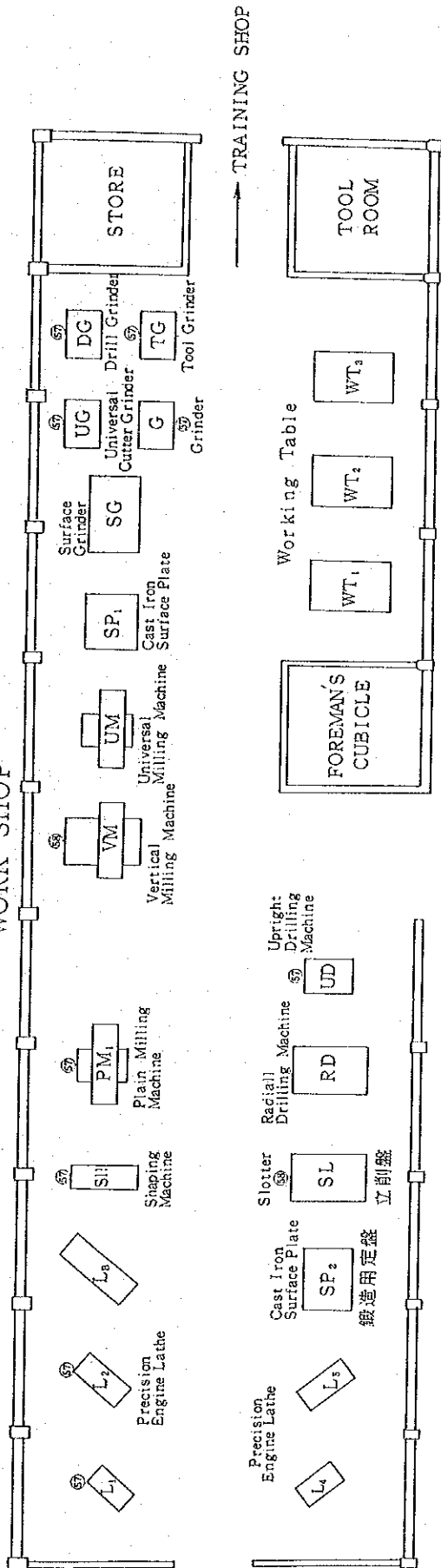
S

Shigeo Akhara

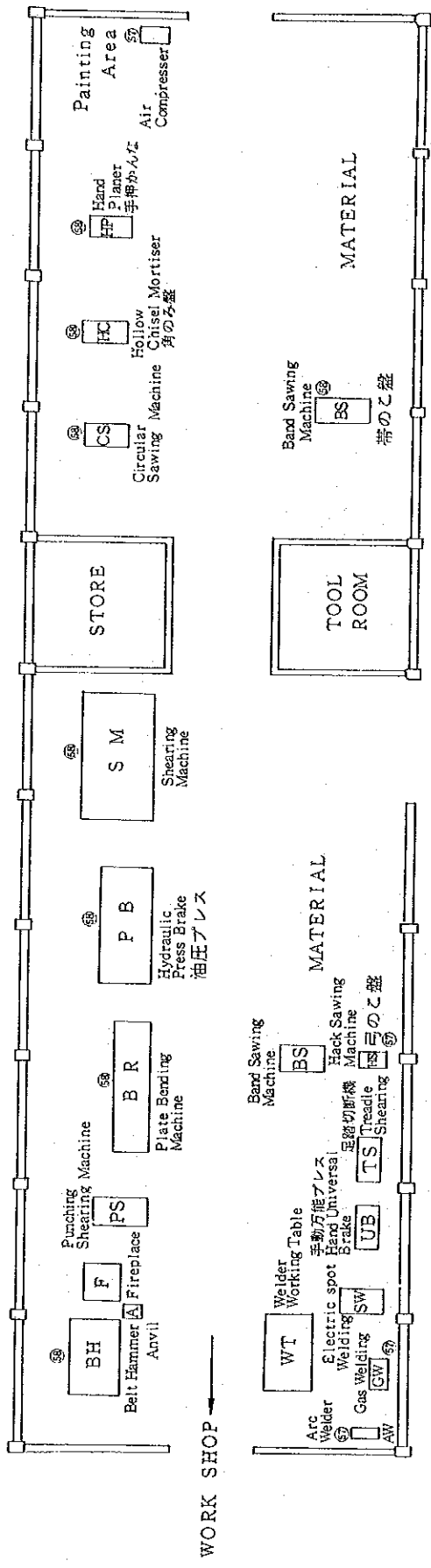
資 料 Ⅲ

供与機材据え付けレイアウト

WORK SHOP



TRAINING SHOP



57 57年度供与機材
 58 58年度供与機材

資 料 IV

カ ウ ン タ ー パ ー ト 経 歴

カウンターパート経歴 (I D B 資料)

Name	Designation	Date of Birth	Qualifications	Experience
(所 長) 1. Mr. P.I.N.A. Fernando	Residence Director	16.12.1947	B.Sc. (Hons)	Assistant Factory Engineering Oils and Fats Corporation, Training Engineer 05.07.75 to-date
(設計技師) 2. Mr. I.M.S. Sisira Kumara	Planning Engineer	08.07.1951	B.Sc Engineering	Mechanical Engineer (trained) Department of Machinery 18.10.76 to 13.11.77 Mechanical Engineer (Designs) Sri Lanka Cement Corporation 15.11.77 to 31.11.82 Mechanical Engineer (Designs) - I.D.B. 17.01.85 to-date
(技師補) 3. Mr. M.M. Abeywansa	Senior Technical Assistant	20.09.1951	National Diploma in Technology (Mechanical Production)	Foreman - Cement Corporation 01.12.77 to 31.03.81 Maintenance Superintendent-Ceramics Corporation 01.04.81 to 14.10.82 Senior Technical Assistant - I.D.B. 15.10.82 to-date
(普及指導員) 4. Mr. D.D. Kumarasinghe	Development Officer	19.07.1953	B.Sc	Assistant Teacher - Education Department 29.08.77 to 28.02.78 Demonstrator - Faculty of Science 01.03.78 to 07.07.77 Development Officer - I.D.B. 04.08.78 to-date
(その他) 5. Mr. J.A. Dharmadasa 6. Mr. S.M. Ariyaratne 7. Mr. D. Nandasena 8. Mr. T. Shanthalal Peiris 9. Mr. W.M.S. Luxman	Clerk Asst:Store-keeper Driver Unskilled Labour Machine Operator			

資 料 V

センター活動レポート

On-Going Activities

A. Infrastructures

Following are being constructed.

- i. Offers already received for Electrical Wiring of the Workshop Building and are being evaluated.
The construct is to be awarded during March 1984 & work expected to be completed by 30th June, 1984.
- ii. Action is being taken to construct foundations for Machine Installation (second batch of machinery).
This work is expected to be completed around 5th April and thereafter Machine Installation work could commence.
- iii. Action being taken to provide permanent power supply to the Bungalow at site.

B. Activities

1. With limited facilities presently available at the center, it is proposed to commence Design & Production of a fuel gas Generator. On completion of the installation of second batch of Machinery received, Design & preparation of drawings for Agriculture Implements could also commence.
2. Until such time AT's are developed I.D.B. Extension Officer and Japanese Expert could further investigate the requirements of forming community & study the demand for wind mills to generate electricity.
3. Trial production of a fuel gas generator could be undertaken towards end of this month, once the essential floor level workers namely a welder and a fitter are recruited.

4. Field Investigations could continue on the present day use of Bio-gas plants, Wind mills for land irrigation, Agricultural implements such as Plough, Thresher, Mamoty, etc.

Investigate the problems faced by used as well as producer.

Provide feedback information to centre staff to find suitable solutions.

Study Training requirements of Industry.

5. To prepare Training Programmes to suit the needs of Local Industrialists.

Formulate Training Programmes for supervisory staff in Industry and for skilled & semi-skilled workers. Training courses to be of short duration because of inability of industrialists to release workmen for long periods.

C. Personnel Development

Action is being taken to recruit on a priority basis one Welder, one Fitter and two Labourers for the Center.

Following personnel will be recruited in the near future.

1. One Draftsman
2. One Supervisor/Foreman (Trainer)
3. One English Steno-Typist

D. Future Prospects of the ATRDC.

Initially with the present available local and Japanese Experts and with limited facilities, Center could commence preliminary work on Development and Production of a Fuel Gas Generator suitable for local needs.

The Centre staff could prepare Training Courses for Training of employees for local industries.

Preparation of training courses for supervisory staff, skilled workers, semi-skilled workers could commence once the Resident Director assume duties. Also identification of industries, number of Trainee to be taken for each course on what areas training to be offered can be undertaken.

The Center's primary role will be to develop Appropriate Technology namely Fuel Gas Generators, Wind Mills for Electricity Generator, Agricultural Implements to suit the need of the Rural Sector.

Once the AT's are designed, developed Prototype manufacture & tested the technology perfected steps will be taken to popularise the equipment through extension services.

Parallel action could be taken to train both supervisory & floor level staff from local industries in methods of production of such AT's and upgrading their skills. Industries could market to the public at equipment produced at their workshops.

At the same time, if there is excess machine capacity, and labour availability, Center could accomodate work orders from industrialists since small & medium scale industrialists do not have specialized machinery such as Milling, Slotting, Shaping, Hydraulic Press, Tool Grinders, etc.

Such works orders could be accepted on a payment basis & this would bring in an income to the Center.

E. Accomplishment of Field Investigations.

1. Sri Lankan Metal Work Industries.

Purposes: to know the general state of metal work industries.

to find out their problems particularly in the production processes

to observe the operator's skill maintenance of the machines and working conditions of the workshops.

Objects: Major public and private sector factories in Colombo area (and South West region of Sri Lanka)

Methods: Observation of the factories and workshops, interview with the Managers, Engineers and so on.

Findings:

- Under the free trade policy, local industries are facing tough competition with imported goods, but some are quite competitive.
- Govt. Corporations are still well protected and tend to have the problems of quality and efficiency as well as less and wastage of materials.
- Safety measures and other working conditions such as lighting are not very well considered.

2. Technical Training Institutes

Purpose: to know the present training systems and the level of skills

Objects: CGTTI, Don BOSCO Training School, SEC, Labour Dept. Vocational Training School

Methods: Visit at the institutions and schools, Interview with the principals, Instructors and trainees. Inquiry about curriculum and timetables

Findings: With higher investment and better management training can be successfully given to the trainees (ex. CGTTI).

Demand for technical training is high (usually there are more applicants than the capacity). Main reason is for the want of migration to ME. (Middle East)

(ex. lighting, working costume, orderliness of the workshop.)

4. Research Institute of AT

Purpose: to know the general state of R & D in various AT areas to exchange ideas and establish contacts with the local scientists and engineers who are engaged in research development, extension and training of AT.

Objects: NERD CENTER, CISIR, SEC, NEW (WRB), Rural Energy Center (CEB) Moratuwa University, Sarvodaya Movement HQ, Marga Inst.

Methods: Visit at the Institutions, Offices, Workshops, and installation sites at AT devices, interview with the staffs in charge of research and development observation at the demonstration campaigns organized by the above Institutes.

Findings:

- Overlapping of research activities without proper co-ordination among the AT institutes.
- Lack of communication among them (but for rivalry)?
- Shortage of ready made scientific data concerning AT equipments developed by the AT institutes.
- Lack of extension service (absence of extension officers and materials)
- Lack of contacts with the customers or local industries.
- "Absent minded professor" like approach towards the development of AT.
- Need for more realistic and 'Mass' oriented attitude.

Most of the institutes lack in training facilities & qualified instructors.

Technical Colleges' school leavers have not good reputation as they lack in practical training.

3. Local Small & Medium Scale Industries

Purposes: to know the general state of local small scale industries particularly in metal work in Kurunegala and Puttalam Districts.

to find out the possibilities of technical assistance to them in terms of guidance, training and other forms of service by ATRDC.

Objects: 15 workshops in and around pannala

Methods: visit at the factories and workshops, interview with the owners, managers, foremen, workers and so on.

Findings: Most of them are badly affected by the free trade policy and tend to concentrate in repairing various machineries such as tractors, agricultural machineries and textile machineries and manufacturing of iron furniture, fences, etc. A few factories are engaged in production of tractor attachments (rotary hallows, trailers, plough, etc.).

They have a common problem of training of their workers, for their foremen also are not properly trained.

As a result, such shortcomings are prevalent as inability to read drawings, improper cutting speed of lathe machine, poor maintenance of the machines, etc.

Also working conditions are much inferior to their counterparts in larger scale

5. Two-wheel tractor owners (Preliminary Survey)

Purposes: to find out the farmers' attitudes towards capital investment for mechanization
to know their capability of maintenance of the machine to know the cost and benefit of the tractor

Objects: Farmers in Katugampola Electorate who are listed as two wheel tractor owners at AGA Office (15 samples out of the total of 70)

Methods: Visit and interview

Findings: Although it is difficult to calculate cost and benefit of tractor (as no one keeps account every owner is positive for the ownership to be profitable.

The reason is the growing cost of buffalo hiring (partially due to the shortage of cattle population) and increased labour cost (partly due to migration for ME) and the total working hour is long enough to pay the cost and depreciation, because the machine is usually used for transportation as well and also for others' field on contract. However, it will remain to see whether this increases unemployment from national economic point of view (fierce argument is currently going on in the circle of economists).

Maintenance is fairly satisfactory illustrating Sri Lankan technical level at grass-roots.

Their attitude for mechanization is quite positive once they are convinced of, so one can expect the same response for AT equipments.

6. (Early adopters) of AT equipments

Purposes: to know who the 'early adopters' are and their financial, social backgrounds and their potential influential power in the rural community.

Objects: Owners of wind mill, these of solar generating system (2 house-holds each) in and around Pannala.

Methods: Visit and interview, Observation of the equipment at work.

Findings: Most of the owners are financially every rich and have some connections with foreign world. But one of the two wind mill owners is a middle class farmer who said he could not afford to buy even two-wheel tractor. This may be showing that wind mill pump set has some potentiality even among ordinary farmers who intend to intensify the land use, which is the very object of agricultural development in Sri Lanka.

All the owners expressed their satisfaction with the devices but admitted that they costed more than other means (ex. Kerosin engine pump set, battery).

7. Local needs for skill training

Purposes: to find out the needs of technical training at local metal work workshops

Objects: Workshops in and around Pannala

Methods: Visit, interview and distributing questionnaire

Findings: Almost everybody interviewed expressed that they want to improve the workers skill especially in (1) Theoretical side of machine

operation such as cutting speed and (2) Reading of the drawing, while the owner prefers their younger apprentice to be trained first in general machine operation (lathe, welding machine, etc.) but foremen and more experienced machinists like to be trained in particular machines which they so far have not experienced, in preparation for better employment opportunities (or migration to ME).

The others also know clearly which skills they lack in. If they are given an opportunity of training in the area which they really, they will improve their skills and knowledge tremendously and then the technical level of Sri Lanka grass-root will be raised since they are in the key position to instruct face to face the great number of apprentice from now on.

8. Conclusions (tentative)

(1) Energy Need

As the rural population are increasingly aware of the urban life style and it's value, and as the farmers get more interested in intensive agriculture, there is growing demand for energy in rural sector interms of (1) Electricity to utilize T.V. and Radio, to light up the houses and to run a pump set, and (2) fuel to run an engine for an irrigation pump set and a generator to supply electricity for the above mentioned items and a battery charger by which they charge a battery for the said electric appliances. But rural electrification by CEB is slow in progress, for it costs the Govt. very much in both generation and distribution. Besides low income class can not afford CEB's high unit price (Overall figure of electrified households are only 20% of the total).

Cheapest electrification is being provided by a battery, but it is quite troublesome to handle especially in transporting to and from a battery charging station. They also complain of unstable voltage of it. As to the engine, they suffer from high price of kerosine and diesel oil as well as high repair and maintenance costs.

(2) Wind Power

Thus alternative sources of energy are needed in the rural areas which ensure them cheaper and easier power supply. In this sense, most freely available energy sources are wind power, solar and bio-mass, especially firewood (and charcoal) in Sri Lanka. Good wind is available in the coast and central hills almost throughout a year, and in the interior area for at least five months. Since a wind mill, can be almost maintenance free for 20-30 years and it's unit cost of electricity can come down drastically, it can supply cheap and steady power for a remote inland village, a hill country and a coastal village where CEB is feeling difficulty in construction of conventional power distribution system. But as scale of economy matters up to the capacity of 10 KW in wind power generation organization of users may be necessary. As to wind mill irrigation pump, there may be a possibility to improve the cost performance of the currently introduced WEU's Model of which more than hundred are actually in operation.

(3) Producer Gas

Since coconut husks and shells cost most of the farmers almost nothing, a producer gas can be the cheapest power source for a pump set and a generator.

If a few technical problems are solved and the manufacturing technique is successfully transferred,

to local manufacturers, it has a good potentiality. In most part of rural Sri Lanka, where firewood (coconut husk, etc.) is abundant unlike India or China, the priority of modern gas development is lower.

(4) Agricultural Implements

Good agricultural implements are essential for intensive agriculture. But there is a good scope for improving the implements especially mamoties and sickles. If they use special kinds of implements designed for each different operation, they can work with greater ease and efficiency as well as with better effect on the yields. This can also boost local blacksmith industry, because large scale production does not suit this designing and repairing has to be done on close contact with the farmers according to each locality's agricultural conditions.

(5) Skill Training

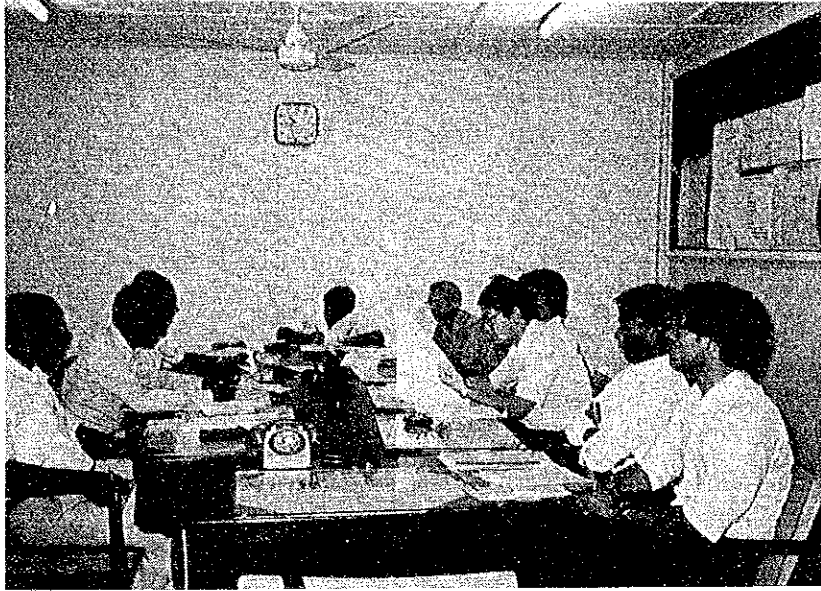
There is a great demand for the training of the machine operators in the local small and medium scale industry. Most of them have no formal training background at schools but for on-the-job training at their own workshops by the foremen who have been trained likewise.

Thus even foremen admit that they lack in essential theoretical knowledge of the work and safety measure, etc. and don't know systematic operation such as the adjustments of cutting speed, maintenance of tools, how to read a drawing and so on.

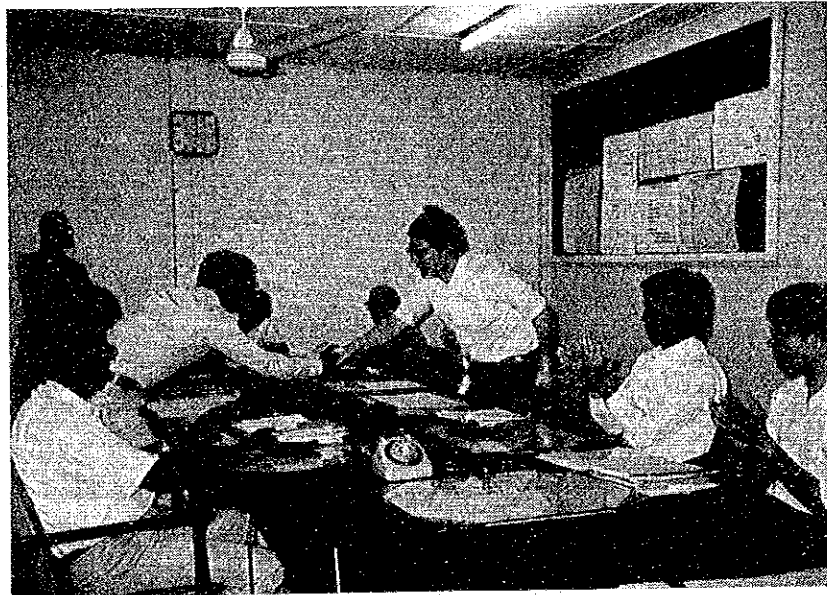
It may be concluded that both foremen and operators need training accordingly, the former should have a shorter course for each particular skill that they lack in while the latter should have a longer course including basic knowledge and skills in the basic machine tools.

資 料 VI

関 連 写 真



1 年次実施計画書の検討

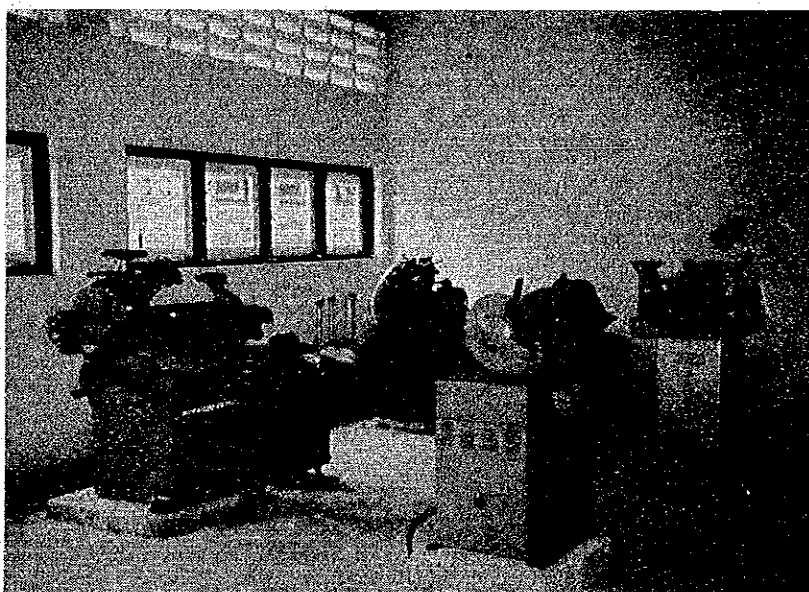


2 年次実施計画書の署名・交換
IDB長官及び鈴木団長、池田コロombo事務所長

3 センター内部



58年度供与機材



57年度供与機材

4 センター敷地内の試験農場



ヤシ、バナナ、コーヒーの混作



トマト

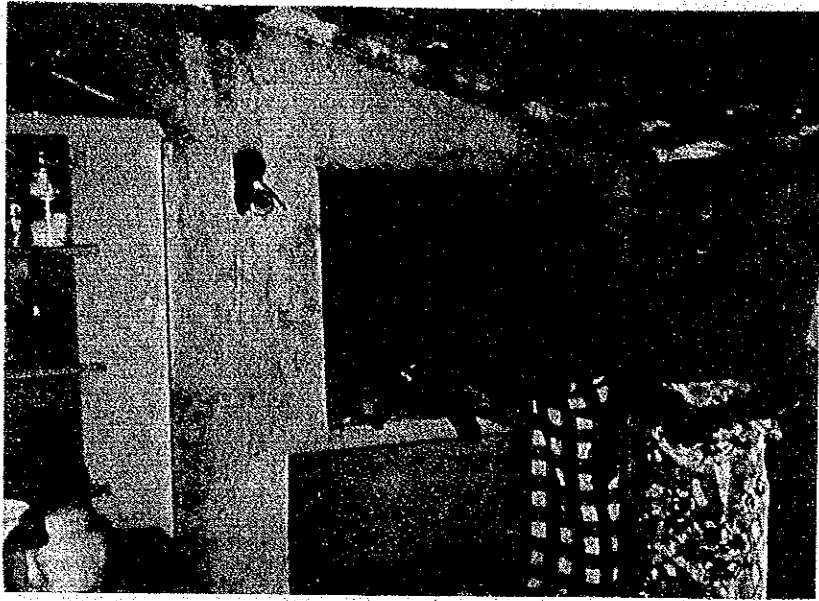
5 パンナラ周辺農家、工場等



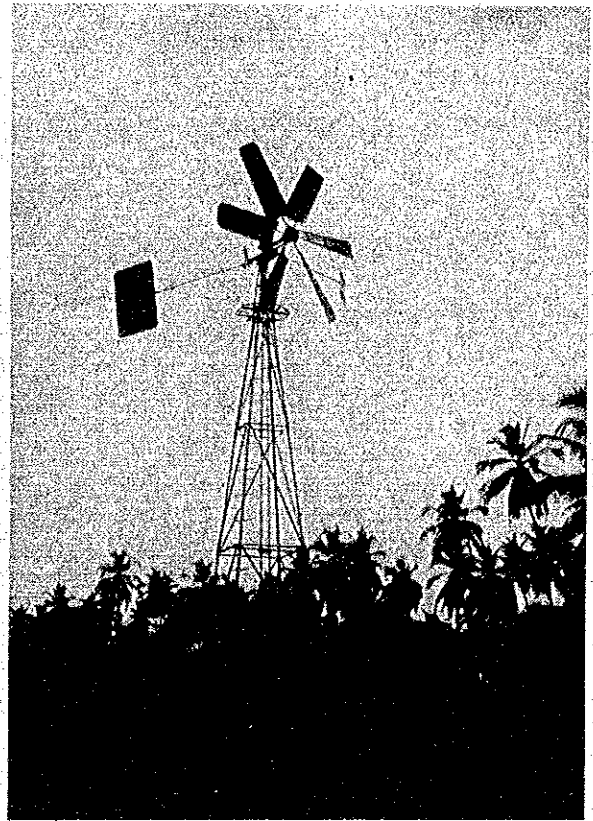
揚水用ポンプ（農園への散水用）
この動力源として燃料ガス発生装置を開発する



農家のバッテリーテレビ



農家の台所



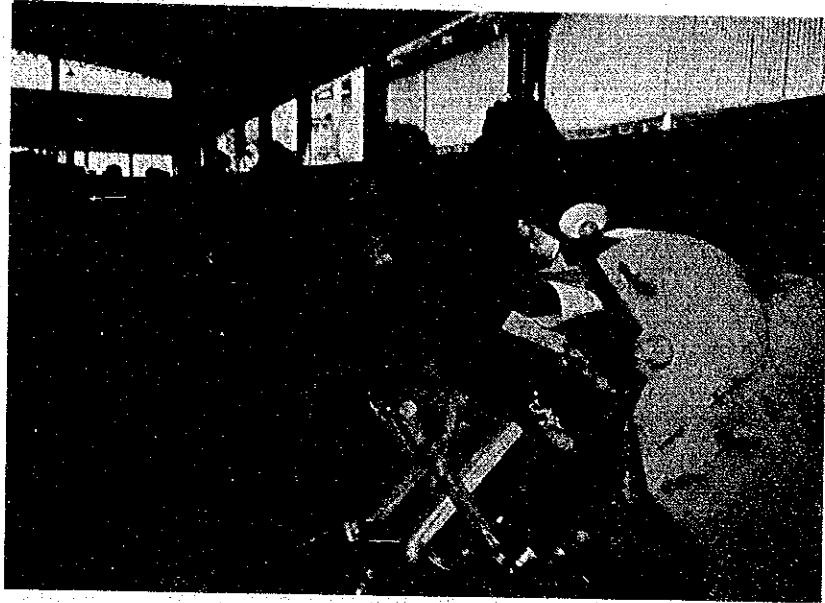
牧場にある揚水用風車



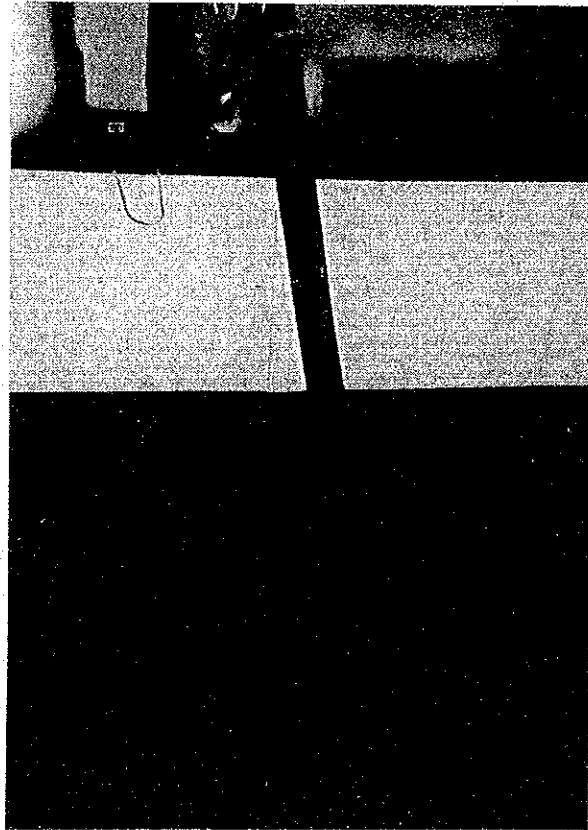
Hardware Corp., (農機具製造工場)
機械は中国製



Hardware Corp.,
鋤の刃の部分を焼入れ



Hardware Corp.,
刃の部分の研磨



Hardware Corp., の製品

JICA