インドネシア養蚕開発計画
計画打合せチーム報告書

昭和59年４月

国 際 協 力 事 業 団

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はじめに

インドネシア養蚕開発計画は，昭和５３年２月２８日に締結されたインドネシアとの養蚕の分野における技術協力協定に基づき５カ年間協力事業が実施された後，さらに２カ年間「討議議事録」（Ｒ／Ｄ）により協力が継続されている。事業内容は養蚕センター，副センター及び農民グループにおいて桑栽培，蚕飼育に係る実用試験並びに実証試験，蚕種製造・配布，技術職員及び農民の訓練，養蚕技術の演示等である。

本計画打合せチームは，昭和５８年３月にＲ／Ｄにより延長された２カ年間の協力期間の事業計画について，インドネシア側関係者並に派遣専門家と打合せを行ない，併せてモデルインフラ事業として建設する乾繭施設の候補地を調査するために，島田俊弘農林水産省農蚕園芸局蚕業課補佐を団長として昭和５８年１１月２７日から１２月１４日までインドネシアに派遣された。この報告書は，これらの調査結果を取りまとめたものであり，今後プロジェクトの参考資料として広く関係者に活用されることを願うものである。

最後に本報告書を取りまとめられた島田団長始め団員各位に対し謝意を表するとともに，ご指導いただいた外務省，農林水産省並びにインドネシア国政府関係者各位に対して深甚なる謝意を申し上げる。

昭和５９年４月

国際協力事業団
農業開発協力部
部長　田　内　　尭

あ　い　さ　つ

インドネシアの養蚕開発プロジェクトは，１９７８年２月２８日に日本・インドネシア両国政府において締結された「インドネシアとの養蚕の分野における技術協力協定」に基づき，１９８３年２月２７日までの期間をもって実施され，その後Ｒ／Ｄにより１９８５年２月２７日まで期間延長されたものである。

今回の計画打合せチームは，延長Ｒ／Ｄ移行後におけるプロジェクト各部門の事業活動の進捗状況を把握し，残された期間における実行計画について検討協議を行うこと，開発技術等の普及教育に資するため製作中の視聴覚教材について現地打合せを行うこと，乾繭施設等の整備事業の実施について現地調査を行うと共に，イ側と事務手続き（Ｒ／Ｄ追記等）を進めること等を業務として命じられた。

今回のチームは３名の団員で構成され，１９８３年１１月２７日から１２月１４日までの１８日間，ジャカルタ及び南スラウェシ州の関係各地を訪問し調査等を行った。

インドネシアの養蚕開発は，プロジェクト活動の成果が着実に稔りつつあり，特に蚕種製造面における微粒子病のチェック，優良蚕種の供給体制の確立など見るべき実績を数多く挙げ，インドネシア側当局の評価も高い。本プロジェクトの拠点であるビリビリの養蚕センターの建物，施設は内部設備，重機器，機械が整備され，インドネシアカウンターパートが中心となって事業活動が行われつつある。

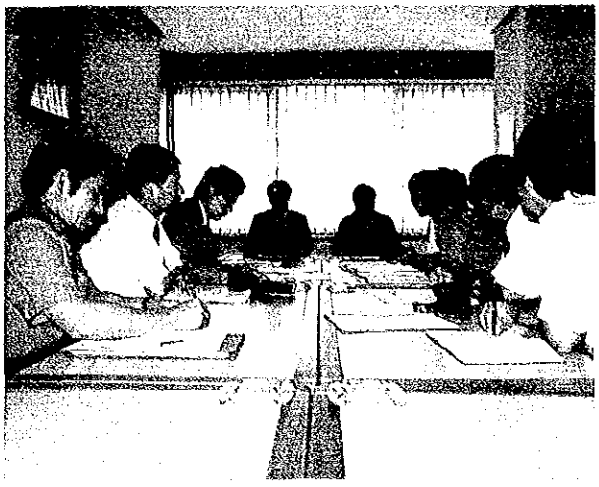
このように，本プロジェクト活動は協定終了に向って円滑に遂行されつつある。今後は確立された技術・方法を確実に実行していく体制づくり，物事を前向きに解決していく意欲或いは応用能力の強化等，人的な能力開発の面でインドネシア側の自主性の発揮，自助努力が大いに期待されるところである。今回の調査を通じて，インドネシア側の養蚕開発に対する前向きな取り組み姿勢，イ側技術者が日本人専門家のたてた計画に沿って誠実に努力・実行を重ねていることがうかがわれたが，協定が終了し，日本人が引き揚げた後における事業運営については，若干の不安を感じさせる様なことを見聞したからである。

我々の調査活動について，インドネシア政府の協力，在インドネシアの日本大使館，同領事館，ＪＩＣＡジャカルタ事務所の関係者には多大の御指導と御協力を頂いた。また現地の日本人専門家には調査旅行に同行していただく等の御支援を頂いた。これらの方々の御厚意に支えられ，無事大任を果すことが出来たことを団員を代表して厚く御礼を申し上げる。

養蚕開発プロジェクトの成果がインドネシア養蚕業の発展に寄与し，日・「イ」両国の親善関係の強化に大きな役割を果すこととなることを心から念願するものである。

昭和５９年２月

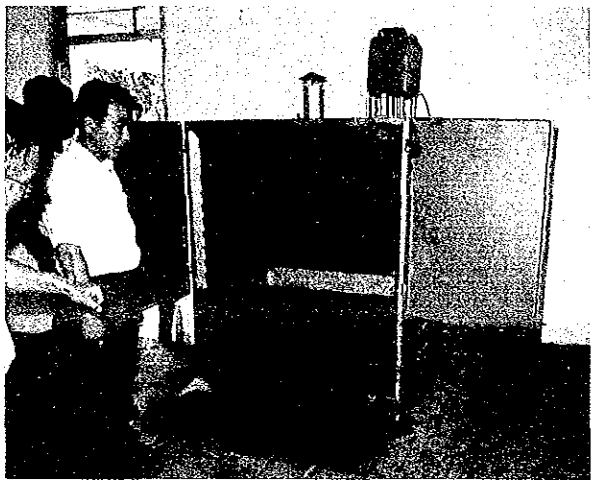
団長　島田俊弘



追記R／Dの調印式

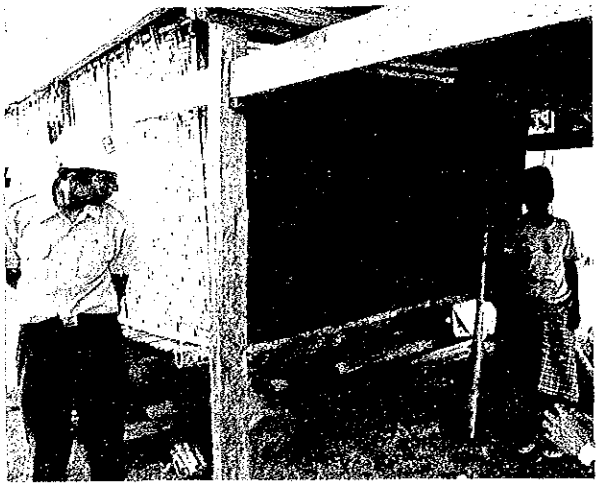
ウギ村の乾繭施設建設予定地

ビリビリ養蚕センターで開発した足踏式繰糸機



ビリビリ養蚕センターの簡易乾繭機

ビリビリ養蚕センター蚕種製造蚕室での給桑風景



パイロットユニット農家の貯桑場

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第１章　調査団派遣の経緯

1. プロジェクトの経緯

昭和４７年，南スラウェシを襲った大旱魃に続いて大発生した粒徴子病により大打撃を受けたインドネシアの養蚕業をたて直し，農民の就業機会の拡大，農家収入の増大を計るため，インドネシア政府はわが国に養蚕開発の協力を要請した。

これに応え，わが国は昭和４９年３月に予備調査団を，昭和５０年３月から１カ年間長期調査員３名を，昭和５０年１１月には実施計画調査団を派遣し協力内容・対象地域等を検討した。

これらの調査の結果に基づき昭和５１年３月協定に移行するための諸準備を行なうために討議々事録が取りまとめられた。協力が開始された当初のＲ／Ｄによる協力期間は１年６カ月であったが，５カ月延長された後，昭和５３年２月２８日に５カ年間の協定に移行し，協力が実施された。

昭和５７年９月にエバリュエーションチームが派遣され，これまでの協力成果の評価が行なわれた結果，昭和５８年２月２８日からＲ／Ｄによる２カ年間の協力期間の延長が決定された。

本プロジェクトの協力内容は養蚕センター，サブセンター，パイロットユニットにおいて桑栽培，蚕飼育に係る実用及び実証試験，蚕種の製造と配布，技術職員及び農民の訓練を行なうことである。

2. 計画打合せ調査実施要領

(1) 調査団派遣の目的

本調査団は，昭和５７年９月に実施されたエバリュエーション調査の結果に基づいてＲ／Ｄにより延長された協力期間の重点課題及びその到達目標につきプロジェクト関係者と打合せを行ない，併せてモデルインフラで予定されている乾繭施設に関する調査を行なうことを目的としている。

(2) 調査団員の構成

1. 団長（総括）　島田俊弘
   農林水産省農産園芸局　蚕業課課長補佐
2. 養　　蚕　　高宮邦夫
   農林水産省蚕糸試験場　企画連絡室連絡第一科長
3. 業務調整　　新田　節
   国際協力事業団農業開発協力部畜産開発課

3. 調査日程表

月 日		日程
11/27	日	東京 ——→ ジャカルタ
28	月	9：00 ＪＩＣＡ事務所訪問（山村所長，佐々木職員との打合せ）
		11：30 日本大使館表敬訪問（角谷一等書記官）
		13：30 林業省表敬訪問（Ir. Wartono Kadri 総局長ほか訪問）
29	火	9：00 ＪＩＣＡ事務所での打合（佐々木職員，富永調整員，チーム）
		11：00 林業省での打合せ（全体計画，及び追加Ｒ／Ｄに関する打合せ）
30	水	ジャカルタ ——→ ウジュンパンダン
12/ 1	木	8：15 日本人専門家との打合せ
		10：00 ビリビリセンター，プロジェクトマネージャー，カウンターパートとの打合せ
		14：00 パカトー桑園の見学
2	金	8：00 ビリビリセンター施設見学
		12：00 総領事表敬（星川総領書）
		13：30 視聴覚教材作成に関する打合せ（日本人専門家，チーム，小西，西田（ビスコ㈱ディレクター，カメラマン，カウンターパート）
3	土	ウジュンパンダン ——→ トラジャ（移動）
4	日	10：50 エンレカン桑園，大統領製糸工場訪問
		11：30 バラッカパイロットユニット調査
		15：00 ワニオパイロットユニット調査
5	月	9：00 サブセンター訪問（サブセンターＣ／Ｐとの打合せ及びディスカッション）
		10：00 サブセンター施設見学
		11：00 タナブランゲ飼育所の訪問
		12：00 ルパンゲ桑園，ルパンゲパイロットユニット調査
		13：00 ピソシンパイロットユニット調査
6	火	9：00 Wajo District Office 訪問
		11：00 ウギパイロットユニット調査
7	水	10：00 シドラップ製糸工場訪問
		11：00 バルーデモユニット訪問
8	木	日本人専門家との打合せ
9	金	ウジュンパンダン ——→ ジャカルタ （移動日）

月　日		日　　程
12/10	土	10：00　林業省にて「イ」側と協議及び追記R／Dへの署名
		12：00　JICA事務所での打合せ（山村所長，佐々木職員）
11	日	日本人専門家との打合せ
12	月	レポートの取りまとめ
13	火	日本大使館，JICA事務所　林業省表敬訪問
14	水	ジャカルタ　　東　京

4. インドネシア国面会者

（林業省）

Ir. Wartono Kadri

Director General of Reforestation and Land Rehabilitation,

Department of Forestry

Ir. Sutisna Wartaputra

Director of Regreening and Arable Land Control

Ir. Gunawan

Sub-Directorate of Regreeuing

Mr. Divio　局長秘書　（スチスナ局長付）

Mr. Tago F.　大臣官房計画局

Ir. Iman Sanusi

Silkworm Egg Production Section

Ir. Nur Hidayat

Sericultural Production Section

（ビリビリセンター及びサブセンター）

Mr. Yohanes Richard

Project Manager

Ir. Bambang Hartoko

Chief, Silkworm Rearing Section

Ir. Enjang Kuswiar

Chief, Moriculture Section

Drs Sucipto Hariyanto

Expent, Moriculture Section

Ir. Achmad Primon

Chief, Egg Production Section

Mr. Iyus Ramlan Ackub

Chief, Cocoon Testing Section

Drs. Ishak Ibrahim

Division Chief

Mr. Hatta Madjid

Chief, Guidance Section

Ir. Zulkarnaen Nurdin

Sub-Division Chief, Soppeng Egg Production Unit

Mr. A. K. Lukman

Expent, Soppeng Egg Production Unit

Mr. Baharuddiv Adam

Chief, Pilot Unit

Ir. Zito Sumardjito

Chief, Technical Der. Division

Ir. Simon Sampe Patasik

Chief, Extension Service

第２章　事業進捗状況と問題点

1. 要　約

１９８３年１月１９日に締結された新Ｒ／Ｄに基づく養蚕開発プロジェクトの事業進捗状況，今後の実行計画等についての把握，乾繭施設等の整備に関する現地調査の実施及び関係事務手続きの推進等の目的のため，１９８３年１１月２７日から１２月１４日まで，ジャカルタ及び南スラウェシ州の関係各地を訪問し調査打合せ等を行った。その結果を要約すると以下の通りである。

(1)　新Ｒ／Ｄ締結後の事業進捗状況と今後の問題点について

1)　プロジェクト活動は，ビリビリセンター及びサブセンターを拠点として，１９８２年に実施されたエバリュエーションで指摘のあった事項を中心とした養蚕技術の開発，インドネシアカウンターパートの養成，開発技術の演示体系の作成とデモ活動等は概ね順調に進められている。現在のところ，技術開発についての進度は一定の水準に到達して居り，所期の目的を達成しつつある。今後はなお未解決な部分についての研究開発に力を注ぐと共に協定終了に備えてインドネシア側の自主性の発揮を促進するべくカウンターパート等の要員の訓練，開発技術の農家段階への普及等について精力を注いでいる。

2)　問題点として挙げられることは，まず技術普及の面である。プロジェクトで開発された技術は，それを受け入れる農家の側の条件と大きなへだたりがあり，必らずしも円滑に普及が進んでいない。パイロットユニット農家についさえスムーズに行われていない。それは，現行の養蚕技術水準との較差が大きいこともさることながら，農民の理解力の問題，経済力の低さ，導入技術に附随する機材，資材の入手の問題，実行性等，農家・農民側の素地に起因する面が大きい。今後，かかる面に対応するには，普及を担当する部門の強化，即ち要員の資質向上，活動マニュアルの確立，普及指導施設（巡回指導用車輌）の充実組織体制の整備等が重要である。また，経営規模の拡大を容易にし，高度の技術の導入を可能とするところの背景を整えてやるような公的な援助，例えば融資事業の実施等の手だてが必要であろう。

3)　センターの運営に関し，発電機や冷蔵庫などの重機器の保守管理は基本的に重要である。今回の調査では揚水ポンプ，貯水そう，冷蔵・催青システム，発電機等の一部に故障の発生しているもの，サビ等が発生しているもの，スペアパーツの不足しているものがみられた。対応としてはイ側の機械担当要員の採用と訓練，十分な予算計上の努力や日本側専門家の派遣による教育等により早急に自主管理の態勢を作り上げる必要がある。

4)　蚕種製造問題については，基本技術を励行し，優良蚕種の製造がなされるよう管理体制を強化すること，特に責任体制を明確にし，カケ外れ等が数多く出ないようにする必

要がある。また，供給力の向上を図るため，製造能率のアップ，バラ種製造への移行，蚕卵台紙の調達，分場農家システムの導入等に積極的に取り組む必要があろう。なお，協定外であるが強健性蚕品種の育成等の課題も重要である。

5) 製糸技術については協定外であり，ほとんど技術協力はなされていない。ただ，繭の生産までで協力を止めるのは首尾一完性を欠き，インドネシア側では，製糸から織物に至るまでの一完した生産技術の協力を強く望んでいる。ただ，現在の南スラウェシ州全体での生糸生産量（１６.７トン１９８１／８２年）では日本の製糸技術をそのまま移転することは論外であるので，当面は，乾繭共同施設を設置した上での農民段階での繰糸方法の改良について技術協力を行う必要性はあるものと考える。

(2) 日本人専門家の派遣については，機器の保守管理関係，蚕の品種改良関係，農家の経営分析関係の各々の分野について要請があった。

(3) 視聴覚教材の作成に対する現地での注文は，利活用の面から教材のレベルをあまり高いものとしないこと，普及現場向き，技術者向きの各々の目的に沿い，現地の水準を考慮して作成する。副読本は写真より絵を多くする，等であった。

(4) 乾繭施設，給水施設等の建設予定地について現地調査を行い，乾繭施設３カ所，給水施設５カ所の各々候補地について日本人専門家と協議の上，優先順位付けを行った。

また日本側の負担において乾繭施設等の整備事業を実施する旨をR／Dに追記することにしたことを日本側，計画打合せチーム島田団長とインドネシア側，林業省Wartono 総局長との間でサインを行った。

2. 事業進捗状況と今後の問題点

１９７６年に開始されたインドネシア養蚕開発計画に基づく技術協力もすでに７年間を経過し，この間，日本側専門家及びインドネシア側関係者の努力により大きな協力の成果が得られている。なかでも１９８３年２月新R／D締結後のプロジェクト協力はピリピリセンターをはじめサブセンターにおいて，1) 桑園管理，桑栽培及び桑病害虫防除，2) 蚕飼育及び蚕病防，3) 優良蚕種の製造及び配布，4) インドネシアカウンターパートの資質向上，5) 開発技術の演示等の各項目について主としてすすめられているが，これまでの協力の成果から，その多くは一定の水準の技術開発がすでになされており，農家への開発技術移転等いくつかの問題点を除いて，ほぼ所期の目的を達成しているものと思われる。とくに現在の協力は１９８２年度エバリュエーションチームにより指摘のあったいくつかの未解決の問題の解決ならびに，これまでとり残されていた問題についての解決が図られているが，さらに残り少なくなった協力期間を考慮して，インドネシア側の自立を目的としたカウンターパート及びアシスタントの資質向上のための訓練や，パイロットユニットを中心としてセンター

で開発された技術の農家への導入のための努力に精力が注がれている。また今後の実行計画は，Joint committee ＡＴＡ－７２の第６回ミーテング協議結果にのっとって行われていることを確認した。

今回，計画打合せチームが調査した１９８３年１２月現在における技術協力の進捗状況を専門別に眺めてみると，各分野とも総合で７０～８０％の進度を示すものが多く，（第１表）技術協力は順調にすすんでいることがうかがえる。

1. 栽桑関係

現在，桑園への有機質施用，桑の栽植，多回育に適合した収穫体系，桑園管理の作業時間調査，害虫防除用殺菌剤，殺虫剤のスクリニング及び桑品種の選抜に関する試験等これまで実施されなかった部分の試験が行われている。しかしながら，トラクター等桑園用機械のパーツ補充や機械の保守管理の不備な点がみられ，この面での機械類の補充や専門家派遣等による技術指導の必要性が認められた。その他，桑園土壌改良並びに地力維持対策等，今後残された期間内で実施しなければならないいくつかの問題点も残されている。

2. 蚕品種及び蚕種製造関係

蚕品種性能維持，上蔟後の発蛾日数調査及びばら種蚕種の製造法に関する試験等が目下実施されているが，この分野における問題点としては，まず中国種系（ＢＣ系）の育成品種が最近とくに弱くなっており，センター及びサブセンターにおいて減蚕歩合が高く，この対策としては，短期専門家の派遣等による強健性ＢＣ系蚕品種の育成を早急に行う必要のあることが認められたことと，インドネシアでは浸酸に適する産卵台紙がないため，この対応策としてはインドネシア国内において利用できる適当な産卵台紙を見つけること並びに産卵台紙のいらないバラ種蚕種の製造技術を早急に確立する必要のあることが認められた。一方，インドネシアにおける蚕種製造体制について，原々種及び原種の製造を中心に行うビリビリセンターと交雑種の製造を中心に行うサブセンターの分担関係を明確して，特に原々種や原種の製造を行う場所においては微粒子病検査の徹底を図り病原フリーの優良蚕種の製造を行うようにする必要がある。このためには，蚕種製造における病毒検査や製造場所の指定等については法的な規制を行うことも必要と考えられる。

3. 蚕飼育関係

現在，現地製防乾紙を用いた補湿防止資材の方法の開発，蚕病防除のための現地で入手できる薬剤の検索，竹蔟による上蔟方法の改善及び繭糸質検査法の開発等の試験がなされている。この分野において特記すべき問題点としては次の２つがある。その１つは，インドネシアで多発するコウジカビ病，膿病及び微粒子病等の蚕病防除法の開発である。蚕種製造場面における微粒子病防除の徹底を図るための技術確立は勿論であるが，この国においては消毒薬剤としてホルマリンを使用しなくて高度さらし粉が使用されている。また蚕

飼育場所が高床式住居の床下で行う場合が多いため消毒の徹底が図られないため，コウジカビ病や膿病の伝染性の蚕病による被害が高率にみられることや，また内部汚染繭による繭糸質等の低下原因ともなっており，今後，残された期間内において，飼育場所も含め，蚕病防除のための消毒方法や消毒薬剤の検索等早急に解決する必要がある。次の問題点としては，繭糸質検査法の開発である。現在，この点についてはほとんど試験がなされておらず，農家で産出する生糸は品質が著しく劣り，市場においては製糸工場等で産出される生糸に比し著しく安値で取引されている。今後は繭糸質検査項目の決定や地域別繭糸質の比較などを行い，品質のよい生糸を産出するための手だてを早急に行う必要がある。

4. インドネシア側技術者の資質向上訓練，インドネシア側カウンターパート及びアシスタントに対する栽桑，蚕飼育，蚕種製造，病虫害防除等の各専門技術習得の訓練は，これまでのわが国派遣専門家の長い努力の結果やわが国へのカウンターパートの研修等によりおおむね所期の目的を達成しているものと思われる。現在は，日本側専門家が引きあげた後，インドネシア側技術者により独自で試験研究や蚕種製造，さらには施設，機械等の保守管理等が行えるような訓練，すなわち，各専門技術のそれぞれについての技術開発試験の立案，取りまとめ等について重点的に訓練がなされている。しかし，施設の保守管理や，機械類の修理等では現在の派遣専門家では間に合わず，この面の訓練については，今後すみやかに施設機械等の専門家を派遣するか，或いはわが国への技術研修等により技術の習得をさせる必要がある。

5. 開発技術の展示

このことについては，技術協力の最終段階に入り，さきのカウンターパート等の訓練とともに重点的に技術協力活動がなされている。現在，年6回飼育に適合する収穫体系の地域適応性試験，標準技術体系の策定や栽桑，養蚕に関するハンドブックの改訂作業等がすすめられている。一方，これとは別に訓練及び普及活動のためのスライドの作製や副読本の作成もなされている。

専門家が特に力を入れているのは，開発された技術は直接農家にとり入れることが困難な状況にあり，如何にして農家に技術を導入することができるか，そのための限度技術を策定することである。開発された技術のレベルダウンによる農家に適合する技術を見出すことに苦労している。

この面での問題点としては，普及活動の貧困があげられる。現在の技術協力の中では協約にないため，普及活動はほとんどなされておらず，試験場での開発技術を農家につなぐパイプが欠落している。そのため，養蚕農家の実態調査や技術評価はあまりなされておらず，普及員の養成の問題とともに今後に残された大きな問題である。

6. 以上，協力の項目別に現在までの進捗状況と問題点について述べてきたが，ここで問題

点をいくつか列挙すると次のようである。

(1) 桑園病虫害及び蚕病防除

(2) 強健性蚕品種の育成

(3) 蚕種製造体制

(4) 施設及び機械類の保守管理

(5) 製糸技術

(6) 普及活動

(7) アシスタントカウンターパートの意欲の高揚

このような残された問題点は皆それぞれ解決を図るには今後もなお一層，多大の日時や人力等を要するものが多く，1年数ケ月間の残された協力期間内では到底解決することは困難なものばかりである。しかしながら，今後，残された協力期間内における問題解決のための専門家等の積極的な努力は勿論であるが，協力期間後においてもなお，未解決の残された問題については解決のためのわが国援助による何らかの手だてを早急に講ずる必要があると思われる。すなわち，具体的には，新R／D締結による協力期間終了後の1984年2月以降においてもなお専門家派遣による今後ともいくつかの問題解決の残された分野についてのfollow－upを続けていくか，或はまた新しい角度からの養蚕プロジェクトを組立て実施していくか，さらにはインドネシア側の自立を目的としたカウンターパート及びアシスタント等インドネシア側技術のわが国への研修等の実施による資質向上を図っていく努力をするなど，これらのいくつかの手だてを効果的に実行し，わが国のインドネシア国における養蚕開発プロジェクト協力の成果をほんとうに実りのあるものとしたいものである。

3. 進捗状況調査

表－1

プロジェクトの活動

注：＊はインドネシア側で主体的に実施する項目
（R／DのCooberation Programmeに含まれていないもの）

テーマ	初年度	2年度	終了ないしは実施中の小項目と進度（%）	未着手項目	問題点　総合進度（%）
1. 養蚕センター (a) 桑園管理	(1983/1984)	(1984/1985)	(2) 桑園管理の作業時間調査 （50%）	(1) 奨励桑品種の更新	農業機械のパーシ補充と保守管理 管理予算の計画的運用 計画的な改植 （85%）
(b) 桑栽培と桑園病虫害防止技術開発のための試験					
1) 桑園土壌改良	←	→	(1) 桑園への有機質の施用とその効果試験（40%） （a.稲わら，モミガラ，b.緑肥間作） (2) 肥料三要素試験（20%）	(3) 桑園における窒素の季節的消長	土壌改良並びに地力の維持対策 桑の無肥栽培法 （75%）
2) 桑園病虫害防止技術	←	→	(1) 桑病害虫防除の殺菌剤殺中剤のスクリーニング（50%）	(2) 耕種的防除と殺虫剤の併用による桑主要害虫の防除法の調査	（85%）
			＊マリーノプロジェクトの桑病害虫調査		桑病害虫防除法の確立 （75%）

テーマ	初年度	2年度	終了ないしは実施中の小項目と進度（%）	未着手項目	問題点　総合進度（%）
3）稚蚕・壮蚕桑園の収穫法と訓練	(1983/1984)	(1984/1985)	(1) 桑の植付密度（a.栽植距離，b.密植桑園）（７０%） (2) 年６回飼育に適合する収穫体系（８０%） (3) 枝条の生長特性と収穫量のデーター集積（５０%） ＊桑品種第２次選抜（６０%）		株直し器具と仕立法の検（８０%）
・ 桑品種の経済性の検討			＊(1) 熱帯高冷地向桑品種の選抜（３０%） ＊(2) 熱帯高冷地における枝条の生長特性と収穫量（５０%）		桑の収穫適期と蚕飼育時期の設定 熱帯高冷地桑園周辺の防風林の設置（６５%）
(c) 蚕飼育の技術開発試験 1）蚕品種の性状			1. 交雑組合せ能力の検定（５０%） 2. 品種の性能維持（５０%） ＊強健性品種の育成（１０%）		（８５%） 強健性ＢＣ系品種の育成
2）蚕種の保護取り扱い技術			1. 人工越年種保護試験（３０%） 2. ばら種保護取扱法（１０%）	3. 蚕種の輸送法	ばら種大量調整法保護法 種繭輸送方法（８０%）
3）上簇技術と繭質改善			1. 竹簇による上簇方法の改善（６０%） 2. 発蛾調査（９０%）		熱蚕振り込み方法の開発（７０%）
・ 稚蚕飼育法			＊現地製防乾紙を用いた場合の補湿方法と稚蚕の育ちとの関係（９０%）		簡易な補湿方法の考察（９０%）

テーマ	初年度	2年度	終了ないしは実施中の小項目と進度（%）	未着手項目	問題点　総合進度（%）
• 壮蚕飼育法	(1983/1984)	(1984/1985)	＊壮蚕用桑凋防止資材と方法の開発（８０%） ＊簡易壮蚕蚕室の改良（５０%）		被覆資材の検索と散水の是非について現地で簡単に建設できる蚕舎の試作（７０%）
病虫害防止法	←	→	＊蚕病防除のための現地で入手できる薬剤の検索（９０%） ＊ほこり添食による蚕病病原の検索（６０%）		（９０%）
繭検査 (d) 蚕種製造とサブセンターへの配布	←	→	＊繭糸質検査法の開発（５０%）		繭糸質検査項目の決定と地域別繭糸質の比較（５０%）
1) 蚕種製造	←	→	1. 原種の生産と副センターへの配布（５０%） 2. 蚕種製造方法の改善－ばら種製造－（１０%）		浸酸に適する産卵台紙（８５%） 雄蛾染色剤
2) 蚕種製造計画	←	→	農家の需要に見合う蚕種製造計画の策定（５０%） ＊熱帯高冷地における原蚕飼育と蚕種製造（１０%）		（８０%）
(e) インドネシア技術スタッフの訓練 1) カウンターパートの訓練	←	→	1. カウンターパートの栽桑技術開発能力の向上（栽，７５%） 2. 飼育技術上の問題点の摘出とそれに対応する技術開発能力向上のための訓練（養，８０%）		（栽，８０%） 問題点対応の具体化能力の向上（養） （養，７５%） （種，７５%）

テーマ	初年度	2年度	終了ないしは実施中の小項目と進度（%）	未着手項目	問題点　総合進度（%）
	（1983/1984）	（1984/1985）	3. 技術開発試験の立案，まとめ（種，60%） 4. アシスタントカウンターパートの資質向上訓練（栽，70%） 5. カウンターパートによるアシスタントカウンターパートの訓練（蚕，70%）（種，70%） 6. セクション間の技術協力（栽，50%，蚕，60%，種，60%）		アシスタントカウンターパートの意欲の高揚(蚕) 情報交換の不足（蚕）
(f) 蚕糸センター及びパイロットユニットで開発された技術の演示計画の策定	←	→	1. 年6回飼育に適合する収穫体系の地域適応性（栽，50%） 2. 年6回飼育標準技術体系の策定（蚕，80%） 3. 栽桑，蚕糸に関するハンドブックの改訂（栽，60%）（蚕，70%） 4. 訓練及び普及活動のためのスライドの作成（栽，85%）（蚕，80%）		地域別収穫適期と掃立時期の一律化（栽） 地域別年間掃立時期の決定（蚕） 普及員の資質向上（栽） 限度技術について記載する要あり（蚕） （栽，70%） （蚕，75%）
蚕糸サブセンター (a) 蚕糸センターで開発された技術の実証試験 1) 桑園病虫害防除技術	←	→	桑主要害虫の防除暦の作成（80%）		桑病害虫の予察（80%）

テーマ	初年度	2年度	終了ないしは実施中の小項目と進度（%）	未着手項目	問題点　総合進度（%）
• ソッペンにおける桑品種の経済性検討	(1983/1984)	(1984/1985)	＊1. 桑品種枝条の生長特性と収量のデーター集積（５０%）	＊2. 有機質施用量と桑の発育効果	試験桑の家畜害対策（８０%）
• 蚕品種の地域適合性試験	←	→	＊蚕品種の地域適応試験（３０%）		（８０%）
(b) 蚕種および桑苗の増殖と農民への配布					
1) 蚕種製造	←	→	1. 蚕種の大量製造（５０%）		（７０%）
2) さし穂製造と配布	←		2. M. Cathayana穂木園増殖とM. alba & cathayanaの穂木生産（５０%）		（８０%）
(c) 技術員，農民の訓練					
1) サブセンターでの技術員および農民の訓練のためのカウンターパートへの指導	←	→	1. カウンターパートに対する現地指導能力向上の訓練（栽，７０%）（蚕，８０%）		（栽，８０%）（蚕，８５%）

テーマ	初年度	2年度	終了ないしは実施中の小項目と進度（%）	未着手項目	問題点　総合進度（%）
(d) パイロットユニットにおける養蚕技術の演示のための指導	(1983/1984)	(1984/1985)			
1) 養蚕技術の演示の指導活動	←→		1. 普及員の栽桑技術の向上（栽，50%） 2. 飼育技術に関する指導（養，60%）		普及員の農家指導計画と実行（栽） 限度技術構想の具体化（養）（栽，70%）（養，65%）
2) 養蚕農民の実情調査	←→		3. 養蚕農家の実態調査（栽，50%）（養，50%）		（栽，75%）（養，50%） 低位生産地帯における病原検索を含む実態調査（養）
3) 養蚕農家の技術評価	←→		4. 養蚕農家の技術評価（栽，20%）（養，40%）		的確な技術評価と技術改善（栽） 評価結果の利活用（養） （栽，70%）（養，60%）

4. インドネシア政府への提言

SUMMARY OF THE ACTIVITIES ON THE JAPANESE CONSULTATION TEAM
FOR
SERICULTURAL DEVELOPMENT PROJECT IN INDONESIA

The Japanese Consultation Team, organized by Japan International Cooperation Agency, headed by Mr. Toshihiro Shimada, visited several places in Indonesia from November 27, 1983 to December 14, 1983 for the purpose of consulting and programming the activities of Sericultural Development Project and surveying the promising construction sites for cocoon drying facilities and so on.

During its stay in Indonesia, the Team exchanged views and had series of discussions with the Indonesian authorities concerned with the respect to the desirable measures to be taken for the successful implementation of the Project activities, and also surveyed proposed construction sites for cocoon drying facilities and so on.

As a result of discussions and survey, the Team and Indonesian authorities concerned recognized the importance as shown in the attached paper.

In closing, we would like to express our cordial gratitude to the Indonesian personnel concerned who extended their fullest supports to us in carrying out smooth study activities.

Jakarta December 10, 1983

Mr. Toshihiro Shimada
Team Leader
The Japanese Consultation Team for
Sericultural Development Project
in Indonesia

Members of the Consultation Team:

1) Leader	Mr. Toshihiro Shimada	Assistant Director, Sericultural Division, Agricultural Production Bureau, Ministry of Agriculture, Forestry and Fisheries (M.A.F.F.)
2) Sericulture	Dr. Kunio Takamiya	Chief, First Liaison Section, Research, Planning and Coordination Division, Sericultural Experiment Station, M.A.F.F.
3) Coordinator	Mr. Tadashi Nitta	Livestock Development Division, Agricultural Development Cooperation Department, Japan International Cooperation Agency

The following items were discussed and surveyed:

1) Project activities.
2) Utilization of the slide materials
3) Survey for the construction sites for cocoon drying facilities and other infrastructural facilities.
4) Dispatch of Japanese Experts.
5) Training of Indonesian Counterparts.
6) Equipment and machinery.

Project Activities:

Implementation of the Project activities is smoothly carried out based on programme made by the Sixth Meeting of the Joint Committee ATA-72 with the efforts of both sides, and steady progress was seen on the transfer of the technology from Japanese experts to their Indonesian experts in general. However, there are several problems to be solved such as disinfection of mulberry field, preservation of silkworm eggs, strengthening of breeding method and training of Guidance Technicians. Furthermore, we would like to request to the Project for their efforts in the maintenance ofmachinary e.g. refrigerator of Sub-center. On the other hand, the Team pointed out that self-help is essential to solve problems facing now.

Slide Materials:

With a view to diffusing and improving sericultural techniques of Indonesian personnel, slide materials are being prepared. Effective and efficient utilization of the materials is expected for implementation and extension works of the Project.

Cocoon Drying Facilities and so on:

Necessity of cocoon drying facilities and other infrastructural facilities were pointed out by the Project side. The Team surveyed the proposed construction sites and following results were compiled:

1) The Team consider that proposed construction sites were feasible for the construction of cocoon drying facilities and other infrastructural facilities.
2) The Team will decide the preferential order of above-mentioned sites based on the results of survey.
3) Final determination on the construction of cocoon drying facilities and so on will be made according to the results of survey and within the limits of the budget.

Dispatch of Japanese Experts:

Regarding the dispatch of Japanese Short Term Experts, the following requests were made:

1) Maintenance and repair of refrigeration systems and generators.
2) Maintenance and repair of intake pumps.
3) Maintenance and repair of agricultural machinery.
4) Silkworm breeding method.
5) General analysis of sericultural farm management.

Training:

The Project requested the Team to accept more Indonesian Counterparts to Japan. In addition, prolongation of training period is requested for effective counterparts training.

Equipment and Machinery:

The list of equipment and machinery will be prepared by the Project upon consultation with the Japanese Expert Team. The Team requested prompt procedure through the nomal channel.

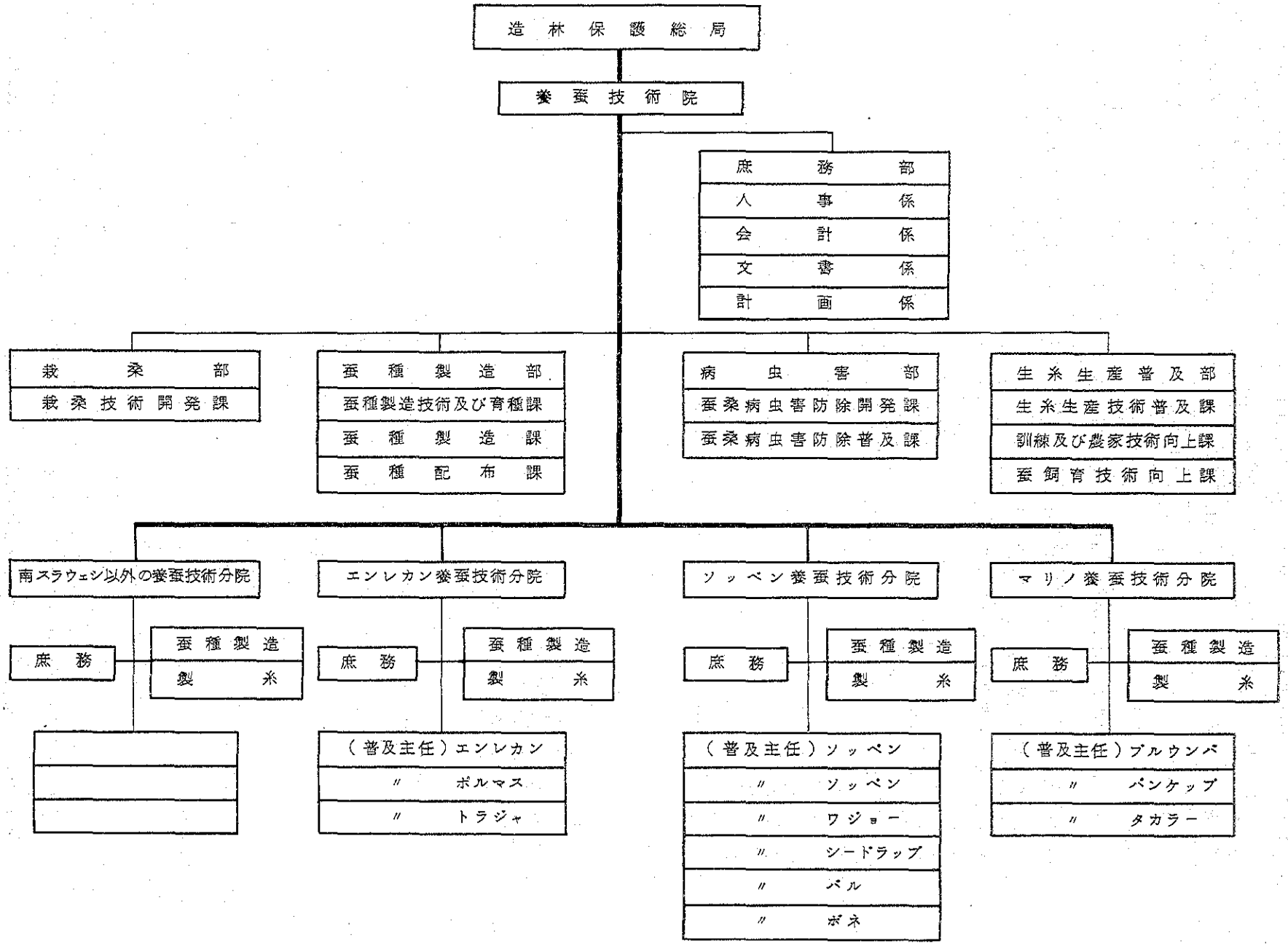
5. 新プロジェクト実施体制

プロジェクトの組織は，昭和５７年９月のエバリュエーション調査団の報告書に記載されているものと変わりないが，「イ」側は近くプロジェクトの組織を図１の通りの養蚕技術院に改正し，南スラウェシだけではなく全インドネシア養蚕業の研究・普及活動の中心とする構想を持っている。

養蚕技術院はその下に栽桑部，蚕種製造部，病虫害部，生糸生産普及部の４部をかかえ，エンレカン，ソッペン，マリノの養蚕技術院および南スラウェシ地域以外の養蚕技術分院をも統轄する予向である。インドネシア側によれば，ジャワスマトラに養蚕技術分院を建設し，南スラウェシで開発された技術を普及させたいとしている。

養蚕技術院組織図

図－1


造林保護総局
養蚕技術院
庶務部
人事係
会計係
文書係
計画係
栽桑部
栽桑技術開発課
蚕種製造部
蚕種製造技術及び育種課
蚕種製造課
蚕種配布課
病虫害部
蚕桑病虫害防除開発課
蚕桑病虫害防除普及課
生糸生産普及部
生糸生産技術普及課
訓練及び農家技術向上課
蚕飼育技術向上課
南スラウェシ以外の養蚕技術分院
庶務
蚕種製造
製糸
エンレカン養蚕技術分院
庶務
蚕種製造
製糸
（普及主任）エンレカン
〃 ボルマス
〃 トラジャ
ソッペン養蚕技術分院
庶務
蚕種製造
製糸
（普及主任）ソッペン
〃 ソッペン
〃 ワジョー
〃 シードラップ
〃 パル
〃 ボネ
マリノ養蚕技術分院
庶務
蚕種製造
製糸
（普及主任）ブルウンバ
〃 パンケップ
〃 タカラー

第3章　モデルインフラ整備事業調査

1. 乾繭施設要請の背景

(1) 建設の目的

インドネシアでは蚕の飼育を行う蚕室蚕具の消毒が十分なされておらず，これがコウジカビ病，膿病，微粒子病などの蚕病の原因となっていた。これはインドネシアの農家が，高床式となっており床下で蚕を飼育するため，ホルマリンなどを使った消毒が出来ないため，また消毒に使用する薬剤が高価であるためである。このような状況の中で蚕病を防止するには，蚕病のかたまりとも言うべき繭を蚕の飼育場所から分離することが必要である。

また蛾は結繭後2週程度で繭から出てくるので，蛾の出た繭の商品価値はなくなる。農家はこれまで所得額をより多くするため手廻しや足踏みの簡単な木製の繰糸機を使っていたが，殺蛹，乾繭のための乾繭装置がないため繰糸は収繭から発蛾までの数日間に限定されていた。繰糸しきれなかった繭は製糸業者に売却していたが，買いたたかれる場合も多かった。

このようなことからパイロットユニットに乾繭施設を建設し，乾繭することにより殺蛹し繰糸可能な期間を延長するとともに，熱により繭の病原菌を殺し飼育環境の浄化を計ることが計画された。

(2) 調査場所

乾繭施設候補地としてピッシン，ウギの両パイロットユニットを視察した。

パイロットユニットではないが今後の養蚕地帯として期待されるバルー村の視察も行なった。またの給水施設候補地として，バラッカ，ウギ，ピシン，ルパンゲ，ワニオの5つのパイロットユニットを視察した。

2. 乾繭施設給水施設候補地調査結果表

表－2

項目＼場所	Ugi Pilot Unit	Pissing Pilot Unit	Wanio Pilot Unit	Barraka Pilot Unit	Luppauge Pilot Unit	Madelo Barru
建設する施設	乾繭施設 給水施設	乾繭施設 給水施設	給水施設	給水施設	給水施設	乾繭施設 給水施設
建設予定地の状況	Mr. Usman 氏の所有地，資材の輸送にビラ川を利用	Tahir村長の物置を取りこわして乾繭棟建設予定	川の付近に稚蚕飼育所あり	付近の川から稚蚕飼育所まで３０m程度高低差１０mあり	稚蚕飼育所から３０mと８０mの所に井戸あり	－
土地の所有者	私有地 Mr. Usman 所有	私有地 Mr. Tahir 所有	私有地	私有地	公有地	公有地
付近の養蚕の状況	－	養蚕に熱心な村。	ワニオ村での糸の価格 座繰の糸RP20,000／Kg 製糸の糸RP25,000／Kg であり糸歩は座繰１５%，製糸１０%程度である。	２０戸の農家中１４戸が養蚕農家。 ２０ha桑園造成中。	桑園にコナカイガラの大きな被害があった。	桑園が新しく造成されつつあり今後，新しい養蚕地帯として期待される。
農家数	２０	２４	２８	１４	２５	－
掃立箱数（年）Box	１２３	１２０	４４	２１	８９	－
対箱収繭量	２０	２０.５	１６.２	２５	２０	－
飼育回数（年）回	5	5	3	3	5	－
繭の処理	工場（一部農家）	農家	農家	工場	農家	－
今後の見込み	村長が養蚕に熱心である。	村長が養蚕に熱心である。				大規模桑園造成あり

2. 乾繭施設，給水施設候補地調査結果

乾繭候補地として３カ所，給水施設候補地として５カ所のパイロットユニットを視察した結果は表２に示す通りである。これらの調査結果及びインドネシア側との協議結果にもとずいて，乾繭施設とパイロットユニットの給水施設の建設優先順位を表３の通りに決定した。

プロジェクトの日本人専門家はこの乾繭施設をインドネシアの養蚕農民に見てもらい，モデルにしてほしいとの意図から，インドネシアの農民でも手の届くような安価な建物としたいとの希望を出した。

調査団は，「イ」国の養蚕業の現状及びプロジェクトの希望を勘案しつつ，可能な限り現地に適した簡素な乾繭施設の建設を検討した。

乾繭施設は参考資料図２に示されているような構造とした。

表－３

優先順位表

場　　所	乾繭施設（優先順）	給水施設（優先順）
Ugi Pilot Unit （Mr. Usman）	② 私　有　地	② 私　有　地
Pissing Pilot Unit （Mr. Tahir）	① 私　有　地	③ 私　有　地
Wanio Pilot Unit	③ 国　有　地	⑤ 私　有　地
Barraka Pilot Unit	－	① 私　有　地 （買収可）
Luppauge Pilot Unit	－	④ 私有地又は 公　有　地
Madelo Barru	－	－

第4章　参考資料

JOINT COMMITTEE

O F

SERICULTURE DEVELOPMENT PROJECT

(ATA - 72)

Report of the Sixth Meeting

The sixth Meeting of the Joint Committee ATA-72 was held on October 27, 1983 at the Department of Forestry in Jakarta, attended by its members and representatives whose names are listed in the enclosed Reference Material No. 1.

1. Following the transfer of mandate authority of the project administration in the Government of Indonesia from "Department of Agriculture" to "Department of Forestry", the "Note of Understanding for Implementation of Sericultural Development Project in Indonesia (ATA-72)" - Reference Material No. 2 - was confirmed and agreed by Joint Committee members, subsequently signed by Ir. Sutisna Wartaputra, Director of Regreening and Arable Land Control and Mr. Hiroshi Yamamura, Resident Representative of Japan International Cooperation Agency (hereinafter called as JICA) in Jakarta.

2. Progress Report

Progress Report of Sericultural Development Project (hereinafter called as "the Project") - Reference Material No. 3, covering all achievements of the Project since the beginning of this cooperation period in 1976, was presented by the project Manager Ir. Yohanes Richard, and some additional information was given by Japanese Team Leader Dr. Nobuyuki Mori.

The contents of their reports can be summarized as follows :

1. Japanese Experts

A. The Government of Japan has dispatched 22 long term experts

since the start of cooperation period, and five of them are at present conducting technical guidance activities especially to their counterparts.

B. The Government of Japan has dispatched 30 short term experts as of the day of this Joint Committee Meeting, and some more short term experts are expected to be dispatched in this fiscal year 1983/84.

2. Project Budget of the Indonesian Government

The project budgets for the fiscal years 1982/83 and 1983/84 were as follows :

1982/83	:	Rp 703.560.000,-	- National budget
		Rp 28.000.000,-	- Provincial budget
T o t a l		Rp 731.560.000,-	
1983/84	:	Rp 550.347.000,-	- National budget.

These figures include overhead charges for project - employed personnels and allowances for Government employees.

3. Expenses borne by the Japanese Government

A. Supplied equipment and materials

The amounts of supplied equipment and materials in the fiscal year 1982/83 were ¥ 39,110,042.- (for those purchased in Japan) and Rp 28.889.810,- (for those purchased in Indonesia), consisting mainly of vehicles, cocoon testing equipment, agricultural machinery and silkworm rearing tools.

For the fiscal year 1983/84, the Government of Japan is expected to allocate about ¥ 40,000,000.- (estimated to cover purchases in Japan and in Indonesia).

B. Audio visual Education Material

Production of audio visual education materials (slides and supplementary books on sericulture) are now being

prepared by JICA-assigned specialists.
The budget for this is estimated to be about ¥ 9,000,000.-

4. Indonesian Experts and Technical Staffs

There are 19 Indonesian technical experts (counterparts) and 30 technical staffs jointly working together with Japanese Experts, as of the day of this Meeting.

5. Counterpart Training in Japan

As of the day of Joint Committee Meeting, 32 persons have participated in the training programs in Japan (two persons participated twice, thus counted twice each under the tachnical training courses) since the beginning of cooperation period in 1976, of which six persons have undergone observation tours.

* Since the submission of A-2,3 forms to the Government of Japan has been delayed considerably, JICA expressed regretfully that/by* the middle of November, 1983, it would be construed as abandoning the rights of training participation for this fiscal year 1983/84.
To this, Indonesian side expressed deep apologies and replied to the effect that they would precipitate confirmation of the application process with the Secretariat Cabinet.

6. Project Manager Ir. Yohannes Richard also reported the following achievements in the "Progress Report : Transfer of Sericultural Techniques".

A. Technical transfer from Japanese Experts to Indonesian Experts has been achieved quite successfully.

B. Number of Indonesian Experts who are conducting technical application activities for farmers is not enough, thus their activities are very limited at present.

* INSERT
should her Government fail to receive application forms

3. Activities of the Project (Working Plan) for the Year 1983/84

Activities of the Project for the year 1983/84 were proposed and approved by the Committee members - Reference Material No. 4.

4. Facing Problems and their Possible Countermeasures

" Facing problems and their possible countermeasures " - Reference Material No. 5 - was presented by Japanese Expert Team for smoother operation of project activities in the near future.
The Committee members discussed and recognized the importance of the mentioned matters.

5. Discussions

Following discussions were made on the reports, proposals and problems presented at the Meeting.

1. For the training of farmers, utilization of Forestry Training Institute (BLK) in Ujung Pandang may be considered.
2. It was proposed that sericultural extension activities might as well as be conducted more systematically like BIMAS Program.
3. Sericultural activities are also included in the Social Forestry Project being carried out in Bali, Yogyakarta, West Java (Garut), Bengkulu and West Sumatera.
   Support of the Project is needed in the supply of silkworm eggs and technical advice for strengthening the Social Forestry Project.
4. In view of the uncontrolled rearing and egg production of polyvoltine race still carried out, though quite rare, by farmers, Japanese Expert Team called for the necessity of implementing pebrine inspection regulation suggested by the Project, in order to avoid the danger of contamination by pebrine disease.

5. Japanese Expert Team insisted on the necessity of compiling accurate sericultural statistical data and information for the programming of reliable sericultural activity plans.

6. It was unanimously recognized that strengthening of extension service organization is extremely important to solve many facing problems such as uncontrolled polypoltine rearing, jaundice disease.

7. In order to produce bigger amount of pebrine free silkworm eggs with lower cost in the near future, the experiments of "Contract Farmer System", in which cocoons of parent silkworms are produced by farmers under the contracts concluded between the Project and selected farmers, should be started and carried out carefully.

8. In view of the troubles and difficulties the Project has been facing this year due to the delay in the processing of A-1, A-2,3, A-4 forms and PP-19, Japanese side called for the attention of Indonesian side that the processing of those documents should be accelerated.

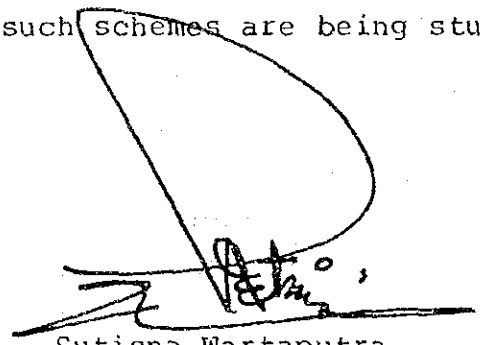
9. It was pointed out by Japanese Team Leader that none of those who participated in observation tours in Japan is now working with the Project or with any other sericultural related office/institution.

10. It was stressed by Japanese side that the maintenance of facilities, vehicles and machinery is very important for the smoother operation of project activities.
Though the budgetary situation is difficult at present, project activities might be seriously disturbed if proper maintenance and repair work would not be carried out efficiently.
In addition, the appropriate allocation of operation budget, especially for fertilizer, chemicals, rearing tools and materials, egg production materials and other consumable materials, is indispensable from next fiscal year.

6. Measures for the improvement of raw silk reeling in South Sulawesi

Japanese Team Leader called for more efforts on the part of Indonesian side to improve the reeling situation of farmers' groups, presenting "Measures for the improvement of raw silk reeling in South Sulawesi" - Reference Material No. 6, in which his suggestions were made as reference opinions.

Indonesian side replied that such schemes are being studied and materialized shortly.



Sutisna Wartaputra
Chairman
o f
The Joint Committee ATA-72

NOTE OF UNDERSTANDING FOR IMPLEMENTATION

O F

SERICULTURE DEVELOPMENT PROJECT IN INDONESIA

(ATA - 72)

Pursuant to the Record of Discussions signed by Ir. Apandi Mangundikoro, Director of Directorate of Reforestation and Rehabilitation, Directorate General of Forestry, Department of Agriculture and Dr. Masatoshi Kobayashi, Leader of the Japanese Implementation Survey Team, Japan International Cooperation Agency, on January 19, 1983, we, the undersigned, hereby acknowledge and confirm the contents of the above-said R/D and agree to abide by the Terms and Conditions stated therein for implementation of Technical Cooperation Programme on Sericulture Development in Indonesia, with the jurisdicial change to mandate authority of the Project administration in the Government of Indonesia from "Department of Agriculture" to "Department of Forestry".

Jakarta, October 27, 1983

Ir. Sutisna Wartaputra
Director of Regreening and
Arable Land Control
Department of Forestry

Hiroshi Yamamura
Resident Representative
Japan International Cooperation
Agency.

Ir. Hartono Kadri
Director General of Reforestation
and Land Rehabilitation,
Department of Forestry.

PROGRESS REPORT

TRANSFER OF SERICULTURAL TECHNIQUES .

I. Technical transfer Process .

Technical transfer process of sericultural to Indonesian experts has been done by :

1. Education and training in Japan for 6 or 8 months .
2. Training in Indonesia at Sericultural Project Bili-bili .

The activities during training in Bili-bili includes research and experiment together with Japanese expert team. Research and experiments include all activities such as ; mulberry cultivation , silkworm rearing , silkworm selection and pest and diseases controll .

Technologies taught to Indonesian expert were heavily emphasized in the basic of sericulture, so that they can carry out new methods or systems that are suitable to the Indonesian climate . Since training has been carried out using modern equipments and tools , activities can be performed smoothly by Indonesian experts.

Experiments were carried out at the Bili-bili Center and Soppeng Sub Center of Sericultural Project . 19 Indonesian experts and 33 technical staffs have been trained so far .

II. Result of the Technical Transfer .

Those research and experiments have been carried out :

1. Moricultural field .
   a. M.alba and M.cathayana are the mulberry varieties superior in the quality and productivity under the climatic and soil conditions of Indonesia .
   b. Fertilization (time , dosage , kind of fertilizer & method). By applying 200 kg of Urea per Ha , leaf production can be increased to 22 tons/Ha/year.
   c. Cutting system of mulberry, tools used, harvesting system for respective stage of silkworm .
2. Silkworm rearing .
   a. Rearing of young silkworms and grown silkworms must be performed separately .
   b. Mulberry fields for young and grown silkworms should be especially prepared separately .
   c. Mounting techniques , improvement of rearing and cooning tools.
3. Pest and Diseases control .
   a. Countermeasures againt pest and diseases in rearing rooms, on tools and of mulberry .

b. Countermeasure againts silkworm diseases by desinfecting rooms , tools and silkworm bodies with calcium - hyphochlorite .

c. Countermeasures againts main pests of mulberry by applying cultural techniques combined with insecticide such as basuddin 60 EC, used machine oil ect .

4. Production of Silkworm eggs .

a. Selection and hybridization between Japanese and Chinese bivoltine races and local races. Project now obtains 15 parent stock namely 8 BN races and 7 BC races .

b. Production of F_1 hybrid eggs six time a year .

c. Testing of pebrine by examining grand mother and mother moths individually or in a group from which silk worm eggs were produced for the use of farmers.

d. Distribution, incubation and hakitate time adjusting etchniques .

5. Cocoon Testing .

The original aim is to improve quality of raw-silk produced by farmers by testing it .

a. How to select cocoon .

b. Drying and storing techniques of cocoon .

c. Method of boiling and reeling .

d. Selection and improvement of traditional apparatus and drying machine .

III. Application of Sericulture Technique .

High and modern sericultural technologies have been transferred to Indonesian experts step by step. With the fundamental sericultural technologies obtained , the development of Indonesian sericultural industry is now depending upon the works of Indonesian experts .

Application of sericulture techniques to the farmers will be carried out by guidance technicians (about 50 persons) through Pilot Unit and Demontration Units. Beside this , the direct training of farmers is important .

Research of some silkworm rearing trials show that the cocoon productivity in South Sulawesi varies from Kabupaten to Kabupaten , and generally not at satisfactory level .

Location	Cocoon product(kg/box)	
	Variation	average
1. Bili-bili (Project)	29,7 - 34	31
2. Pilot Unit(Project)	13 - 31	21
3. Soppeng (farmers)	8 - 18	13,7
4. Sidrap (farmers)	15 - 17	15,7
5. Wajo (farmers)	16 - 19	17,5
6. Enrekang(farmers)	20 - 30	25

Above table shows that farmers' productivity is much poor compared with the productivity of the project .

It means that utilization of sericultural techniques by farmers is still low.

IV . Problem and Proposal .

Result of the experiment of sericultural technology to be introduced to the farmers carried out at Bili-bili Sericultural Center, showed the good harvest obtaining the cocoon production about 31 kg per box of eggs . Quality of raw-silk was good enough , and the controll of pest and diseases of silkworm was effective . However, we still have problem in our project :

1. Number of Indonesian experts, especially in the field of silkworm rearing is not enough compared with the need of personnel in the technical application to the farmers . Since their experiments are only rarely carried out at the rearing places of the farmers , application of advanced sericultural techniques is performed not so smoothly too.
2. Improvement in the technical level of guidance technicians is still needed .
3. Cost of silkworm eggs produced by the Project is too high amounting Rp 10.500,- per box, so that farmers can not afford to buy.

   To solve this problem, experiment of cooperation with farmers is needed to produce silkworm eggs with lower cost .

MATERIALS FOR THE SIXTH JOINT COMMITTEE MEETING

OF

SERICULTURAL DEVELOPMENT COOPERATION PROJECT

Dear sir,

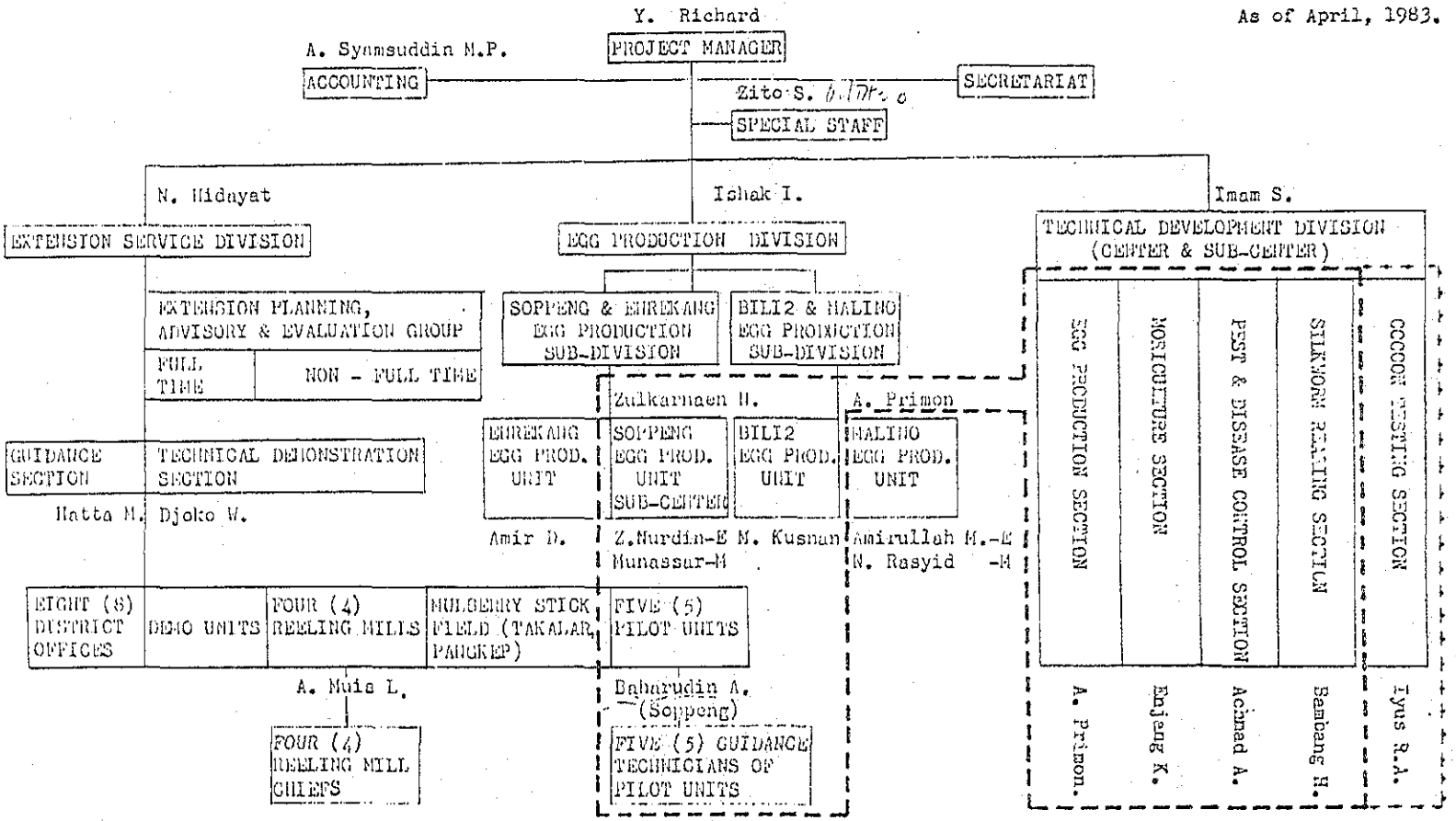
Attached materials are revised and/or additional information as of August, 1983.

For other information, please refer to the " Integrated Report " or " Laporan Umum " compiled by the Project as of February, 1983.

Thank you.-

ORGANIZATION CHART OF SERICULTURAL DEVELOPMENT PROJECT

As of April, 1983.



(REMARK)

(1) Names are Division, Sub-Division and Section chiefs only
(2) E - Egg production chief
(3) M - Mulberry field chief
(4) ATA-72 (Inside dotted line).

Table V-5 Budget of the project since the start of the cooperation.

Fiscal Year	Indonesian budget (including National & Provincial Project, ATA-72 and Presidential Aid & salary for employees).	
1976/77	Rp. 121,060,000,-	National budget
	Rp. 7,518,760,-	Provincial budget
	Rp. 180,000,000,-	Presidential Aid (Reeling & egg production facilities)
	Rp. 308.578,760,-	(Total)
1977/78	Rp. 380,301,000,-	National budget
	Rp. 17,500,000,-	Provincial budget
	Rp. 397,801,000,-	(Total)
1978/79	Rp. 439,735,000,-	National budget
1979/80	Rp. 373,485,000,-	National budget
	Rp. 15,000,000,-	Provincial budget
	Rp. 388,485,000,-	(Total)
1980/81	Rp. 328,618,000,-	National budget
	Rp. 33,875,000,-	Provincial budget
	Rp. 10,000,000,-	Forestry tax distribution
	Rp. 372,493,000,-	(Total)
1981/82	Rp. 494,118,000,-	National budget
	Rp. 35,000,000,-	Provincial budget
	Rp. 35,000,000,-	Forestry tax distribution
	Rp. 564,118,000,0	(Total)
1982/83	Rp. 703,560,000,-	National budget
	Rp. 28,000,000,-	Provincial budget
1983/84	Rp. 550,347,000,-	National budget

LIST OF COUNTERPARTS for the year 1983/84

1. Division, Sub-Division & Section Chiefs and Indonesian experts.

* Concurrent post holder

DIVISION	NAME	SEX	POSITION	PLACE OF ASSIGNMENT	FIELD OF EXPERTISE	TRAINING in JAPAN	ASSIGNED DATE	ATA-72 NON-ATA
Manager	Yohanes Richard B.Sc.	M	Project Manager	Bili-bili Center	General Management		1980.10	
Technical Development	Ir. Iman Sanusi	M		-do-	Chief, Egg Prod. Section, JKT		1980.5	
	Ir. Bambang Hartoko	M	Chief, Silkworm Rearing Section	-do-	Silkworm rearing	1981.5.5 -11.8	1979.5.2	
	Drs. Wariso Partodinomo	M	Expert, Silkworm Rearing Section	-do-	-do-	-do-	1980.12.23	
	Ir. Achmad Anwar	M	Chief, Pest & Disease Control Section	-do-	Pest & Disease Control	1980.5.29-11.28	1978.10.1	
	Ir. Enjang Kuswiar	M	Chief, Moriculture Section	-do-	Moriculture	1980.5.29-11.28	1978.10.23	
	Drs. Sucipto Hariyanto	M	Expert, -do-	-do-	-do-	1983.3.5 - 8.23	1981.11	
	Mr. Munassar Simbung	M	Chief, Soppeng mulberry field	Soppeng	-do-	1981.5.5 -11.8	1981.4.1	*
	Ir. Achmad Primon	M	Chief, Egg Production Section	Bili-bili Center	Egg Production	1980.5.29-11.28	1979.8.8	*
	Ir. Bertha Sampe	F	Expert, -do-	-do-	-do-	1981.5.5 -11.8	1980.11.6	*
	Mr. Iyus Ramlan Ackub	M	Chief, Cocoon Testing Section	-do-	Cocoon Testing	1977.2. -9	1977.11.18	Partially ATA-72
Egg Production	Drs. Ishak Ibrahim	M	Division Chief	-do-	Egg production management		1973.1.1	
	Ir. Achmad Primon	M	Sub-Division Chief, Bili-bili/Malino Sub-Division	-do-	Egg Production	1980.5.29-11.82	1979.8.8	*
	Ir. Muhamad Kusnan	M	Chief, Bili-bili Egg Production Unit	-do-	-do-	1981.5.5 -11.8	1980.2.25	

DIVISION	NAME	SEX	POSITION	PLACE OF ASSIGNMENT	FIELD OF EXPERTISE	TRAINING in JAPAN	ASSIGNED DATE	ATA-72 NON-ATA
Egg Production	Ir. Amirullah Makka	M	Chief, Malino Egg Production Unit	Malino	-do-	1981.5.5 -11.8	1980.4.21	
	Mr. Nur Rasyid	M	Chief, Malino Mulberry Field	-do-	Moriculture	1978.3.10-10.31	1979.4.	
	Ir. Zulkarnaen Nurdin	M	Sub-Division Chief, Soppeng/Enrekang Sub-Division; Chief, Sop. Egg Prod. Unit	Soppeng	Egg Production	1979.3.2 -11.2 1982.5.25-11.5	1978.4.28	
	Mr. A.K. Lukman	M	Expert, Soppeng Egg Production Unit	-do-	-do-	1978.3.10-10.31	1979.4	
	Mr. Kadir Djajadi	M	-do-	-do-	-do-	1983.3.5 - 8.23	1981.4.1	
	Mr. Munassar Simbung	M	Chief, Sopeeng Mulberry Field	-do-	Moriculture	1981.5.5 -11.8	1981.41	*
Extension Service	Ir. Nur Hidayat	M						Partially Chief, Raw Silk Production Section, JKT ATA-72
	Mr. Hatta Madjid	M	Chief, Guidance Section	Bili Center	Pest & Disease Control	1979.3.2 -11.2	1978	Partially ATA-72
	Ir. Djoko Widardjo	M	Demonstration	-do-			1979.6.1	Partially Chief, Society Forest Section, JKT
	Mr. Baharuddin Adam	M	Chief, Pilot Units	Soppeng	Silkworm Rearing	1977.2. -9.	1977.11.18	
Tech. Dev. Division	Ir. Zito Sumardjito	M	Chief	Bili-bili Center	Moriculture	1979.3.2 -11.2 1982.5.25-11.5	1976.7.16	
Extension Service	Ir. Simon Sampe Patasik	M	Chief	Bili Center	-			

Technical Staff

DIVISION	SECTION	NAME	SEX	PLACE of ASSIGNMENT	FIELD OF EXPERTISE	TRAINING in JAPAN	○ ATA-72 × NON-ATA
Technical Development	Silkworm Rearing Section	Sarjuni Matola	M	Bili-bili Center	Silkworm Rearing		
		A. Faisal M.	M	-do-	-do-		○
		Ramli Latief	M	-do-	-do-		○
	Pest & Disease Control Section	Patahuddin	M	-do-	Pest & Disease Control		○
		Muhammad Basir	M	-do-	-do-		○
		Tri Prasojo	M	-do-	-do-		○
	Moriculture Section	Laraena	M	-do-	Moriculture		○
		Hamka Langka	M	-do-	-do-		○
		Baharuddin	M	-do-	-do-		○
	Egg Production Section	Edy Inartinus Kaligis	M	-do-	Egg Production		○
		Arifuddin S	M	-do-	-do-		○
	Cocoon Testing Section	Arifin Kamil	M	-do-	Cocoon Testing		△ Partially ATA-72
		Hamdani	M	-do-	-do-	1983.3.5-8.23	△ -do-
		Metty Thomas	F	-do-	-do-		△ -do-
Egg Production	Bili-bili Unit	Djohar Tahir	F	-do-	Egg Production		○
		Alimuddin	M	-do-	-do-		○
		Orpha	F	-do-	-do-		○
		Nadjib	M	-do-	Moriculture		○
		Cinca Ali	M	-do-	-do-		○
	Malino Unit	Manarsar Silaen	M	Malino	-do-		×
	Soppeng Unit	Naomi	F	Soppeng	Egg Production		○
		Dortje Biti	F	-do-	-do-		○
		Dortje Duma	F	-do-	-do-		○
		Patima Delais	F	-do-	-do-		○
		A. Suardi	M	-do-	-do-		○

DIVISION	SECTION	NAME	SEX	PLACE of ASSIGNMENT	FIELD OF EXPERTISE	TRAINING in JAPAN	○ ATA-72 × NON-ATA
		Makkasau	M	Soppeng	Egg Production		○
		Nur Salim	M	-do-	-do-		○
		Arifin	M	-do-	Moriculture		○
		Syarifuddin Mori	M	-do-	-do-		○
	Enrekang Unit	Amir Daus	M	Enrekang	Egg Production		×

3. Mechanical technicians

FACILITIES	NAME	SEX	PLACE of ASSIGNMENT	FIELD OF EXPERTISE	TRAINING in JAPAN	○ ATA-72 × NON-ATA
Refrigerator	Harmaeni Suhra Gellu	M	Bili-bili Center	Operation & maintenance of refrigeration system	1982.5.25-11.5	○
	Achmad Husain	M	-do-	-do-		○
	Syamsu Daud	M	-do-	-do-		○
	Sukardi H.	M	Soppeng	-do-		○
	Haruna Rasyid	M	-do-	-do-		○
	Jamaluddin	M	-do-	-do-		○
Pump, irrigation system	Srijono	M	Bili-bili Center	Operation & maintenance of pump & irrigation system		○
	Suparmin	M	-do-	-do-		○
	Rudin Usman	M	Soppeng	-do-		○
Farm machinery	Sirua	M	Bili-bili Center	Operation & maintenance of farm machinery		○
	Nuntung	M	-do-	-do-		○
	Arifin Kamil	M	Soppeng	-do-		○
	Damir Amril	M	-do-	-do-		○
	N. Same	M	-do-	-do-		○
	Nodi	M	-do-	-do-		○

VI-1-1 Long-term experts.

Table VI-1 List of long-term experts.

No.	N a m e	E x p e r t i s e	Period of assignment
1.	Dr. K. Aoki	Team Leader	1975.3.31 - 1976.3.30 (Bogor)
2.	Mr. T. Tsukuma	Silkworm Rearing	1975.3.31 - 1976.3.30 (Bogor)
3.	Mr. Takatori	Moriculture	1975.6.6 - 1976.6.5 (Bogor)
4.	Dr. K. Aoki	Team Leader	1976.11.25 - 1978.12.24
5.	Mr. H. Sumida	Egg Production	1976.11.25 - 1978.3.20
6.	Mr. M. Takatori	Silkworm Rearing	1976.11.25 - 1978.11.24
7.	Mr. S. Fujiwara	Moriculture	1976.11.25 - 1980.11.24
8.	Mr. J. Nakamura	Silkworm Rearing	1976.11.25 - 1980.11.24
9.	Mr. H. Funasaka	Liaison Officer	1978.5.2 - 1980.5.1
10.	Mr. H. Sugiyama	Egg Production	1978.6.20 - 1980.6.19
11.	Dr. H. Inoue	Pest & disease Control	1978.6.20 - 1980.6.19
12.	Dr. N. Mori	Team Leader	1979.1.12 - 1983.2.27
13.	Mr. O. Ihara	Egg Production	1980.6.6 - 1982.6.5
14.	Mr. Y. Abe	Pest & disease Control	1980.6.6 - 1982.6.5
15.	Mr. K. Tominaga	Liaison Officer	1980.6.6 - 1983.2.27
16.	Mr. S. Nishi	Silkworm Rearing	1980.11.14 - 1983.2.27
17.	Mr. M. Yamamoto	Moriculture	1980.11.14 - 1983.2.27
18.	Mr. Y. Yoshimura	Egg Production	1982.5.25 - 1983.5.24
19.	Mr. Y. Kubomura	Pest & disease Control	1982.5.25 - 1983.5.24.
20.	Mr. T. Takasu	Silkworm Rearing	1983.2.11 - 1985.2.27
21.	Mr. H. Shiokawa	Moriculture	1983.2.11 - 1985.2.27
22.	Mr. K. Nojiri	Egg Production	1983.5.10 - 1985.2.27

Table VI-3 Technical training in Japan

Years	Name	Training course	Remark, Period
1975/76	Miss Samsijah ボゴール養蚕センター勤務		Forestry Research Station, Bogor.
	Miss Koen Mariatin 林業企業公団養蚕担当者		Perum Perhutani
1976/77	Mr. Iyus Ramlan Ackub	Silkworm Rearing	
	Mr. Baharuddin Adam	Egg Production	
1977/78	Mr. Amidjono	Observation	1977.5.8 - 1977.5.25
	Mr. Jon Sudino	Observation	- do -
	Dr. Herman Haerumen	Observation	- do -
1977/78-1978/79	Mr. A.K. Lukman	Egg Production	1978.3.10 - 1978.10.31
	Mr. Nur Rasyid	Moriculture	- do -
1978/79-1979/1980	Ir. Zito Soemardjito	Moriculture	1979.3.2 - 1979.11.2
	Mr. Hatta Madjid	Pest & disease Control	- do -
	Ir. Zulkarnaen Nurdin	Egg Production	- do -
1979/80	Mr. Teguh Widjaya	Observation	1979.10.21- 1979.11.2
	Mr. Haji Andi Made Alie	Observation	- do -
1980/81	Ir. Enjang Kuswiar	Moriculture	1980.5.29 - 1980.11.28
	Ir. Achmad Anwar	Pest & disease Control	- do -
	Ir. Achmad Primon	Egg Production	- do -
	Mr. Sanusi Kesumaputra		Forestry Research Station
1981/82	Ir. Bambang Hartoko	Silkworm Rearing	1981.5.5 - 1981.11.8
	Ir. Amirullah Makka	Egg Production	- do -
	Ir. Bertha Sampe	Egg Production	- do -
	Ir. Muhamad Kusnan	Egg Production	- do -
	Drs. Wariso	Silkworm Rearing	- do -
	Mr. Munassar Simbung	Moriculture	- do -
1982/83	Ir. Zito Soemardjito	Moriculture	1982.5.25 - 1982.11.5
	Ir. Zulkarnaen Nurdin	Egg Production	- do -
	Mr. Harmaeni Suhra Gellu	Refrigerator system	- do -
	Ir. Rafiuddin Achlil	Observation	1982.7.6 - 1982.7.21
	Drs. Sucipto Hariyanto	Moriculture	1983.3.5 - 1983.8.23
	Dra. Siti Koestini	Pest & Disease Control	-do-
	Mr. Kadir Djajadi	Egg Production	-do-
	Mr. Onie Hamdani	Cocoon Testing	-do-

計 ３２名 {その他
Observation ６名 → 養蚕Project以外に移った。
２回２名

VI-3 Supplied equipments & materials

Table VI-4 Supplied equipments & materials.

Fiscal Year	Japanese budget-supplied equipment for ATA-72 only	Main equipments
1976/77	¥ 54,086,258	Vehicles; Fork lift; Buldozer; Tractor; Agricultural machinery; Sericultural tools & materials;
1977/78	¥ 165,744,383	Refrigeration & incubation facilities; Vehicle; Agricultural machinery; Laboratory instruments;
1978/79	¥ 41,583,560	Sericultural tools & materials; Laboratory instruments & chemicals; Agricultural machinery;
1979/80	¥ 114,393,220	Vehicles; Laboratory instruments; Purified water plant; Sericultural tools & materials;
1980/81	¥ 73,303,623 Rp. 4,832,900,- (Local Purchase)	Tractor, Laboratory instruments; Photocopy machine; Vehicles; Generators; Distributor panels; Pebrine inspection machines; Agricultural machinery;
1981/82	¥ 54,046,841 Rp. 2,961,000,- (Local Purchase)	Cocoon testing equipments; Vehicle; Agricultural machinery; Sericultural tools & materials; Spare parts for vehicles; Pump; Generators & Heavy machineries;
1982/83	¥ 39,110,042 Rp. 28,889,810,- (Local Purchase)	Vehicles; Cocoon testing equipments; Laboratory instruments & chemicals; Sericultural tools & materials; Agricultural machinery;
1983/84	¥ 40,000,000 (including local purchase)	

合計 6億8千万円＋ＲＰ９９,０００,０００

（人件費，調査団，研修員経費を含まず）

Other planned Japanese Allocation for the year 1983/84.

1. Emergency countermeasure allocation.

(1) Construction of model cocoon drying and storage facility at farmers' groups.

Amount ¥ 2,500,000,-

(2) Production of audiovisual education materials (slides) and supplementary books on sericulture.

Amount ¥ 9,000,000,-

(including production expenses and supplied materials)

ACTIVITIES OF THE PROJECT

&

OTHER MATERIALS FOR

THE SIXH JOINT COMMITETTEE MEETING

ACTIVITIES OF THE PROJECT (PROPOSAL)

* To be carried out by Indonesian side

Theme	1983.3 - 1984.2	1984.3 - 1985.2	Contents
1. (SERICULTURAL CENTER)			
(a). Management of mulberry field	←———	———→	1. Renewal of mulberry Varieties. 2. Investigation on the working hours of mulberry field management.
(b). Traial experiments to develop techniques for moriculture and for the control of pests and diseases of mulberry.			
1).Promotion of soil fertility and techniques for the maintenance of mulberry field.	←———	———→	1. Study on organic manure muterials (green manure crop, husks) 2. Experiment on three macronutrients (N,P,K). 3. Seasonal distribution of nitrogen in mulberry field soil
2).Control method of mulberry pests and diseases.	←———	———→	1. Screening of insectisides adaptable to mulberry field. 2. agromonic-control of main mulberry pests and diseases. *. Ecology of mulberry pests and diseases in tropical high land.
3).Training and harvesting method of mulberry for young and grown silkworms.	←———	———→	1. Mulberry varieties and planting density. 2. Mulberry growth and rearing seasons. 3. Yield estimation of mulberry field. *. Mulberry growth and yield among mulberry varieties in tropical high land.
* Investigation on the ecomical character of mulberry variety.	←———	———→	*. Secondary selection of mulberry varieties based on economical characters. *. Selection of mulberry varieties adaptable to tropical high land.
(c). Trial experiments to develop techniques for silkworm rearing			

1) . . . . . .

Theme	1983.3 ~ 1984.2	1984.3 ~ 1985.2	Contents
1).Comparison of silkworm varieties	←———	———→	1. Breeding method of silkworm varieties. 2. Maintenance of the capability of silkworm varieties. *. Breeding of disease-resistant silkworm varieties.
2).Preservation and treatment techniques of silkworm eggs.	←———	———→	1. Method of artificial hibernation. 2. Preservation and treatment techniques of loose eggs. 3. Transportation method of silkworm eggs.
3).Silkworm mounting techniques and improvement of cocoon quality.	←———	———→	1. Improvment of mounting techniques using bamboo coconing frame. 2. Investigation on moth emergence.
* Rearing techniques of young silkworm.	←———	———→	* Humidity control method using locally procurable dump proof paper, and its relation with the growth of young silkworm.
* Rearing techniques of grown silkworm.	←———	———→	* Development of method and materials used for the wither protection of harvested leaves. * Improvement of simple rearing house.
* Control method of silkworm diseases and pests.	←———	———→	* Selection of locally procurable chemicals for silkworm rearing. * Bioassy of silkworm diseases.
* Cocoon quality test	←———	———→	* Cocoon quality test
(d). Production of silkworm eggs and distribution thereof to the Sub-Center			
1).Silkworm egg production.	←———	———→	1. Production of parent eggs and distribution thereof to the Sub Center. 2. Improvement of techniques for silkworm egg production
2)Scheme for silkworm egg production	←———	———→	1. Estimation of annual and seasonal egg consumption (boxes) consumed by sericultural farmers. * Rearing of parent silkworm in tropical high land.
(e). Training of Indonesian technical staffs.			
1).Training of counterpart.	←———	———→	1. Improvement of the ability to develop sericultural technique.

2 . . . . . .

Theme	1983.3 - 1984.2	1984.3 - 1985.2	Contents
			2. Training of assistant counterpart by counterpart.
			3. Cooperation and conciliation among sections.
(f). Formulation of program for the demonstration of sericultural techniques to be developed in the Center at the Pilot Units.	←	→	1. Readjustment of demonstration techniques. 2. Revision of hand book in sericultural techniques. 3. Production of color slides on sericultural techniques for training & extension activities.
2. (SERICULTURAL SUB-CENTER)			
(a). Verifying experiments of sericultural techniques developed in the Center.			
1). Control method of mulberry pests and diseases.	←	→	1. One year schedule for the control of main insect pests of mulberry field.
* Investigation on the economical character of mulberry varieties at Soppeng	←	→	* Survey on the characters of mulberry varieties. * Effect of organic matters on mulberry growth.
* Local adaptability test of silkworm varieties.	←	→	* Local adaptability test of silkworm varieties.
(b). Multiplication of silkworm eggs and mulberry scions, and its distribution to farmers.			
1). Silkworm egg production.	←	→	1. Mass production method of silkworm eggs.
2). Scion production and distribution	←	→	1. Enlargement of scion production field of M.cathayana and production of the scions of M.alba & M.cathayana.
(c). Training of technical staffs and farmers.			
1). Guidance of counterparts for training of technical staffs and sericultural farmers at the Sub-Center.	←	→	1. Improvement of the guiding ability of counterparts for the training of technical staffs and farmers.

(d) . . . . . .

Theme	1983.3 - 1984.2	1984.3 - 1985.2	Contents
(d). Guidance for the demonstration of sericultural techniques at the Pilot Units.			
1). Guidance activities for the demonstration of sericultural techniques.	←	→	1. Guidance on moricultural techniques. 2. Guidance on silkworm rearing techniques.
2). Survey on the actual condition of sericultural farmers.	←	→	3. Survey on the actural general condition of farmers through guidance technicians.
3). Technical assessment of sericultural farmers.	←	→	4. Evaluation of the technical situation of farmers.

FACING PROBLEMS AND THEIR POSSIBLE COUNTERMEASURES

By Sericultural Development Project — As of August, 1983

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
1.	Maintenance, operation and renewal of heavy fasilities & machinery		
	(1). Generators Bili-Bili Center 5 units Tajuncu 4 units Tanah Belange 3 units	a.Recruitment & training of mechanical technicians. Two persons should be placed for operation throughout a day. b.Allocation of enough amount of budget. c.Purchase of necessary spare parts domestically as much as possible. d.Periodical overhaul. e.Utilization of idle generators. f.Utilization of PLN electricity	a.Electricity is needed for 24 hours a day at Bili-Bili Center & Tajuncu for egg production activities. b.Enough spare parts were supplied in 1981/82. Stock is still enough.
	(2). Intake pumps Bili-Bili Center 2 units	a.Recruitment & training of mechanical technicians. b.Allocation of enough amount of budget. c.Purchase of necessary spare parts domestically as much as possible. d.Utilization of local mechanical technicians for the repair of pumps. e.Alternate operation of two pumps by making both of them in a good condition.	a.General repair was carried out by short term Japanese expert in 1980/81.
	(3). Water piping from intake to Bili-Bili Center. Bases of pipes are becoming weaker due to the erosion	a.Periodical inspection and reinforcement work-half yearly.	a.General reinforcement work was carried out by JICA in 1981/82.

No.	Problems (Importance)	Possible Countermeasures	Remarks & other information
	(4). Water treatment facilities at Bili Bili Center	a.Recruitment and training of mechanical technicians b.Allocation of budget for maintenance and purchase of chemicals used for water treatment. c.Shading of farm pond water in order to avoid the growth of algae. d.Filter portions should be inspected and cleaned or replaced in the near future.	a.Design of the roofing of farm pond has been made already
	(5). Irrigation pump and piping at Bili Bili Center 2 units	a.Recruitment and training of mechanical technicians b.Periodical inspection and repair. c.Periodical trial operation even if not used.	a.Piping was reinforced by JICA in 1981/82.
	(6). Refrigeration and incubation system. Bili-Bili Center 1 set Tajuncu 1 set a.Rooms of 5°C & 25°C are not stable in temperature	a.Recruitment and training of mechanical technicians b.Allocation of enough amount of budget. c.Since refrigeration system is extremely important for egg production, following measures should be taken for emergency. (a).Any generator should be able to supply electricity to refrigeration system. (b).Installation of refrigerator room at Pakatto. (c).Utilization of kerosene operated refrigerators.	a.As an emergency measure, two units of kerosen/electric refrigerators have been purchased by JICA

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
		d.In case of breakdown, prompt report should be forwarded to Bili-Bili Center.	
		e.Utilization of PLN elec - tricity.	
	(7).Pebrine inspection machines Bili-Bili Center 2 units Tajuncu 2 units	a.Avoid the troubles during inspection by conducting prior maintenance service	
	(8).Cocoon testing equipments at Bili-Bili Center. a.Inpection techni- ques are insuffi- cient.	a.Training on cocoon tes - ting techniques by short term Japanese expert. b.Equipments should be maintained so as to avoid rusting and must be operated carefully.	a.Short term Japanese expert is being requested now.
	(9).Deep well pump wa - ter supply system at Tanah Bellange	a.Periodical inspection & repair of facilities and pipes are necesssary.	
	(10).Vehicles & Motor bicycles	a.Generally old project vehicles should be main - tained & used carefully, so that even those old vehicles may be used longer.	a.Following A plus B requires about 23 units of vehicles and 20 units of motorbicycles.
	A.Transportation for mulberry field, rearing and egg production activities.	a.At least minimum number of vehicles should be retained for the activities of the project. b.Allocation of enough amount of budget for maintenance & fuel.	a.For the control of silkworm disease, same vehi - cles cannot be used for both mulberry leaf transportation and silkworm waste transportation.

No.	Problems (Importance)	Possible Countermeasures	Remarks & other information
	B.Transportation for other project activities within South Sulawesi.	a.Private use of the vehicles should be avoided as much as possible. b.Vehicles used for long distance travel should be especially maintained carefully. c.More motorbicycles are needed for the smoother performance of extension activities.	
	(11).Farm and heavy machinery a.Buldozer 1 unit b.Forklift 1 unit c.Tractor 3 units	a.Recruitment and training of mechanical technicians b.Daily maintenance & inspection. c.Local purchase of tractors	
2.	Problems on Silkworm egg production		
	(1).Egg production over 15,000 boxes a year. Present egg production facilities have the capacity of producing up to 15,000 boxes a year only.	a.Expansion of project facilities. b.Adoption of contract parent silkworm rearing farmer system. c.Import of lacking F_1 silkworm eggs. d.Demand of the eggs must be grasped as accurately as possible, so that planned production and supply system can be established	a.Due to the troubled mulberry leaf production, full scale egg production activities cannot be carried out for the time being at Malino egg production unit.
	(2).Unstable egg production within the project.	a.Reinforcement of the egg production administration of Project especially in Soppeng unit (Reshuffle of workers). b.Adoption of the responsibility sharing egg production organization.	a.Egg Production in the fiscal year 1983/84 is estimated to become around 12,000 boxes.

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
		c.Abilities of Indonesian experts, technical staffs and workers should be improved further so as not to make mistake in egg production & treatment activities.	
		d.Soppeng egg production unit should for the time being concentrate its efforts in the improvement of its own rearing and egg production activities only.	
		e.Make the responsibilities of each egg production unit clear, by putting the names of each production unit on the containers of eggs.	
		f.Thorough countermeasures for the control of silkworm diseases should be carried out in and around rearing houses.	
		g.Selection of more suitable chemicals for the prevention of silkworm diseases	
		h.Selection of more vigorous parent silkworm races.	
		i.Establish the system of mulberry leaf supply for egg production activities, by improving the productivy of mulberry field.	

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
3.	Lack of experienced personnel for the operation of sericultural development works including sericultural extension works.	a. Accumulation of experienced sericultural administration personnel and the strengthening of sericultural administration by providing training to the sericultural administration staffs. b. Sericultural related persons are desired to be placed as the in charge of sericultural administration in the Department of Forestry, and they should not be replaced so easily, because sericultural administration greatly differs from other agricultural or forestry fields	
4.	Low quality raw silk produced locally.	a. Necessity in the improvement of reeling should be considered.	
	(1). Lack of cocoon selection and poor cocoon treatment techniques.	a. Intensive training on the techniques of mounting, cocoon harvesting and cocoon selection. b. Intensive training on the handling & storing of fresh & heated (pupae killed by heat) cocoons.	
	(2). No difference in the price between superior quality cocoons & inferior quality cocoons.	a. Adoption of cocoon quality grading and price difference based on grading. Cocoon testing is advised to be carried out on the following items. (a). Reelability percentage (b). Length of cocoon filament.	

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
		(c).Raw silk percentage.	
		b.Establishment of cocoon marketing system.	
		c.Farmers should be convinced of the importance of cocoon quality improvement by employing particular reeling systems, i.e reeling at reeling center or at each farm house, in which cocoon quality directly affects the quality and the productivity of raw silk.	
	(3).Primitive reeling facility	a.Improved traditional reeling apparatus and relevant reeling techniques should be demonstrated at reeling center.	a.Traditional feet operated reeling apparatus is now being improved by project.
		b.Introduction of cocoon drier, cocoon selection table, rereeling apparatus and skein twisting apparatus.	
		c.Improvement of cocoon cooking container.	
	(4).Poor reeling techniques	a.By training reeling personnel at reeling center or other reeling facilities, production of standard quality raw silk should be made possible.	
		b.Diversion of fresh cocoon reeling to heat treated (pupae killed) cocoon reeling.	

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
	(5).No standard quality grading for raw silk thus no clear price difference between superior quality raw silk & inferior quality raw silk.	a.Adoption of localized simple method of raw silk testing, establishment of simple quality grading (about 3 grades) and the setting of price based on simple raw silk grading. b.By putting the names of producer on each produced raw silk in each sericultural unit, group marketing and grading should be accelerated. c.By selling raw silk directly to consumers, opinions of consumers can be obtained by producers. d.Strict grading of raw silk in the international market should be informed to sericultural farmers.	a.Simple grading is being used for raw silk marketing in some cases.
5.	Delay of the processing of necessary documents such as A1, A2,3 & A4 forms.	a.Prompt processing and earlier submission to Japanese Embassy are desired.	
6.	Making-up and disbursement of budget. (1).Lack of some important budget (fertilizer, vehicle operation etc).	a.Since the amount of Japanese supplied equipment becomes very small in the year 1984/85, most of the consumable materials should be purchased by Indonesian government.	
	(2).Disbursement of the budget is not well planed.	a.Planned and careful disbursement of budget is needed.	

No	Problems (Importance)	Possible Countermeasures	Remarks & other information
	(3).Some sericultural tools & materials are difficult to be purchased locally. a.Pruning scissors b.Egg laying paper c.Floss removing machines. d.Bleaching powder e.Formaline etc.	a.Utilization of locally available tools & materials as much as possible. b.For pruning scissars, comparison studies should be made between dowestically produced ones and imported ones.	

Prepared on Aug. 30, 1983

Prepared by,

Nobuyuki Mori

Nobuyuki Mori
Team Leader for
Japanese Expert Team.

MEASURES FOR THE IMPROVEMENT OF RAW SILK REELING IN SOUTH SULAWESI

Though the technical cooperation activities of ATA -72 cover up to the production of superior quality cocoons only, improvement of reeling techniques is also important. For the improvement of reeling techniques, I would like to state following reference opinions.

1. Reeling at reeling mills :

A drastic improvement of reeling by introducing highly advanced reeling machine is one of the ways to improve reeling techniques. Though this is in line with the policy of the government to promote industrialization, we can see following problems.

(1). Can we obtain enough quantity of cocoons to operate reeling mill efficiently ?

a. Medium size reeling mill requires about 1,000 tons of fresh cocoons per year. Efficient and economocal operation of reeling mill is difficult below 500 tons of cocoon supply per year.

b. Besides the reeling at reeling mill, sericultural farmers are reeling themselves at their houses, thus they have to secure cocoons for their home reeling.

c. Based on the above recognition, it is obvious that advanced reeling machine (if installed) must fall short of material cocoons unless 1,000 to 1,500 tons of cocoos are produced yearly and more than 500 tons of it go to reeling mill.

(2). Is automatic reeling machine needed ?

Manufacture of highly efficient automatic reeling machines has been motivated by the increasing labor cost in Japan. Therefore, I believe that it is more important in Indonesia to have the machines which are tough enough and easy to be maintained than cutting down labor cost, since comparatively cheap labors are available here.

Talking about the maintenance of fully automatic reeling machine, if once an automatic portion of automatic reeling machine is damaged, it usually cannot be repaired by the ordinary technicians of reeling mills even in Japan, much less in Indonesia having more disadvantages.

In consideration of such circumstances, it is advisable to introduce at most semi-automatic reeling machines or even multi-end reeling machines for the time being in Indonesia.

It is said that about 80% of reeling mills in the People's Republic of China, the biggest raw silk producing & exporting country in the world today, are using multi-end reeling machines.

2. How do we tackle with reeling activities until the introduction of mechanized reeling mills ?

——— Establishment of Reeling Center ———

We, of course, cannot leave the reeling situation as it is at present while the production of cocoons is not big enough i.e. 500 to 1,000 tons of cocoons cannot be secured for reeling mills.
As a countermeasure for the present reeling situation, we advise the setting up of a Reeling Center in every or several (2-3) Sericultural units (groups).
The purpose of such Reeling Center is to reel the cocoons produced by unit members together under one management and technique, whereas each farmer is reeling his own cocoons himself at present.

The advantages of such Reeling Center are ;

(1). Since each sericultural farmers does not carry out reeling activity in or around his rearing room, contamination of rearing room with silkworm disease pathogens caused by reeling can be avoided.

(2). By appointing the specialized reeling personnel who do not carry out silkworm rearing at the same time, the silkworm diseases brought in by reeling personnel can be avoided.

(3). By reeling in one place under one management and technique, the improvement in facilities and techniques becomes easier thus enable the production of standardized & improved raw silk possible.

(4). With big quantity of cocoons concentrated in one place, cocoon heating & drying facility can be installed, thus notably prolonging the possible reeling period and enabling the continuous reeling through the year.

(5). Standardized cocoon selection can be carried out.

(6). Standardized cocoon cooking can be carried out.

(7). Comparing to the cost in the mechanized reeling mill, this Reeling Center is gretly ecomical in construction, operation and maintenance.

Following facilities are needed in each Reeling Center.

Reeling apparatus (feet operated)	10 units	Rp. 1,200,000,-
Drier	1 unit	" . 250,000,-
Cocoon cooking apparatus	1 set	" . 200,000,-
Rereeling apparatus	1 unit	" . 150,000,-
T o t a l		Rp. 1,800,000,-

In addition to above facilities, water supply system and the place for the Reeling Center are required.

Reeling Center can be placed even under the elevated floor of farm-house, thaugh it is more ideal to construct or utilize an indepedent house.

We are proposing the introduction of improved traditional feet-operated reeling apparatuses now being improved at Bili-Bili Center into the Reeling Center, but of course it is also possible to continuously utilize old type reeling apparatuses as long as farmers wish for the time being.

One unit of improved feet-operated reeling apparatus, which is mechanically same as multi-end reeling machine, can produce some 500 grams of good quality raw silk per day with seven hour operation, meaning the production of around 5 kg raw silk and processing capacity of around 30 - 35 kg cocoons (in fresh cocoons) per day with 10 units of such apparatuses.

If 10 units of such reeling apparatuses are operated for 40 days (one rearing season), they can process around 1.2 - 1.4 ton of cocoons (in fresh cocoons) and produce around 200 Kg of good quality raw silk. This means that 7 - 8.4 tons of cocoons can be processed and around 1.2 ton of raw silk can be produced per unit per year with 240 days operation if silkworms are reared six times a year.

Based on above calculation, it is estimated that with 100 units of such Reeling Center, 700 - 800 tons of cocoons can be processed and around 120 tons of raw silk can be produced, if operated efficiently.

In addition, 100 units of Reeling Center is presumed enable to provide employment opportunities to 1,600 - 1,700 persons for more than 240 days a year.

Prepared on Aug. 30, 1983.

by,

JAPAN INTERNATIONAL COOPERATION AGENCY — SERICULTURE DEVELOPMENT COOPERATION PROJECT SOUTH-SULAWESI INDONESIA

Nobuyuki Mori

Mr. Nobuyuki Mori

Team Leader for

Japanese Expert Team.

Japanese supplied durable equipments as of Aug. 1, 1983. (Sericultural Development Project ATA-72)

Date of loading B/L number	Names of equipments	Quantity	Unit price ¥	Total price ¥	Placed at	Used by (Section, person)	Necessity	Utilization	Maintenance condition	Remark
	Place at : C – Center (Bili-Bili, Pakatto) SC – Sub-Center (Tajuncu, Tana Bellange) P.U – Pilot Unit (equally distributed) Used by : T.S – Technical sections in general R – Rearing section E – Egg production section P – Pest & disease section M – Moriculture section P.U – Pilot Unit (equally distributed) All sections – All sections including National & Provincial project. C.T. – Cocoon Testing Section Necessity : A – Extremely high (indispensable) B – High C – Better if existing D – Low Utilization : A – Sufficiently utilized B – Utilized normally C – Sometimes utilized D – Scarcely utilized Maintenance : A – Excellently maintained B – Well maintained C – No problem for the execution of activities though poorly maintained. D – Insufficiently maintained D – 1 Not utilized D – 2 No maintenance technician or no maintenance ability D – 3 No workshop D – 4 No maintenance budget Remarks : DX – Damaged, unrepairable (abandoned) Lost – Lost or stolen # Names of lacking spareperts should be stated if any									
March 5, 1977 B/L No. 506	Type – writer	1 unit	121,500,–	121.500,–	C	T.S	A	A	D	Too old
March 29, 1977 B/L No. 506	Mulberry chopping machine	2 units	68.000,–	136.000,–	C	1-R, 1-E	B	B	D	Too old
	Balance 100 Kg	2 units	52,000,–	104,000,–	1-C, 1-S.C	M	C	C	D	Too old
	Motor power sprayer	1 set	160,000,–	160,000,–	S.C	E	A	A	D	Too old
March 30, 1977 B/L No. 514	Mitsubishi H-J 26 H Jeep	1 unit	1.253,000,–	1,253,000,–	C	All sections	A	A	D	Too old
	Mitsubishi H-J 38 Jeep	2 units	1,550,000,–	3,100,000,–	C	All sections	A	A	D-4	Too old
	Mitsubishi T – 120 truck	1 unit	600,000,–	600,000,–	S.C	–	–	–	–	DX
	TCM FD50 Fork Lift Truck	1 unit	4,800,000,–	4,800,000,–	C	All sections	C	C	D-2	Too old
	Yamaha AG 100 Motorcycle	2 units	133,000,–	266,000,–	S.C	–	–	–	–	DX

1	2	3	4	5	6	7	8	9	10	11
	Massey Ferguson MF135 Tractor	1 unit	3,100,000,-	3,100,000,-	S.C	M	B	B	D-2	
	Atachment for MF135 tractor :	-	-	-	-	-	-	-	-	
	Disk plow MF80 (26" x 3)	1 set	510.000,-	510,000,-	S.C	M	B	C	D-2	
	Disk harrow MDH 1824 D	1 set	350,000,-	350,000,-	S.C	M	B	C	D-2	
	Broad caster MTB 350 300 ltr.	1 set	145,000,-	145,000,-	C	M	B	C	D-2	
	Front frame weight	1 set	70,000,-	70,000,-	S.C	M	B	B	B	
	Rear wheel weight	1 set	82,000,-	82,000,-	S.C	M	B	B	B	
	Bottom plow TB "Sugane"	1 set	430,000	430,000,-	S.C	M	B	C	B	
	Trailer DK-104	1 set	500,000,-	500,000,-	S.C	M	B	D-2	D-2	
	Power sprayer "Maruyama" SSP-H500	1 set	1,100,000,-	1,100,000,-	S.C	M	B	B	B	
	Soil hardness tester	2 sets	36,200,-	72,400,-	C	M	B	B	B	
	Portable PH meter	1 set	55,200,-	55,200,-	C	M	A	A	A	
	Balance max. 100 Kg min, 50 grams	2 sets	30,000,-	60,000,-	C	M	B	B	B	
	Thermograph	2 sets	38,000,-	76,000,-	C	M	A	C	D	
	Hygrograph	2 sets	50,000,-	100,000,-	C	M	A	C	D	
	Distance rain recorder	2 sets	100,000,-	200,000,-	C	M	B	B	D	
	Recording evaporation gange	2 sets	40,000,-	80,000,-	C	M	A	B	A	
	Robitzsch aktinograph	2 sets	110,000,-	220,000,-	C	M	A	B	A	
	Recording earth thermometer	2 sets	60,000,-	120,000,-	C	M	A	C	A	
	Screen box	2 sets	350,000,-	700,000,-	1-C,1-S.C	M	B	A	B	
	Elmo sound projector	1 set	300,000,-	600,000,-	C	All Sections	A	A	A	
	Elmo slide projector	1 set	130,000,-	130,000,-	C	P	C	C	-	DX
	Ricoh copier	1 set	214,000,-	214,000,-	C	-	A	-	D-2	DX
	Hermes portable typewriter	2 sets	75,000,-	150,200,-	C	T.S	A	A	D	Too old
	Color movie film on sericulture	3 rolls	600,000,-	1,800,000,-	C	T.S	C	D	B	
	Lion steel cabinet	6 sets	31,000,-	186,000,-	C	J. Experts	B	B	C	
	Olympus phase contract system microscope	1 set	314,000,-	314,000,-	C	P	A	A	A	
	Olympus system microscope Model BHB-213(SP)	1 set	340,000,-	340,000,-	C	P	A	A	A	
	Drying oven	1 set	280,000,-	280,000,-	S.C	E	A	A	B	
March 31, 1977	Komatsu dozer shovel D31S-16	1 unit	6,150,000,-	6,150,000,-	C	M	A	A	D-2	
B/L No. 514	Yanmer diesel tiller YZ8NXES105C	2 sets	410,000,-	820,000,-	1-SC,1-C	M	B	B	B	
	Trailer for Yanmer diesel tiller	2 sets	130,000,-	260,000,-	1-SC,1-C	-	-	-	-	DX
	Yanmer diesel generator YTB-2.0S	2 sets	250,000,-	500,000,-	C	T.S	B	B	B	
	Arimitsu Knapsack type power sprayer	5 sets	41,000,-	205,000,-	-	-	B	-	-	DX
April 2, 1977	Mulberry chopping machine	1 unit	73,000,-	73,000,-	C	E	A	A	C	
	Self registering thermometer	3 units	45,000,-	135,000,-	-	-	B	-	-	DX
Nov. 22, 1977	Male moth refrigerator :	-	-	-	-	-	-	-	-	
B/L No. 504	Prefabricated thermal insulation room	2 sets	1,450,000,-	2,900,000,-	S.C	E	A	A	C	
	Cooler unit	2 sets	600,000,-	1,200,000,-	S.C	E	A	A	B	
	Control panel	2 sets	67,000,-	134,000,-	S.C	E	A	A	B	
	Incubation room & egg refrigerate room	-	-	-	-	-	-	-	-	
	Prefabricated thermal insulation room	1 set	12,700,000,-	12,700,000,-	S.C	E	A	A	C	
	Refrigerating machine, type 6A-37HB	2 sets	580,000,-	1,160,000,-	S.C	E	A	A	B	
	Refrigerating machine type 6A-55HB	2 sets	730,000,-	1,460,000,-	S.C		A	A	B	
	Air conditioner, type RAS 212 US	3 sets	540,000,-	1,620,00,-	S.C	E	A	A	B	
	Cooling coil, type 41.5-L	4 sets	140,000,-	560,000,-	S.C	E	A	A	B	
	Cooling coil, type 41-L	4 sets	110,000,-	440,000,-	S.C	E	A	A	B	

1	2	3	4	5	6	7	8	9	10	11
	Drain pan for cooling coil	8 sets	72,000,-	576,000,-	S.C	E	A	A	B	
	Cooling tower, type HT-2.5Q	1 set	310,000,-	310,000,-	S.C	E	A	A	B	
	Cooling water pump, type 50 R4-51.5	1 set	84,000,-	84,000,-	S.C	E	A	A	B	
	Refrigerant control panel	1 set	220,000,-	220,000,-	S.C	E	A	A	B	
	Humidifier, type WN SSB-20	2 sets	350,000,-	700,000,-	S.C	E	A	A	B	
	Generator, type DCA-70SH-T	2 sets	4,300,000,-	8,600,000,-	S.C	E	A	A	B	
	Water softner, type TSF-1A	2 sets	112,000,-	224,000,-	S.C	E	A	A	B	
	Temperature & Humidiy controller	1 set	1,233,000,-	1,233,000,-	S.C	E	A	A	B	
	Electric control panel & accessaries	1 set	3,200,000,-	3,200,000,-	S.C	E	A	A	B	
	Oil storage tank	2 sets	480,000,-	960,000,-	S.C	E	A	A	B	
	Refrigerating piping	1 set	2,505,000,-	2,505,000,-	S.C	E	A	A	B	
	Cooling water piping & other piping	1 set	465,000,-	465,000,-	S.C	E	A	A	B	
	Piping & wiring materials	1 set	554,000,-	554,000,-	S.C	E	A	A	B	
March 15, 1978	Straw rope twisting machine, pedal working	2 sets	120,000,-	240,000,-	S.C	R	D	D	D-1	
	Straw mat weaving machine with parts	1 set	1,300,000,-	1,300,000,-	S.C	R	D	D	D-1	
	Mulberry leaves cutting machine, Rotary typy	2 sets	83,000,-	166,000,-	-	-	C	-	-	DX
	Wagon with spare pipe and leg	4 sets	73,000,-	292,000,-	-	-	B	-	-	DX
	Hyakumen mounting rack with holder	2,000 pcs.	1,700,-	3,400,000,-	C,SC	48-R,195-E	A	A	B	
	Rotary mounting rack	500 sets	3,000,-	1,500,000,-	46-C,75-P.U	46-R,75-P.U	A	A	C	379-DX
	Movie film	5 rolls	610,000,-	3,050,000,-	C	T.S	C	C	B	
	Mulberry harvesting machine, electric	2 sets	465,000,-	930,000,-	-	-	C	-	-	DX
	Rearing bed	1,700 pcs.	3,850,-	6,545,000,-	S.C	E	A	A	C	
	Rearing bed with accessaries	100 sets	113,000,-	11,300,000,-	C	R	A	A	B	
	Mulberry supply stand, folding type	45 pcs.	21,000,-	945,000,-	30-PU,10SC, 5-C	30-PU,15-E	A	A	B	
	Self registering measure for temperature & humidity	10 sets	45,000,-	450,000,-	C	E	A	A	B	
	Rear cart	3 sets	60,000,-	180,000,-	-	-	B	-	-	DX
	Floss removing machine, electric	4 sets	112,000,-	448,000,-	1-C,3-SC	1-R,3-E	A	A	B	
	Coccon harvesting machine, pedal working	1 set	57,000,-	57,000,-	C	E	B	B	A	
March 30, 1978 B/L No. 506	Self recording thermometer	3 sets	45,000,-	135,000,-	-	-	B	-	-	DX
March 31, 1978	Mametora tiller HMD-250 with trailer	2 units	340,000,-	680,000,-	C	M	B	B	B	
	Power tiller, model T620 with attachment	2 sets	310,000,-	620,000,-	S.C	M	B	-	-	DX
	Daihatsu truck, model S38T	1 unit	420,000,-	420,000,-	S.C	-	-	-	-	DX
	Knapsack type hand spayer, model K-15C	2 units	220,000,-	440,000,-	-	-	-	-	-	DX
	Hammer knife mower, Kyoei HMC-91	1 set	1,050,000,-	1,050,000,-	C	M	B	B	D-2	
	Komatsu angle dozer attachment D31S-16	1 set	410,000,-	410,000,-	S.C	M	A	A	B	
	Cutter, model S-18-2	2 sets	220,000,-	440,000,-	-	-	B	-	-	DX
	Silicon battery charger, Yuasa Z-3515A	2 sets	86,000,-	172,000,-	1-C	1-E	C	C	B	1-DX
	Refrigerator, Toshiba GR-230TT with transformer	1 set	150,000,-	150,000,-	C	T.S	B	B	B	
	Handy wagon, IUCHI 200 Kg 4-whell-type	1 pc.	64,000,-	64,000,-	S.C	M	B	B	B	
	Drying oven, KIYA NO.3846 A	1 set	135,000,-	135,000,-	C	M	B	B	B	
	Altimeter Pauline system	1 pc.	280,000,-	280,000,-	-	-	-	-	-	Lost
	Soil sedimentation apparatus , KIYA No. 327	2 sets	73,000,-	146,000,-	C	M	A	C	A	
	Soil volume weight testers, KIYA No. 329-B	2 sets	70,000,-	140,000,-	C	M	B	B	B	

1	2	3	4	5	6	7	8	9	10	11
	Soil actual volumenometer, KIYA NO. 331-B	1 set	470,000,-	470,000,-	C	M	A	B	A	
	Soil aggregation analysis apparatus, KIYA No.348	2 sets	320,000,-	640,000,-	C	M	A	B	A	
	Soil hardness tester KIYA No. 351	2 sets	50,000,-	100,000,-	C	M	A	A	A	
	Water permeability test apparatus, KIYA No. 354	2 sets	280,000,-	560,000,-	C	M	A	A	A	
	Sochlet's extraction apparatus, KIYA No. 412	1 set	150,000,-	150,000,-	C	M	A	A	A	
	Water still, KIYA No. 4111-B	1 set	120,000,-	120,000,-	C	M	B	B	B	
	Automatic table balance, KIYA No. 1019-A	2 sets	50,000,-	100,000,-	C	M	B	B	B	
	Kjeldahl distillation apparatus, KIYA No. 400	1 set	30,000,-	30,000,-	C	M	B	B	B	
	Photoelectric colorimeter, KIYA No, 7200	1 set	230,000,-	230,000,-	C	M	B	B	B	
	Demineralizer, KIYA No. 5010-A	1 set	110,000,-	110,000,-	C	M	A	A	A	
	Drying oven, KIYA No. 3846-A	1 set	150,000,-	150,000,-	C	M	A	B	B	
	Mill, wiley cutting MITAMURA No. 18-10	1 set	350,000,-	350,000,-	C	M	B	B	B	
	Flask & bottle shaker, KIYA No. 43320	1 set	190,000,-	190,000,-	C	M	A	A	A	
	PH-Colorimeter	1 set	42,000,-	42,000,-	C	M	B	B	B	
	Kjeldahl digester, KIYA No. 401	1 set	33,000,-	33,000,-	C	M	B	B	B	
	High pressure pump, Model HP-350	1 set	220,000,-	220,000,-	-	-	-	-	-	Lost
	Portable generator, Honda E1500T	2 sets	118,000,-	236,000,-	C	T.S	C	C	B	
	Electric fan F40EX	10 sets	20,000,-	200,000,-	9-C,1-SC	E	A	A	C	
	Microscope, Olympus CHA-213 with accessaries	5 sets	280,000,-	1,120,000,-	C	E	A	A	A	
	Stereo microscope, Olympus VA-2R	2 sets	61,000,-	122,000,-	-	-	B	-	-	DX
	Microscope, Olympus ST-3 with accessaries	2 set	27,000,-	54,000,-	S.C	E	A	A	A	
	8 m/m camera, Elmo 1,000 S	1 set	150,000,-	150,000,-	C	P	-	-	-	DX
	Camera, Canon AE-1	1 set	80,000,-	80,000,-	C	P	-	-	-	Lost
	8 m/m projector, Elmo ST-1200 HD	1 set	180,000,-	180,000,-	C	P	B	B	-	DX
	Taperecorder, Sony TC-150	1 set	45,000,-	45,000,-	-	-	C	-	-	Lost
	Copying machine, Ricoh PT-730	1 set	760,000,-	760,000,-	C	-	A	-	D-2	DX
	Diesel engine driven AT generator, Denyo DCA-55ST, 30 KVA	1 set	2,800,000,-	2,800,000,-	C	E	A	A	B	
	Diesel engine driven AC generator Denyo DCA-55ST, 40 KVA	1 set	3,150,000,-	3,150,000,-	C	E	A	A	B	
	Diesel engine driven AC, generator, Denyo DBA-10FYS, 10KVA	1 set	650,000,-	650,000,-	S.C	E	A	A	B	
	Tester YEW 3223	2 pcs.	38,000,-	76,000,-	C	T.S	B	B	B	
	Mitsubishi Jeep, Model H-J 38	1 set	2,000,000,-	2,000,000,-	C	All sections	A	A	D	Too old
	Motor cycle, Honda CT-125	3 sets	270,000,-	810,000,-	3-SC	T.S	A	A	D	Too old
March 31, 1978	Incubation room & egg refrigerator room	-	-	-	-	-	-	-	-	
B/L No. 511	Prefabricated thermal insulation room	1 set	11,000,000,-	11,000,000,-	C	E	A	A	D-2	
	Refrigerating machine	4 sets	540,000,-	2,160,000,-	C	E	A	A	B	
	Air conditioner	3 sets	240,000,-	720,000,-	C	E	A	A	B	
	Cooling coil, 41-2700-P10	2 sets	160,000,-	320,000,-	C	E	A	A	B	
	Cooling coil, 41.5-2700-P10	2 sets	180,000,-	360,000,-	C	E	A	A	B	
	Cooling coil, 41-3000-P10	1 set	160,000,-	160,000,-	C	E	A	A	B	
	Refrigerant control panel	1 set	170,000,-	170,000,-	C	E	A	A	B	
	Humidifier, WM SSB-20	2 sets	240,000,-	480,000,-	C	E	A	A	B	
	Cooling tower, HT-20SQ	1 set	230,000,-	230,000,-	C	E	A	A	B	
	Cooling water pump	1 set	90,000,-	90,000,-	C	E	A	A	B	
	Generator, DCA-70SH-T, 50 HZ, 60-70KVA	2 sets	4,200,000,-	8,400,000,-	C	E	A	A	B	
	Water softner	2 sets	110,000,-	220,000,-	C	E	A	A	B	
	Electric control equipment	1 set	3,100,000,-	3,100,000,-	C	E	A	A	B	
	Oil storage tank	2 sets	440,000,-	880,000,-	C	E	A	A	B	
	Refrigerating piping and refrigerant control equipment	1 set	2,000,000,-	2,000,000,-	C	E	A	A	B	

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	Electric wiring & piping conduct tube	1 set	500,000,-	500,000,-	C	E	A	A	B	
	Male moth refrigerator	-	-	-	-	-	-	-	-	
	Prefabricated thermal insulation room	1 set	1,100,000,-	1,100,000,-	C	E	A	A	D-2	
	Cooling unit, Electric wiring , HC15 TAB	1 set	600,000,-	600,000,-	C	E	A	A	B	
Jan. 24, 1979	High pressure pump, HP-350 with 4 cycle engine	3 pcs.	175,460,-	526,380,-	C	E	A	A	C	
B/L No. 503	Mulberry chopping machine, S2-2	3 pcs.	87,000,-	261,000,-	C	E	A	A	B	
	Mulberry chopping machine, Model KC-4	2 pcs.	489,800,-	979,600,-	C	E	A	A	B	
	Transferable rearing stand	50 pcs.	122,000,-	6,100,000,-	S.C	E	A	A	C	
	2 steps rearing stand	3 pcs.	168,000,-	504,000,-	S.C	E	A	A	A	
	Hygro- thermograph, 3-1120	5 pcs.	35,130,-	175,650,-	C	1-M,4-E	A	A	B	
	Cocoon weighing machine 20g (0,01g)	1 pc.	62,000,-	62,000,-	C	E	A	A	A	
	Floss removing machine	1 pc.	117,000,-	117,000,-	C	E	A	A	B	
	Cocoon harvesting machine	1 pc.	59,600,-	59,600,-	C	E	A	A	C	
	Pressure sterilizer, handle closing type	1 pc.	395,000,-	395,000,-	C	P	A	A	A	
	Microscope Dissection, Nikon SM-5	1 pc.	63,000,-	63,000,-	C	P	A	A	A	
	Incubator standard type, Inside dimensions 60X50X50 cm	1 pcs	165,000,-	165,000,-	C	P	A	A	A	
	Microscope slide coloset	1 pc.	85,600,-	85,600,-	C	P	A	A	A	
	Microscope stereoscopic, Nikon YB	1 pc.	252,000,-	252,000,-	C	P	A	A	A	
April 14, 1979 B/l No. 131-54933395	Hammer drill	1 set	81,240,-	81,240,-	C	T.S	C	C	C	
Feb. 23, 1980	Room cooler, window type RA-2255 C	5 units	235,000,-	1,175,000,-	C	All sections	B	A	B	
B/L No. 506	Maruyama high pressure pump, MS253ECR	2 units	240,000,-	480,000,-	C	M	A	B	A	
	Mowing machine, HMB-71	1 unit	540,000,-	540,000,-	C	M	B	B	B	
	Cutter, D-255	1 unit	420,000,-	420,000,-	C	M	A	C	B	
	Cycle trailer	10 units	58,000,-	580,000,-	C	M	B	B	C	
	Automatic rain gauge 7 days roll	7 units	95,000,-	665,000,-	4-C,3-SC	M	A	C	A	
	Maruyama high pressure pump, MS255ECR	2 units	230,000,-	460,000,-	1-SC,1-C	R	A	A	B	
	Movable silkworm rearing stand	3 units	130,000,-	390,000,-	S.C	E	A	A	B	
	2 steps rearing rack	6 units	92,500,-	555,000,-	S.C	E	A	A	B	
	Rotary mulberry cutting machine	3 units	80,000,-	240,000,-	S.C	R	D	D	D-1	
	Cocoon harvester, 110V, 50HZ, single phase	2 units	143,000,-	286,000,-	S.C	1-R,1-E	A	A	A	
	Cocoon harvester, HEIWA	2 units	53,000,-	106,000,-	C	1-R,1-E	A	A	B	
	Straw rope maker, treading type	1 unit	142,000,-	142,000,-	S.C	R	D	D	D-1	
	Straw mat maker, 110V, 50HZ	1 unit	963,000,-	963,000,-	S,C	R	D	D	D-1	
	Cocoon selector, 60X45X30 cm	2 units	38,000,-	76,000,-	C	R	A	A	A	
	Refrigerator freezer, 200 V, 50 HZ	1 unit	170,000,-	170,000,-	C	P	B	B	B	
	Incubator, standard type MIR-150	1 unit	315,000,-	315,000,-	C	R	B	B	B	
	Transformer 20A	5 units	38,000,-	190,000,-	C	T.S	D	D	D-1	
	Laboratory table	2 units	500,000,-	1,000,000,-	C	1-M,1-P	B	B	B	
	Side test table	3 units	169,000,-	507,000,-	C	1-M,2-P	B	B	B	
	High pressure washing machine, cabinet type	1 unit	250,000,-	250,000,-	C	R	A	A	B	
	Cocoon balance, 500g (0,5g)	2 units	54,000,-	108,000,-	C	R	A	A	A	
	Hygro-thermograph 7 days type	15 units	42,000,-	630,000,-	8-C,6-SC	R.E	A	A	B	1-DX
	Cocoon balance, 20g (0,01g)	1 unit	54,000,-	54,000,-	C	R	A	A	A	
	Hygro-thermograph, 7 days type	16 units	52,000,-	832,000,-	C	L-M,11-T.S.	C	C	B	4-DX
	Balance, 200g (50mg)	4 units	30,000,-	120,000,-	1-SC,3-C	1-R,3-M	A	A	A	
	Dispensing analytical balance, LU-T160D	1 unit	430,000,-	430,000,-	C	E	B	B	A	

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	Washing table for loose eggs	1 pc.	90,000,-	90,000,-	S.C	E	A	A	A	
	Dehydrator, 1/8 h.p, 110V, 50HZ	2 units	162,000,-	324,000,-	C	T.S	C	C	A	
	Phase contrast microscope, Olympus CHC-012	15 units	102,000,-	1,530,000,-	C	1-P,14-E	A	A	A	
	Microscope for dissection, Olympus VMZ-4S (SP)	1 unit	120,000,-	120,000,-	C	P	A	A	A	
	Dry machine, 110V, 50 HZ	1 unit	790,000,-	790,000,-	C	E	A	A	A	
	Storage cabinet, KC-102-15	2 units	160,000,-	320,000,-	C	E	A	A	A	
	Drying shelf, DS-L	1 unit	56,000,-	56,000,-	C	P	A	A	A	
	Desk centrifugal seperator, 90H-22	1 unit	187,000,-	187,000,-	C	P	A	A	A	
	Drying sterilizer, AHS-6	1 unit	350,000,-	350,000,-	C	P	A	A	A	
	Dispensing analytical balance, Jupiter PT3-160D	1 unit	430,000,-	430,000,-	C	P	A	A	A	
	Mixing machine for test tube, D-10	1 unit	36,000,-	36,000,-	C	P	A	A	A	
	Sink units, TS-0-9	1 unit	130,000,-	130,000,-	C	P	A	A	A	
	Elector shelf	2 sets	63,000,-	126,000,-	C	T.S	B	B	C	
	Steel filing 4 steps	2 units	39,000,-	78,000,-	C	T.S	B	B	C	
	Microscope, Research, Trinocular, Olympus BE-TR45	1 unit	42,000,-	42,000,-	C	P	B	B	B	
	Screen, Fix type	1 unit	70,000,-	70,000,-	C	T.S	C	C	C	
	Locker, 1to SV-12A	1 unit	52,200,-	52,200,-	C	T.S	B	B	C	
	Bookshelf, Lion WK-87D	2 units	68,400,-	136,800,-	C	T.S	B	B	C	
	Steel filing cabinet 34,4 steps	4 units	40,000,-	160,000,-	C	T.S	B	B	C	
	Typewriter, Olivetti MS-32	1 unit	37,000,-	37,000,-	C	T.S	A	A	B	
	Sunshade for Doser-Shovels Driving seat, KOMATSU	1 unit	90,000,-	90,000,-	C	M	B	B	B	
	Rotary for mame-tora trailor EMD	2 units	70,000,-	140,000,-	1-C,1-SC	M	B	B	B	
March 26, 1980	Trencher for Kubota tractor L-2201	1 pc.	500,000,-	500,000,-	S.C	M	B	C	B	
B/L No.509	Tractor, Kubota L-2201	1 unit	1,865,400,-	1,865,400,-	S.C	M	B	B	B	
	Honda motorcycle, XL-100	3 sets	320,0000,-	960,000,-	C	T.S	A	A	B	
	Purified water plant equipment	-	-	-	-	-	-	-	-	
	Automatic sand filter equipment, AV-9	1 set	4,766,000,-	4,766,000,-	C	All sections	A	A	B	
	Automatic sand filter tank	1 set	900,600,-	900,600,-	C	All sections	A	A	B	
	Chlorine into equipment	1 set	536,000,-	536,000,-	C	All sections	A	A	B	
	Distribution panel	1 set	2,394,000,-	2,394,000,-	C	All sections	A	A	B	
	Automatic water supply equipment	1 set	3,352,000,-	3,352,000,-	C	All sections	A	A	B	
April 16, 1980	Nissan caravan, Model GKRE20SU	1 unit	1,638,000,-	1,638,000,-	C	All sections	A	A	C	
B/L No.519	Nissan caball, Model QC340U	1 unit	1,419,000,-	1,419,000,-	S.C	All Sections	A	A	C	
	Datsun pick-up S720 TU	1 unit	1,012,000,-	1,012,000,-	S.C	All sections	A	A	C	
	Datsun 280 station wagon, Model WP430 VU	1 unit	1,342,000,-	1,342,000,-	C	J. Experts	A	A	C	
April 16, 1980	Cocoon cutter, HS-OS	1 unit	1,700,000,-	1,700,000,-	S.C	E	A	A	B	
B/L No. 527	Self temp. & humid. meter	10 units	60,000,-	600,000,-	C	E	A	A	B	
	Microscope, Olympus SZTR	5 units	148,000,-	740,000,-	2-C,3-SC	E	A	A	A	
	Phase contrast microscope, Olympus	10 units	110,000,-	1,100,000,-	C	E	A	A	A	
	Moth regulator	1 unit	3,509,700,-	3,509,700,-	C	E	A	A	A	
	Incubator, Riccar MIR-150	2 units	555,000,-	1,110,000,-	C	1-P,1-E	A	A	A	
	Autoclave, EA-24	1 unit	380,000,-	380,000,-	C	P	A	-	-	
	Motor power sprayer, MS253ECR	5 units	150,000,-	750,000,-	4-C,1-SC	1-P,1-R,3-TS	A	A	B	
	Microscope, Fluorescence, Nikon YF-EF	1 unit	1,300,000,-	1,300,000,-	C	P	A	A	A	
	Microscope, Nikon YS-11	10 units	280,000,-	2,800,000,-	C	E	A	B	A	
	Motor power sprayer, MS253ECR	5 units	142,000,-	710,000,-	4-PU,1-C	4-PU,1-M	A	A	B	
	Beam balance, 10 Kg (5g)	5 units	40,000,-	200,000,-	C	M	C	C	B	
	Hygro-thermograph, 3-1120	5 units	37,000,-	185,000,-	C	E	A	A	A	

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April 18, 1980	Rearing stand, transferable	22 units	156,000,-	3,432,000,-	14-C,8-PU	14-R,8-PU	A	A	B	
B/L No. 504	Incubator stand	1 unit	130,000,-	130,000,-	C	E	A	A	A	
	Mulberry chopping machine handy tupe	5 units	105,000,-	525,000,-	P.U	P.U	A	A	B	
	Mulberry chopping machine, handy type	5 units	105,000,-	525,000,-	S.C	1-R,4-E	A	A	B	
	Transferable rearing stand	20 units	156,000,-	3,120,000,-	3-SC,17-PU	3-E,17-PU	A	A	B	
	Mulberry bring up stand SY-1	2 units	80,000,-	160,000,-	C	E	A	A	A	
	Mulberry bring up stand SY-2	4 units	120,000,-	480,000,-	S.C	E	A	A	A	
	Rotary cocooning frame, cocoon harvesting	2 units	60,000,-	120,000,-	C	E	B	C	A	
	Mulberry carrier	5 units	60,000,-	300,000,-	4-SC,1-C	4-R,1-M	B	B	B	
Nov. 17, 1980	Kubota tractor L-2201	1 pc.	1,200,000,-	1,200,000,-	C	M	B	A	B	
B/L No. 516	Strake for above	1 pc.	75,840,-	75,840,-	C	M	B	B	B	
	Rotary for above	1 pc.	123,720,-	123,720,-	C	M	B	B	B	
	Trencher for above	1 pc.	500,000,-	500,000,-	C	M	-	-	-	DX
	Hammer knife mower, HMB-71	1 unit	494,000,-	494,000,-	C	M	B	B	C	
	Lux meter	1 set	54,000,-	54,000,-	C	M	B	B	B	
	Direct reading balance, PTS-1600	1 unit	392,200,-	392,200,-	C	M	A	B	A	
	Micro syringe propelling apparatus	1 pc.	45,000,-	45,000,-	C	P	A	A	A	
	Semi-auto counter balance	2 units	53,000,-	106,000,-	C	1-M,1-P	C	B	B	
	Drying oven	1 unit	55,000,-	55,000,-	C	P	A	A	A	
	Refrigerated centrifuge	1 set	814,000,-	814,000,-	C	P	A	A	A	
	Shaking washer	1 unit	60,000,-	60,000,-	C	P	A	A	A	
	Paraffin strip manufacture instrument set	-	-	-	-	-	-	-	-	
	Microtome	1 unit	239,000,-	239,000,-	C	P	A	A	A	
	Paraffin melting apparatus	1 pc.	221,800,-	221,800,-	C	P	A	A	A	
	Paraffin spreading apparatus	1 unit	52,000,-	52,000,-	C	P	A	A	A	
	Inciner, Model SK-150	1 pc.	150,000,-	150,000,-	C	P	A	A	A	
	Insect rearing box	5 pcs.	78,400,-	392,000,-	C	P	A	A	A	
	Insect collecting apparatus	1 unit	187,000,-	187,000,-	C	P	A	A	A	
	Sony VTR-VO 2630	1 set	525,000,-	525,000,-	C	P	C	C	A	
	Sony TV CVM-1850E	1 set	220,000,-	220,000,-	C	P	C	C	A	
	Elmo overhead projector, HP-2450	1 set	100,000,-	100,000,-	C	All sections	B	B	A	
	Sakura foil printer, B4C	1 set	44,000,-	44,000,-	C	P	B	B	A	
	Copy machine, DT-1500	1 set	647,000,-	647,000,-	C	All sections	A	A	D-2	
	Stereopic zoom microscope, Olympus SZ-1	1 unit	123,000,-	123,000,-	C	P	C	B	B	
Dec. 21, 1980	Datsun patrol, K160- UC	3 units	1,510,000,-	4,530,000,-	C	1-Jap. Expert 2-All sections	A	A	B	
B/L No. 501	Datsun caball, GHC 340 WU	1 unit	2,287,000,-	2,287,000,-	C	All sections	A	A	B	
	Datsun homer, MF 20 U	2 units	1,120,000,-	2,240,000,-	1-C,1-SC	All sections	A	A	B	
	Datsun pick-up, G 720 U	2 units	990,000,-	1,980,000,-	C	All sections	A	A	B	
Jan 27,1981	Root-up machine	2 sets	53,500,-	107,000,-	C	M	C	C	B	
B/L No. 506	Rotary type mulberry chopping machine	3 sets	106,000,-	318,000,-	S.C	E	A	B	A	
	High spreed washing machine, KE 13	3 sets	370,000,-	1,110,000,-	C	2-E,1-R	A	A	B	
	Cocoon dryer	1 set	1,110,000,-	1,110,000,-	C	E	A	B	B	
	Engine generator, DCA-35ST	1 set	1,428,700,-	1,428,700,-	S.C	All sections	D	D	D-1	
	Distributor (Scottrans)	1 pc.	760,000,-	760,000,-	S.C	All sections	D	D	D-1	
	Distributor for DBA-10FYS	1 pc.	150,000,-	150,000,-	S.C	All sections	D	D	D-1	
	Distributor for DCA-55S	1 pc.	450,000,-	450,000,-	C	C.T	A	A	B	
	Inspection machine of pebrine disease for massiree moths SPM-2 with accessaries	3 sets	6,960,000,-	20,880,000,-	2-C,1-SC	E	A	A	B	

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March 31, 1981 B/L No. 503	Borer, SA-2 type	1 set	82,140,-	82,140,-	C	T.S	C	D	D-1	
April 22, 1981 B/L No. 505	Inspection machine of pebrine disease for massiree moths SPM-2 with accessaries	1 set	6,960,000,-	6,960,000,-	S.C	E	A	A	B	
Local purchase dilevered on March 7, 1981	Water tank with accessaries	1 set	718,080,-	718,080,-	S.C	All sections	A	A	B	
	Deep well pump (Grundfos SP-10)	1 set	897,600,-	897,600,-	S.C	All sections	A	A	B	
Local purchase delivered on March 11, 1982	Kerosen/electric operated refrigerator with transformer	2 sets	298,959,-	597,918,-	C	E	B	A	B	
Local purchase delivered on March 15, 1982	Cocoon selection table	1 unit	25,003,-	25,003,-	C	C.T	A	A	B	
	Cocoon storing shelves	2 units	104,183,-	208,366,-	C	C.T	A	A	B	
	Weighing scale table	1 unit	25,003,-	25,003,-	C	C.T	A	A	B	
	Control desk	1 unit	35,422,-	35,422,-	C	C.T	A	A	B	
	Cabinet	2 units	75,012,-	150,024,-	C	C.T	A	A	B	
	Kitchen washing unit	1 unit	31,255,-	31,255,-	C	C.T	A	A	B	
March 30, 1982 B/L No. 505	Cocoon testing equipments	-	-	-	-	-	-	-	-	
	Boiler main body	1 set	4,000,000,-	4,000,000,-	C	C.T	A	B	A	
	Cocoon dryer	1 set	4,200,000,-	4,200,000,-	C	C.T	A	B	A	
	Cocoon selecting machine	1 set	350,000,-	350,000,-	C	C.T	A	B	A	
	Cocoon boiling machine, HSS-1	1 set	2,000,000,-	2,000,000,-	C	C.T	A	B	A	
	Keinan multi-end silk reeling machine, 20 end	1 set	3,800,000,-	3,800,000,-	C	C.T	A	B	A	
	Re-reeling machine	1 set	800,000,-	800,000,-	C	C.T	A	B	A	
	Booking machine	1 set	300,000,-	300,000,-	C	C.T	A	B	A	
	Water contents of rawsilk inspecting dryer	1 set	2,000,000,-	2,000,000,-	C	C.T	A	B	A	
	Electronic top-loading sartorius, 1200MP	1 unit	400,000,-	400,000,-	C	C.T	A	B	A	
	Seriplane winder, 0,2 KW	1 set	2,132,200,-	2,132,200,-	C	C.T	A	B	A	
	Seriplane illumination apparatus	1 set	3,650,000,-	3,650,000,-	C	C.T	A	B	A	
	Steam heater	1 pc.	290,000,-	290,000,-	C	C.T	A	B	A	
	Skein twisting apparatus	1 set	60,000,-	60,000,-	C	C.T	A	B	A	
	Water softner	1 set	1,756,000,-	1,756,000,-	C	C.T	A	B	A	
	Measuring meter (hand turning system)	2 pcs.	75,000,-	150,000,-	C	C.T	A	B	A	
	Denier balance	4 pcs.	75,000,-	300,000,-	C	C.T	A	B	A	
	Laboratory table, Takeda	1 unit	278,000,-	278,000,-	C	C.T	A	B	A	
	Brush cutter, KIORITS SRM-402 DE	3 sets	40,000,-	120,000,-	2-C,1-SC	M	A	B	A	
	Chainsaw, KIORITS CS-100/VL	2 sets	80,000,-	160,000,-	1-C	1-M	C	C	A	
	Zero cross thermo, TH-1500	3 pcs.	40,000,-	120,000,-	C	P	B	B	A	
	Copy stand, Nikon PL-3	1 set	240,000,-	240,000,-	C	P	B	B	A	
	Trinocular micrometer, Nikon XF-21	1 set	1,120,000,-	1,120,000,-	C	P	A	A	A	
	Photo enlarger, Nikon SS-690	1 set	150,000,-	150,000,-	C	P	A	A	A	
	Floss remover	10 sets	32,000,-	320,000,-	1-C,9-SC	R	A	A	C	
	Electric typewriter with transformer, Olivetti ET-121	2 units	390,000,-	780,000,-	C	T.S	A	A	A	
	Manual typewriter, Olivetti MS-98 18 inch	3 units	140,000,-	420,000,-	C	T.S	A	A	A	
June 19, 1982 B/L No. UP-1003	Toyota land cruiser station wagon, EJ60RV-KC	1 unit	2,150,000,-	2,150,000,-	C	Japanese Experts	A	A	A	

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Local purchase delivered on October 21,1982	Toyota Dyna Bus/BU30R-QRDHT3	1 unit	3,998,857,-	3,998,857,-	C	All sections	A	A	A	
	Toyota Hi-Ace Truck/LH11R-JRY	2 units	2,171,810,-	4,343,620,-	C	All sections	A	A	A	
Local purchase delivered on October 22,1982	Yamaha motorbike RX-S 115cc	3 units	345,778,-	1,037,344,-	P.U (Soppeng, Sidrap, Enrekang)	P.U.	A	A	A	
Local purchase delivered on October 29,1982	Mitsubishi Pick-up L-300	1 unit	1,439,897,-	1,439,897,-	C	All sections	A	A	A	
October 18,1982 B/L No. UP-1003	Cocoon floss remover (hand type)	15 sets	35,000,-	525,000,-	C	R	A	A	A	
	Leaf chopper (rotary type)	5 sets	192,600,-	963,000,-	C	R	A	A	A	
	Automatic platform scale for 50 Kgs.	2 sets	56,650,-	113,300,-	C	R	A	A	A	
	Yamada's skein winder Model TYS-8SV	1 set	2,366,000,-	2,366,000,-	C	CT	B	A	A	
	Seri Graph	1 set	2,243,000,-	2,243,000,-	C	CT	B	A	A	
	Water treatment equipment	1 set	1,963,000,-	1,963,000,-	C	CT	B	A	A	
	Mono cocoon reeling machine	1 set	617,400,-	617,400,-	C	CT	B	A	A	
	Engine driven DC Arc welder ACD-170-E (ASI)	1 set	540,750,-	540,750,-	C	All sections	B	A	A	
	Air compressor Model CH-1	1 set	229,690,-	229,690,-	C	All sections	B	A	A	
	Hydraulic garage jack Model. M-1000M	1 set	157,590,-	157,590,-	C	All sections	B	A	A	
	Tire service tool set Model AW-3200TB&T-4	1 set	153,780,-	153,780,-	C	All sections	B	A	A	
	Socket wrench set Model HD-260M	1 set	44,290,-	44,290,-	C	All sections	B	A	A	
	Oil gun Model STB-60	1 set	70,250,-	70,250,-	C	All sections	B	A	A	
	High pressure car washer Model CW-122ACH	1 set	998,070,-	998,070,-	C	All sections	B	A	A	
	Maruyama power sprayer Model CBM-301	2 sets	531,000,-	1,062,000,-	C	E	A	A	A	
	Maruyama power sprayer Model MS-253	5 sets	64,270,-	321,350,-	C	M	B	B	A	
	KYOUEISHA Hummer knife mower Model HMD-91	2 sets	695,250,-	1,390,500,-	1-C,1-SC	E	B	B	A	
	KAWABE Trencher Model TTS-43A	1 set	640,000,-	640,000,-	C	M	B	B	A	
	KUBOTA Tractor	1 set	1,886,370,-	1,886,370,-	C	E	B	A	A	
	DELICA Trailer Model DK-7A	2 sets	244,110,-	488,220,-	C	E	B	A	A	
	NIPLO Rotary Mower Model NFZ-1501	3 sets	391,000,-	1,173,000,-	2-C,1-SC	1-M,2-E	B	B	A	
Nov. 16, 1982	Toyota Land Cruiser Station Wagon, EJ60RV-KC	1 unit	2,201,600,-	2,201,600,-	U.P. Port	Not yet used	A			

4. プロジェクトからジャカルタ事務所へ提出された乾繭施設建設の要請書

DEPARTEMEN PERTANIAN
DIREKTORAT JENDERAL KEHUTANAN
PROYEK PEMBINAAN PERSUTERAAN ALAM SULAWESI SELATAN
BILI - BILI, KEC. BONTOMARANNU KAB. GOWA
(P.O. BOX 184 UJUNG PANDANG)

No. 924/1PA/VII/1983. July 1, 1983.

Mr. Hiroshi Yamamura
Resident Representative
Japan International Cooperation Agency.
24, Jalan Thamrin,
Jakarta.

Subject: Request for the construction of an experimental cocoon drying and storage facility (house) at Kab. Soppeng, South Sulawesi.

Dear sir,

First of all, I would like to express my utmost gratitude for the support provided by Japan International Cooperation Agency in sericultural techniques through Japanese experts and in equipments & materials during the past seven years since 1976.

Thanks to the cooperation of your agency, our project has solved most of the technical problems we faced in the past in South Sulawesi, and now the sericultural industry in this province is growing steadily.

However, in spite of our expanding activities, we are still facing one big problem i.e. the development and improvement of cocoon drying and storage techniques and facilities.
Though sericultural farmers in South Sulawesi can now produce bigger amount of better quality cocoons with the techniques developed and/or improved by our project, they are facing some difficulties in the preparation of cocoons for reeling. As you are of course aware, good quality raw silk can be produced only when better quality cocoons are reeled carefully.

In view of such recognition, we came to the conclusion that some positive countermeasures are needed to be taken to improve the techniques and facilities of cocoon drying and storage systems.
As an experimental stage, we hope to build one unit of simple experimental cocoon drying and storage facility in Kab. Soppeng.

DEPARTEMEN PERTANIAN
DIREKTORAT JENDERAL KEHUTANAN
PROYEK PEMBINAAN PERSUTERAAN ALAM SULAWESI SELATAN
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(P.O. BOX 184 UJUNG PANDANG)

However, we are at present still having problem in budget that can finance the construction of one unit of an experimental cocoon drying and storage facility.
As you are well aware, our budget situation is quite difficult at present, as a result we are having very hard time to look for the budget for this facility.

Under such situations, I would like to know if it is possible for your agency to finance the construction of above explained facility.
It is very much appreciated if your agency could help us in the construction of this simple experimental cocoon drying and storage facility (house) in this fiscal year.

It is very sure that this planned facility can help us conduct necessary experiments for the development and/or improvement of the techniques & facilities of cocoon drying & storage system, and ultimately help propagate our sericultural techniques developed and/or improved by Sericultural Development Project (ATA-72) among sericultural farmers even more smoothly.

Expecting for your earlier reply.

Sincerely,

Yohanes Richard B.Sc.
Project Manager,
Sericultural Development Project.

C.C. : - Dr. Nobuyuki Mori
Japanese Team Leader.
- Ir. Sutisna Wartasaputra
Director of Planting and Arable Control
- F i l e.

SUPPLEMENTARY NOTE ON THE RECORD OF DISCUSSIONS BETWEEN THE JAPANESE CONSULTATION TEAM AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF INDONESIA ON THE TECHNICAL COOPERATION FOR THE SERICULTURAL DEVELOPMENT PROJECT IN INDONESIA

The Japanese Consultation Team (hererinafter referred to as "the team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Toshihiro Shimada and the Indonesian authorities concerned exchanged views on the special measures to supplement a portion of the local cost expenditures of the Sericultural Development Project in Indonesia (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed to recommend to their respective Governments the following for the successful implementation of the Project.

For fostering the smooth promotion of the Project the government of Japan, in accordance with the laws and regulations in force in Japan, will take necessary measures through JICA to supplement, when necessity arises, a portion of the local cost expenditures for the improvement works of the physical infrastructure of the Project, such as construction works of cocoon drying facilities and so on.

Jakarta, December 10, 1983

T. Shimada

Mr. Toshihiro Shimada
Leader, The Japanese Consultation Team Japan International Cooperation Agency

Ir. Wartoho Kadri
Director General
of Reforestation and Land Rehabilitation,
Department of Forestry.

Proposal for Model Infrastructure Works No. 1

- Cocoon drying facilities -

1. Aim:

(1) By killing pupae with high temperature, give farmers longer time to reel raw silk slowly without the fear of moth emergence from cocoons, thus improving the quality of raw silk produced by farmers.

(2) By heating cocoons with high temperature in a separate place, kill pathogens of silkworms and avoid the contamination of rearing place and tools with silkworm pathogens.

2. Proposed works to be done (per unit):

(1) Cocoon drying and treatment building - One unit each
- Please see the attached sketch and explanation for detail.

(2) Cocoon drying apparatus - One unit each
- Please see the attached sketch and explanation for detail.

(3) Cocoon sorting stand - One unit each
- Please see the attached sketch and explanation for detail.

(4) Working table - Two units each
- Please see the attached sketch and explanation for detail.

(5) Water tank with foundation - One unit each
- Please see the attached sketch and explanation for detail.

(6) Washing table - One unit each
- Please see the attached sketch and explanation for detail.

(7) Shallow well - One unit each

a. Dug by manpower
b. Depth -- up to 10 m (depending on site)
c. Reinforced by bricks & concrete or similar materials
d. Hand pump with pipe fitting
e. Piping to water tank

3. Proposed construction site

(1) Pising Pilot Unit

Place: Pising, Desa Solie, Kab. Soppeng
- At the house compound of Mr. Tahir.

For : Pilot Unit Members - 25 farmers
- Chief: Mr. Tahir.

Remarks:

(a) There is a community water supply system.
- No need of shallow well.

(b) Farmer reeling is carried out throughout members.

(c) Cooperation among member is good.

(d) Maximum capacity of young silkworm rearing unit (30 boxes) is used continuously.

(2) Ugi Pilot Unit

Place: Bila Ugi, Kab. Wajo
- At the house compound of Mr. Usman P.

For : Pilot Unit Members - 20 farmers.
- Chief: Mr. Usman P.

Remarks:

(a) Farmer reeling is carried out throughout members.

(b) Cooperation among members is good.

(c) Maximum capacity of young silkworm rearing unit (30 boxes) is used continuously.

(3) Substitute nomination - Madelo Demonstration Unit

Place: Kampung Binuang, Desa Madelo, Kab. Barru
- Detailed site not nominated yet.

For : Sericultural farmers in Desa Madelo - about 40 farmers. - Not organized yet.

Remarks:

(a) Most of sericultural farmers started rearing activities newly.

(b) Farmer reeling is carried out throughout farmers.

(c) There is a big vacant land area, thus big possibility in expanding sericultural activities.

(d) Water is easily obtained with shallow well.

4. Attached reference materials:

(1) Rough Sketch of the works (constructions) planned

(2) Explanation for Cocoon drying facilities.

(3) Map of the project activities in South Sulawesi.

EXPLANATIONS FOR COCOON DRYING FACILITIES

1. List of articles and quantity

(1)	Building	1 unit
(2)	Cocoon drying apparatus	1 unit
(3)	Cocoon sorting stand	1 unit
(4)	Working table	2 units
(5)	Water tank with foundation	1 unit
(6)	Washing table	1 unit

2. Specifications of each article

(1) Building - See plan for design

a. One story house
b. Width 6 m x Length 11 m
c. Roofing - Wave galvanized iron sheet (13 m x 4.5 m) x 2
d. Floor - Concrete

Thickness	10 cm
Floor area	66 m2

e. Terrace - Concrete

Thickness	10 cm
Terrace area	46 m2

f. Drainage canal

Length	49 m

g. Front

(a) Entrance - double leaf door
(b) Wall - brick and mortar 4m x 2.5m (Window 1.2 m2)
(c) Window - 1 m x 1.2 m, with glass (Jendela)
(d) Signboard - 1.8 m x 0.5 m
(e) Gable - Wooden board with ventilation opening

h. Back

(a) Wall - brick and mortar 1 m x 6 m = 6 m2
(b) Wire netting for anti-theft purpose - 1.5 m x 6 m = 9 m2
(c) Gable - Wooden board with ventilation opening

i. Side (both sides are same)

(a) Wall (B) - brick and mortar 1 m x 8 m = 8 m2
(b) Wall (F) - brick and mortar 2.5 m x 3 m (window 2 m2)
(c) Window - 1 m x 2 m, with glass (jendela)
(d) Wire netting for anti-theft purpose - 1.5 m x 8 m = 12 m
(e) Rainwater piping - 13 m.

j. Sizes of timbers (wood) for pillars or supports should be based on the standard of building construction. Number of pillars and/or supports used should also be calculated based on the standard of building construction.

(2) Cocoon drying apparatus - See plan for design

(a) Size Width 110 cm x Length 110 cm x Height 149 cm

(b) Made of iron plate and "L" shaped (angled) iron.

(c) Door - double leaf door

(d) Inside

a). 9 steps; install "L" shape (angled) iron on both sides.

b). Air control damper with ventilation holes.

(e) Heating part - Double - bottom with iron plate and chinese cooking pan.

(f) Bottom (floor) - Iron plate with a hole for kerosene burner

(g) Cocoon drying tray

(a). Size (outer) 98.4 cm x 99.5 cm x 6 cm

(b). Made of wood - 1 cm thick wood

(c). Bottom - Wire netting (0.5 cm x 0.5 cm mesh)

(h) With kerosene burner and pressure tank with pump.

(3) Cocoon sorting stand - See plan for design

(a) Made of wood with bamboo drainboard

(b) Size 120 cm x 180 cm x height 90 cm

(4) Working table - See plan for design

(a) Made of wood

(b) Size 64 cm x 72 cm x height 80 cm

(c) Thickness of surface board - 2 cm

(5) Water tank - See plan for design

(a) Material

a. Outside - Wood
b. Inside - Galvanized iron sheet

(b) Inside measurement 80 cm x 150 cm x height 40 cm
(c) Thickness of wooden board - 3 cm (for bottom - 4 cm)

(d) Foundation

a. Brick and mortar
b. Height - 26 cm

(6) Washing table - See plan for design

* Can be ready made one.

Proposal for Model Infrastructure Works No. 2

- Water Supply System for Pilot Units -

1. Aim:

By supplying clean water to the water reservoir of each Pilot Unit anytime when it is needed, make the cleaning and disinfection of rearing rooms, tools and personnel easier, thus enabling the outcome of demonstration even more distinguishing.

2. Proposed works to be done (Per Unit):

(1) Construction of well - One unit each

a. Dug by manpower

b. Depth - up to 10 m (depending on site)

c. Reinforced by bricks and concrete or similar materials.

(2) Pump - One unit each

a. Hand pump with pipe fitting

b. Well is closed after pump installation.

(3) Piping - One unit each

a. Iron piping between hand pump and reservoir of Pilot Unit.

b. Length varies from site to site.

(4) Washing and bathing place for public - One unit each

a. Concrete floor and simple water reservoir

b. Should be apart from young silkworm rearing unit

- If well was constructed near unit, washing and bathing place for public be constructed at least 10 m apart from unit with proper length of iron pipe.

- If well was constructed apart from unit, washing and bathing place for public be constructed near well.

3. Proposed construction site.

(1) Baraka Pilot Unit

Place : Baraka, Desa Baraka, Kab. Enrekang

Member: 20 farmers

Chief : Mr. Abd. Karmas

Capacity of young silkworm rearing unit: 30 boxes

Owner of land:

Unit : Sericultural Dev. Project

Proposed well site : Sericultural Dev. Project

Remarks:

(a) Water level (river level) is about 10 m below young silkworm rearing.

(b) Land between young silkworm rearing unit and river is steep slope.
- difficult to find the well site.

(c) Water must be pumped up about 10 m, if well is dug beside the river.

(2) Ugi Pilot Unit

Place : Bila Ugi, Kab. Wajo

Member: 20 farmers

Chief : Mr. Usman P.

Capacity of young silkworm rearing unit: 30 boxes

Owner of land:

Unit : Mr. Usman P. (Chief)

Proposed well site : Mr. Usman P. (Chief)

Remarks:

(a) Water level is estimated to be about 9 m below ground level during dry season.
- Near Bila river.

(3) Pising Pilot Unit

Place : Pising, Desa Solie, Kab. Soppeng

Member: 25 farmers

Chief : Mr. M. Tahir Mude

Capacity of young silkworm rearing unit: 30 boxes

Owner of land:

Unit : Mr. Tahir (Chief)

Proposed well site : Mr. Tahir (Chief)

Remarks:

(a) There is a spring on the proposed well site used by about 50 families as washing and bathing place.

(4) Luppange Pilot Unit

Place : Luppange, Desa Lalabata Riaja, Kab. Soppeng

Member : 21 farmers

Chief : Mr. Usman Koro

Capacity of young silkworm rearing unit: 30 boxes

Owner of land:

Unit : Sericultural Dev. Project

Well I : Mr. Laoppu

Well II : Mr. Dalle

Remarks:

(a) Both wells are owned by third persons.

(b) Luppange Pilot Unit is planned to be taken by the Project soon as training facility, and operated by the Project.

(5) Wanio Pilot Unit

Place : Wanio, Kab. Sidrap

Member : 30 farmers

Chief : Mr. Abd. Latif

Capacity of young silkworm rearing unit: 30 boxes

Owner of land:

Unit : Mr. Abd. Latif (Chief)

Proposed well site: Mr. Abd. Latif (Chief)

Remarks:

(a) Proposed well site is beside river.

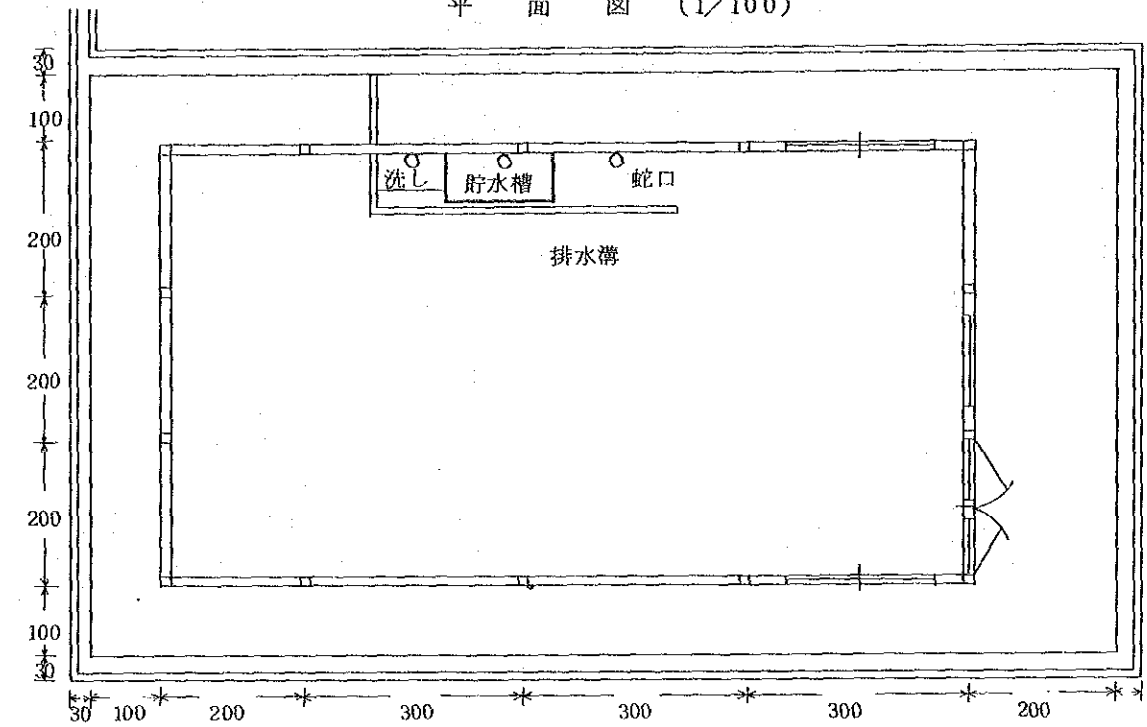
(b) The river is almost dried up during dry season (but not completely dried up).

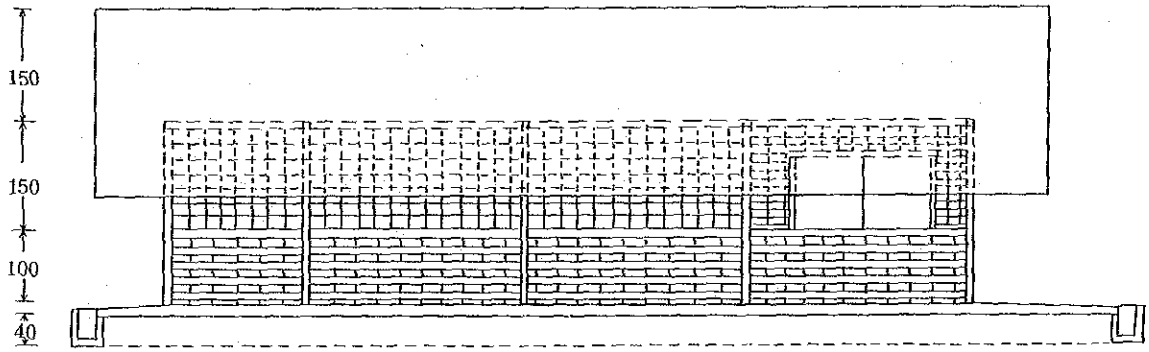
4. Rough sketch of the sites:

Please see attached sketches.

図－2

平　面　図　(1/100)





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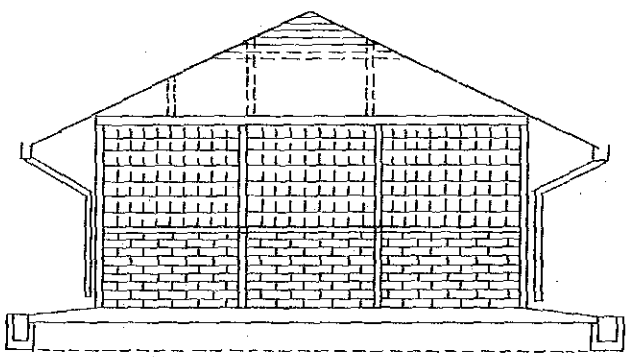

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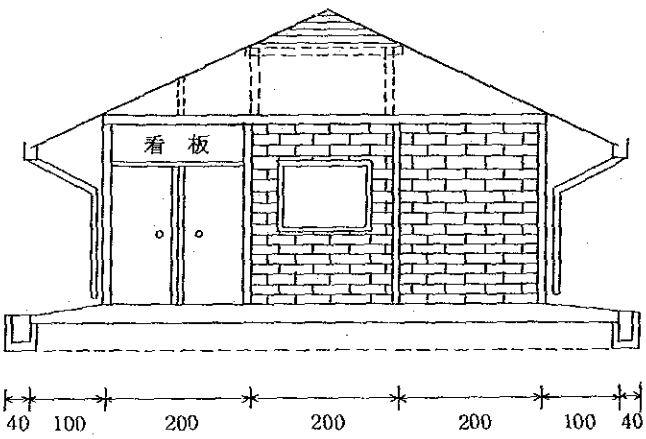

正　面　図

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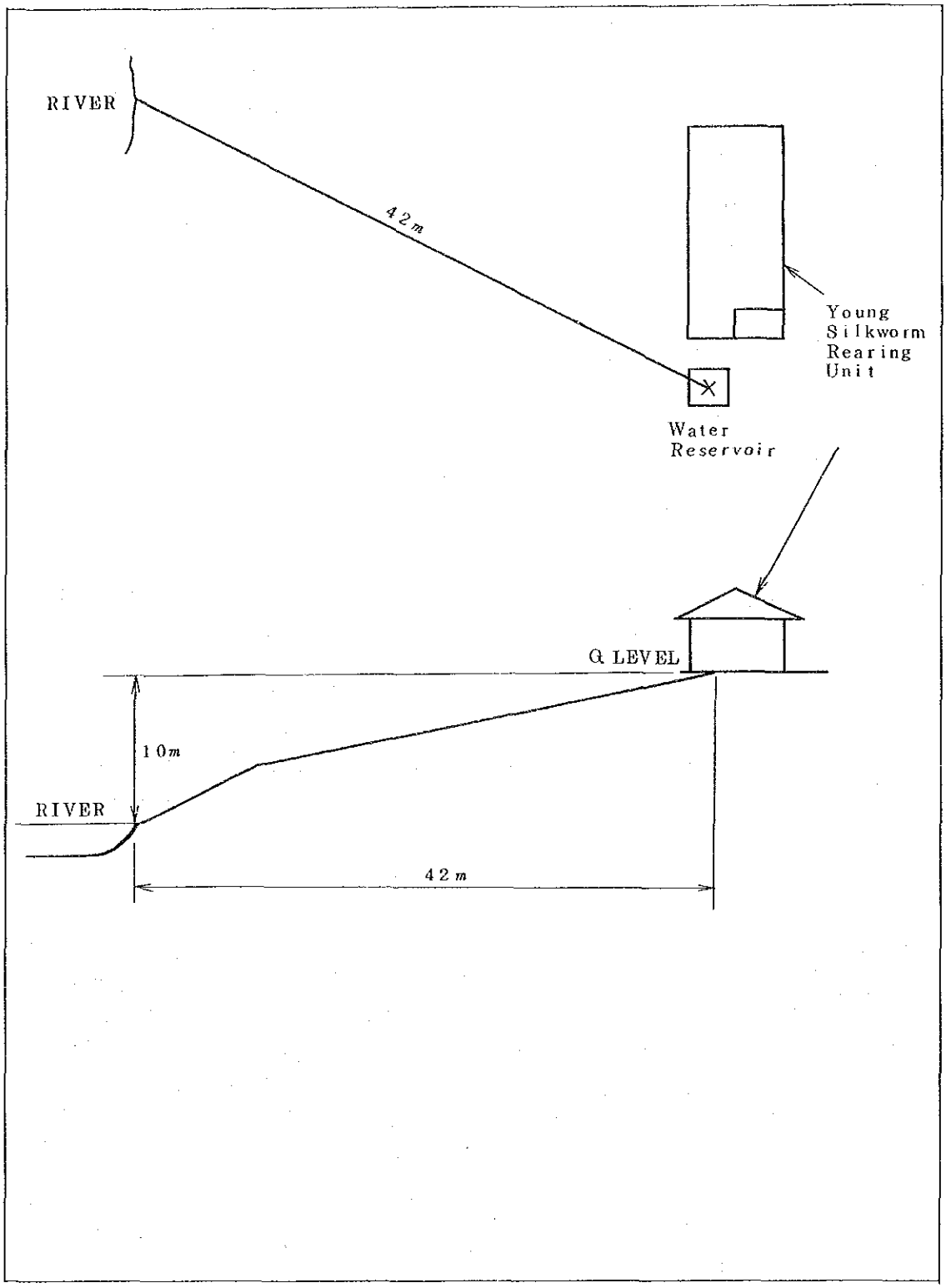
Baraka Pilot Unit

(Water Supply)

1983. 11. 11

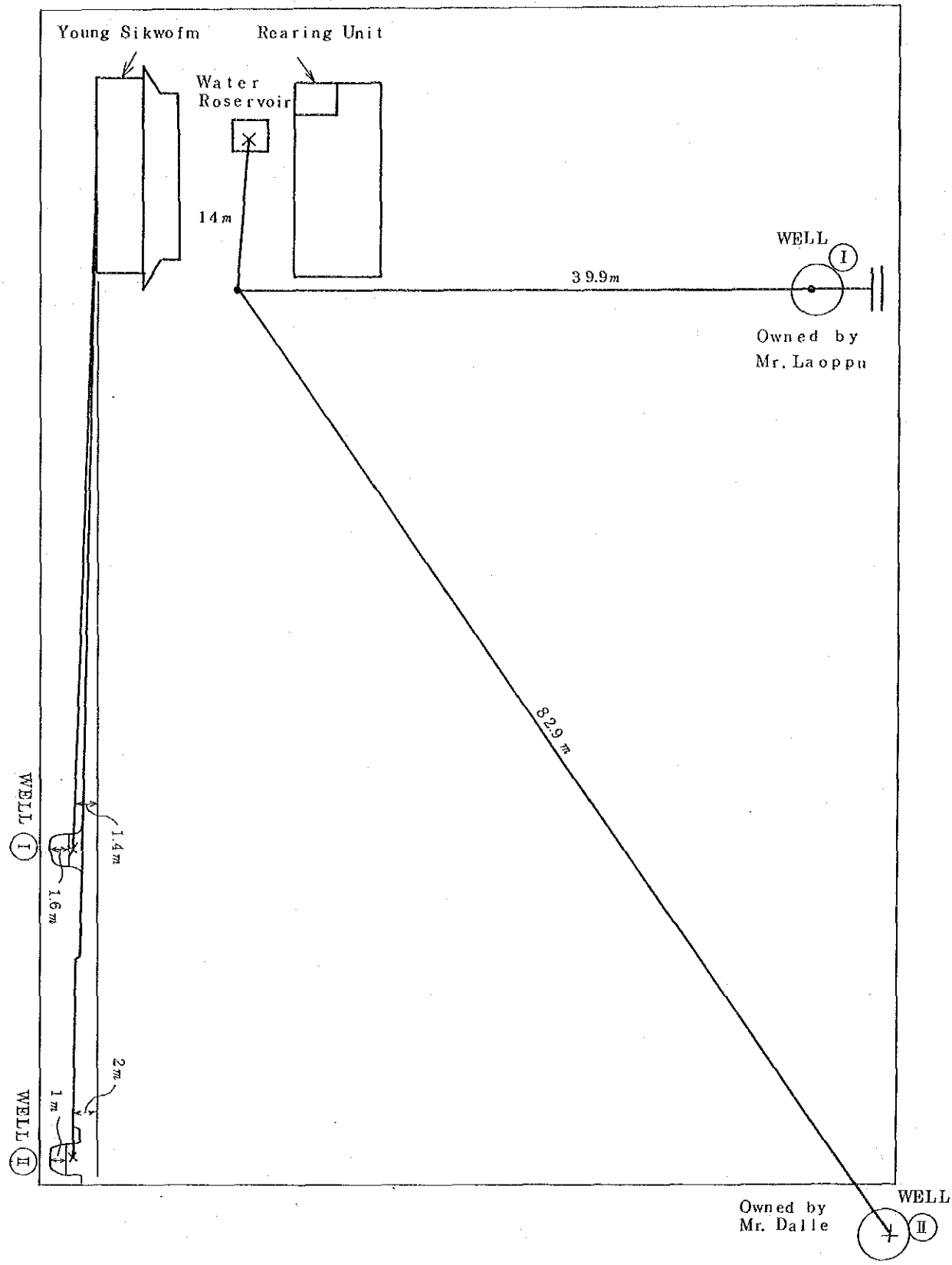


図－4

Luppange Pilot Unit

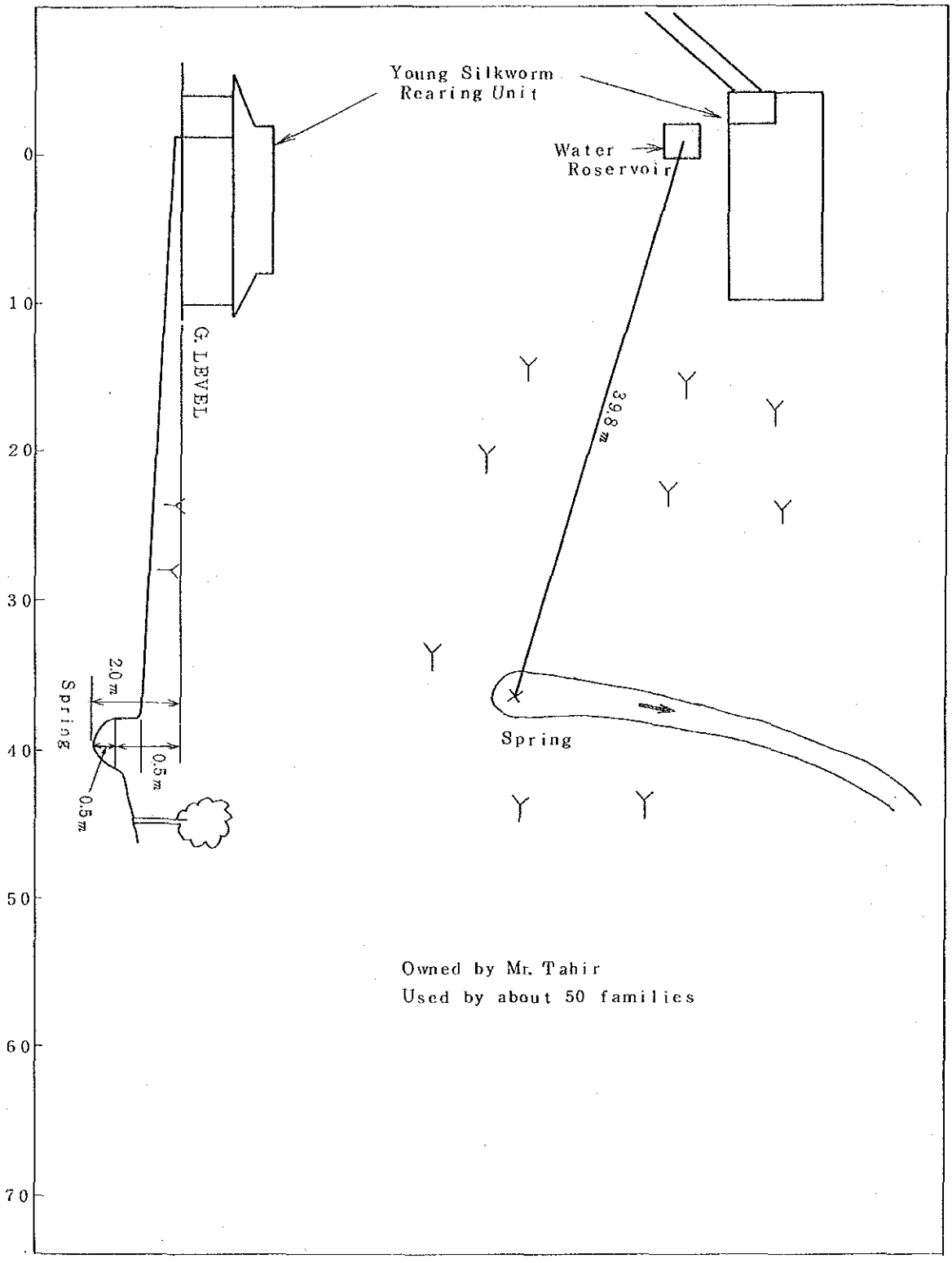
(Water Supply)

1983. 11. 9



Pising Pilot Unit
(Water Supply)

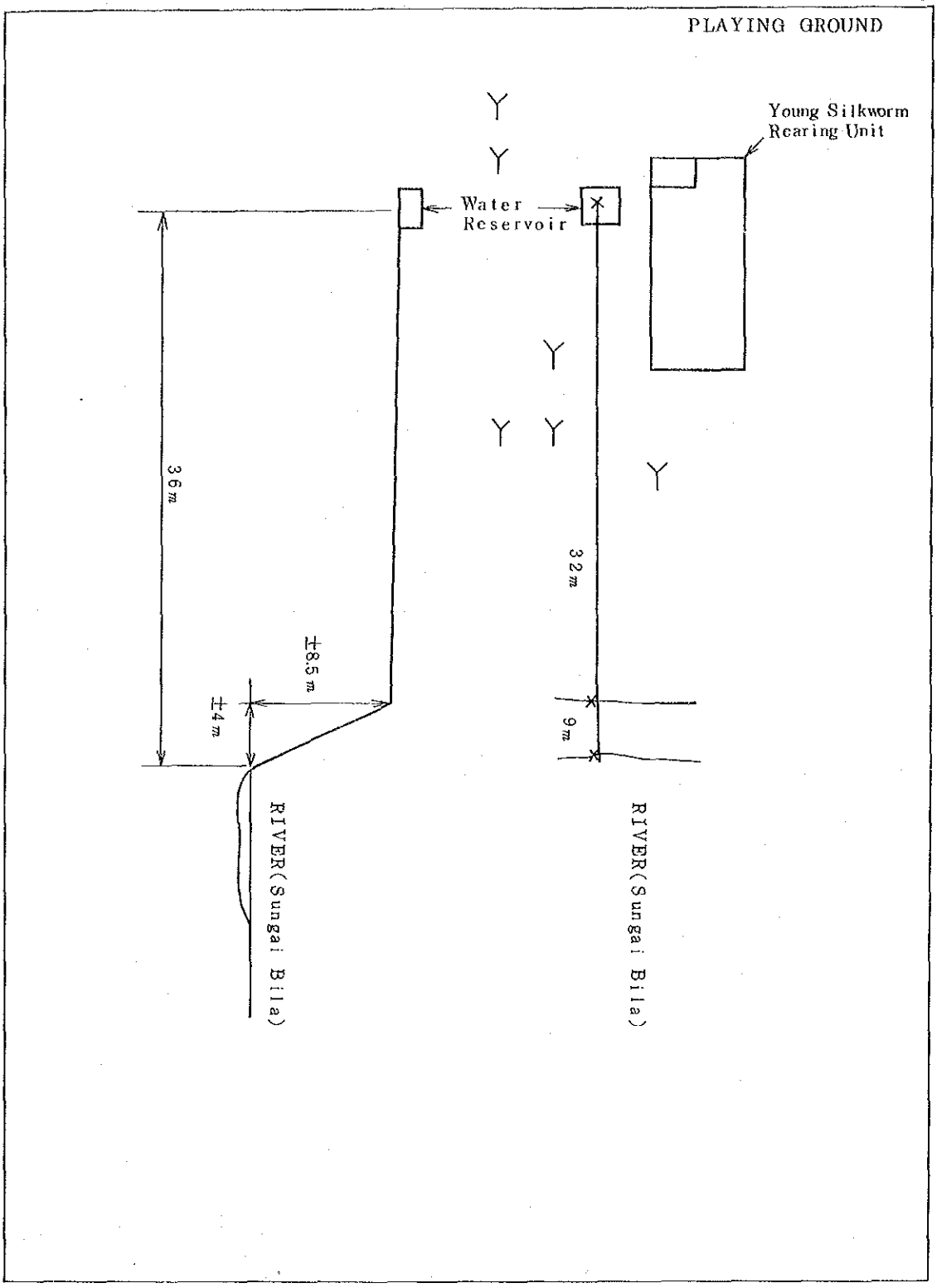
1983. 11. 9



Owned by Mr. Tahir
Used by about 50 families

Ugi Pilot Unit
(Water Supply)

1983. 11. 10



図－7

Wanio Pilot Unit

(Water Supply)

1983. 11. 10