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NOTE OF UNDERSTANDING AND RECOMMENDATION

OF

THE JOINT EVALUATION

SERICULTURAL DEVELOPMENT PROJECT IN INDONESIA

C O N T E N T S

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REFERENCE MATERIALS

I. SERICULTURAL TECHNOLOGY DEVELOPMENT PROGRAMMES IN INDONESIA

(1984/1985 - 1988/1989).

I Introduction :

The Sericultural Development Project in Indonesia was started under the Record of Discussion on March 30, 1976, and the Agreement between the Government of Japan and the Government of the Republic of Indonesia concerning technical cooperation in the field of sericulture was signed on February 28, 1978, for five year technical cooperation.

In order to attain the objectives of the project, the Government of Japan, through Japan International Cooperation Agency, has carried out technical cooperation activities in the fields of moriculture, silkworm rearing, silkworm egg production and control of pests and diseases by means of dispatching Japanese experts, trainning Indonesian experts in Japan, supplying equipment & materials; and the Government of Indonesia carried out their roles by constructing Sericultural Center, Sub-Center and other necessary facilities, preparing project personnel and allocating project budget for its operation.

II Objectives of Evaluation :

Leaving five months more till the termination of cooperation period on February 27, 1983 as stated in the Agreement, the Japanese Evaluation Team (refer to annex I) has visited Indonesia from September 9 to October 8, 1982, to carry out overall review and evaluation of project performances, together with Indonesian Evaluation Team (refer to Annex II), and make recomendation on the measures to be taken by respective government in the near future.

III Methodology of Evaluation

1. Evaluation on project performance was carried out, taking September 1, 1982 as a base date.
2. Concerning organizations for this evaluation are as follows ;
   1. Directorate of Reforestation and Rehabilitation, Directorate General of Forestry, Department of Agriculture
      (a) Sericultural Center (Bili-Bili, Pakatto)
      (b) Sericultural Sub-Center (Tajuncu, Tanah Bellange)
   2. 5 Pilot Units (including young silkworm rearing houses)
   3. Sericultural farmers in South-Sulawesi

3. Evaluation was conducted.....

3. Evaluation was conducted based on "The working plan" originated from master plan of the Agreement.
Subject of evaluation are as follows :

(1) Concerning research, experiment and demonstration activities, evaluation was carried out on technical transfer from Japanese experts to Indonesian experts, technical staffs and other concerning personnel.

(2) Concerning the dispatch of Japanese experts, training of Indonesian experts in Japan and supply of equipments & machinery, reviews were carried out on the actual performances in comparison with the working plan.

(3) Concerning Indonesian experts, land, buildings, facilities and Joint Committee, reviews were carried out on the actual performances achieved by Indonesian side.

(4) Concerning other aids made by Japanese side such as the grant aid, model infrastructure works and emergency countermeasure allocation, reviews were carried out on the actual performances made by Japanese side.

(5) Concerning the measures to be taken after the termination of cooperation period, exchange of opinions was carried out on the goals and contents of subjects which have not yet been completed, together with the methodology of further execution.

IV Proceeding of discussion:

The Indonesian evaluation team presented the overall view of the technological development of sericulture in Indonesia which also includes the subjects not covered by cooperation project (Reference material I).

Although some of those subjects are not covered by the present cooperation project, members of both Indonesian & Japanese evaluation teams recognized the importance & necessity of those subjects to berealized by Indonesian Government for further development of sericulture in Indonesia.

V Results of Evaluation :

The progress of the working plan, based on the master plan of the Agreement, achieved by Indonesian and Japanese experts, has shown satisfactory results, though some subjects had been behind the schedule at the earlier half

of the Agreement.....

of the Agreement period, and there are still some problems and subjects that must be solved or completed.

1. Results of evaluation, on individual technical items shown in Annex III, are summarized as follows (Remark : 1) * Items with this marks have attained their goals partially satisfactorily but partially unsatisfactorily.
2) C is Sericultural Center 3) S is Sericultural Sub-Center)

(1) The items which goals have been achieved are as follows.

(a) The items which have attained enough progress are as follows (Grade A)

C-a-1 Establishment and management of mulberry field.
C-b-1 Investigation into the economical character of mulberry varieties.
* C-c-1 Artificial hatching and incubation method (of preservation and treatment tehniques of silkworm eggs)
C-c-2 Comparison of silkworm races.
C-c-3 Rearing technique of young silkworm
C-c-4 Rearing technique of grown silkworm
* C-c-5 Improvement of mounting technique (of silkworm mounting technique and improvement of cocoon quality)
C-c-6 Investigation into the ecology of silkworm diseases
C-c-7 Control method of silkworm pests and diseases
C-d-2 Pebrine inspection technique
C-e-2 Training of technical staffs
C-f-1 Planning of demonstration in mariculture
C-f-2 Planning of demonstration in silkworm rearing
C-f-3 Planning of demonstration in pests and diseases control
S-a-3 Local adaptability test of silkworm races
S-a-4 Investigation into the ecology and control of silkworm diseases

(b) The items which have attained almost satisfactory progress are as follows (Grade B)

C-b-3 Control method of mulberry pests & diseases
C-d-1 Silkworm egg production
C-d-3 Scheme for silkworm egg production and distribution
C-e-1 Training of Indonesian experts
1. Practical training can be performed satisfactorily

2. Planning of .....

2. Planning of experiment, execution and conclusion of results can be performed fairly satisfactorily

3. Technical development capability is insufficient

S-c-2 Pebrine inspection technique

S-e-2 Survey on the actual condition of sericultured farmers

(2) The items which are delayed in the progress of performance are as follows (Grade C)

C-b-2 Promotion of soil fertility and techniques for the maintenance of mulberry field

C-b-4 Training and harvesting method of mulberry for young and grown silkworm

*C-c-1 Preservation method of artificially hibernated silkworm eggs (of preservation and treatment techniques of silkworm eggs)

*C-c-5 Cocoon quality improvement technique (of silkworm mounting technique and improvement of cocoon quality)

S-a-1 Mulberry cultivation method

S-a-2 Control method of mulberry pests and diseases

S-c-1 Silkworm egg production and distribution

S-c-3 Mulberry scion production and distribution

S-d-1 Training of Indonesian experts for the training of technical staffs and sericultural farmers

S-e-1 Demonstration activities at pilot units

S-e-3 Technical assessment of sericultural farmers

2. As the latest activities of this project, demonstration of sericultural techniques at pilot units and their members started in March, 1982. And we came to recognize that the techniques of silkworm rearing and some techniques of mulberry leaf production are being transfered to pilot unit farmers through their demonstration farmers, though cocoon production seems to be still unstable due to imcomplete technical extension services to farmers' level.

The farmers are expanding their mulberry fields for bigger size of silkworm rearing. Therfore, what the most important now is to transfer the demonstration techniques satisfactorily to pilot unit farmers at 5 pilot units.

3. Concerning.....

3. Concerning the dispatch of Japanese experts, 19 experts have been sent on long-term assignment, while 27 experts have been sent on short-term assignment. It is recognized that the experts had been sent adequately as planned, and had contributed much to the performances of the project.

4. All Indonesian experts, except newly appinted Indonesian experts, have been trained in Japan. In particular, 2 Indonesian experts are now carrying out brush-up training in Japan, to improve their capability in technical development. However, It is considered necessary for the Indonesian experts to receive further trainings in order to deepen their technical knowledge and to carry out this project independently under their technical leaderships.

5. Concerning the supply of equipments and machinery, cocoon testing machines have not yet been installed, but they are being installed at present by Japanese short-term experts working at Bili-Bili Center. However, the technical transfer in the cocoon testing method is still to be continued. In addition, it is very important to ensure the maintenance of other equipment and machinery.

6. Concerning the other aids (grant aid, model infrastructure and emergency countermeasure allocation), water supply facilities, erosion control works and other urgently required important works have been carried out by Japanese side.

7. Indonesian side assigned 19 Indonesian experts (including 2 experts within one year after assignment) as counterparts to Japanese experts, though assignment was delayed compared with the original schedule.

8. Indonesian side constructed buildings and facilities at Bili-Bili Center, Soppeng Sub-Center and pilot units together with the construction of mulberry fields, though some works were delayed and completed only lately. It is very important to equip and maintain water suppy facilities completely in order to carry out mass production of silkworm eggs smoothly. In addition, the pilot unit activities have just been started due to the delay in the construction of young silkworm rearing houses.

9. The Joint Committee has held its sessions 5 times in order to prepare annual working plans, as well as to evaluate and consider yearly performances and administration of this project.

10. Indonesian Government has allocated Rp 3.175 million (including national project, provincial project, presidential aid, ATA-72 and 1982/1983 fiscal year budget) since 1976, and have contributed much to the performances of the project.

VI Future measures and recommendation :

1. This project is to terminate on February 27, 1983. However, in consideration of the objectives and background described in the master plan of the Agreement, it is recommended to both Japanese and Indonesian Government that the technical cooperation period should be extended for another two years after the termination of the present cooperation period stated in the Agreement.

2. We recognize some important activities that should be carried out after the termination of the present cooperation period.
They are :
   (1) Mulberry cultivation and harvesting methods
   (2) The improvement of cocoon and cocoon filament quality
   (3) Silkworm egg mass production techniques
   (4) Training of Indonesian experts for the training of technical staffs and sericultural farmers
   (5) Control of mulberry pests and diseases.

3. It is desired that the project organization & menagement should be improved, so that the project activities can be conducted more efficiently & effectively.

4. To make the technological results of cooperation project more effectively, some further steps in sericultural development should be taken especially by Indonesian authorities concerned.

J a k a r t a
October 5, 1982

Ir. Apandi Mangoendikoro
Director,
Directorate of Reforestation
& Rehabilitation
Directorate General of Forestry,
Department of Agriculture

Mr. Takuo Tsuchiya
Leader,
Japanese Evaluation Team

ANNEX I LIST OF JAPANESE EVALUATION TEAM MEMBERS

1. Mr. TAKUO TSUCHIYA	Team Leader Councillor,Minister's Secretariat and Agricultural Production Bureau Concurrently, M.A.F.F.
2. Dr. Hideo Ooi	Sericulture in General Director, First Liaison Section, Research Planning and Coordination, Sericultural Experiment Station, M.A.F.F.
3. Mr. Erio Mitomori	Extension of Sericulture Assistant Director, Sericulture Division, Agricultural Production Bureau, M.A.F.F.
4. Mr. Kazuo Ashizawa	Cooperation Planning International Cooperation Division, International Affairs Department, Economic Affairs Bureau, M.A.F.F.
5. Mr. Takamasa Hayase	Coordination Livestock Development Division, Agricultural Development Cooperation Department, J.I.C.A.
6. Dr. Minoru Fujii	Spread of Sericultural Technique Director, Environment Department, Dainichi Consultant Co. Ltd.

ANNEX II

LIST OF INDONESIAN EVALUATION TEAM MEMBERS

1. Mr. APANDI MANGOENDIKORO	Team Leader Director, Directorate of Reforestation and Rehabilitation Directorate General of Forestry, Department of Agriculture.
2. Mr. RAFIOEDDIN ACHLIL	Member Directorate of Reforestration and Land Rehabilitation, Directorate General of Forestry, Department of Agriculture.
3. MR. RAMELAN BUDIAWAN	Member Directorate of FORESTRY PLANNING Directorate General of Forestry Department of Agriculture.
4. MR. SOERYADI SUGOTO	Member Bureau of Planning, Secretariat General, Department of Agriculture.
5. MR. KOMAR SOEMARNA	Member Forest Research Institute, Agricultural Research and Development Agency, Department of Agriculture.

- oOo -

Reference Material 1

Sericultural Technology Development Programs in Indonesia (1984/1985 - 1988/1989)

To stabilize and to get effectiveness of the achievements made by ATA - 72, Indonesian Evaluation Team thinks that is necessary to improve the technical development program in a near future as enclosed in reference material 4 of the Fifth meeting of Joint Committee,
They are:

1. Scholarship for post-graduate study for at least 5 best personnels. Prior to the availability of these, the assistance of foreign experts to manage the technological development activities are still needed.
2. Training the Indonesian personnel in egg production management by foreign experts.
3. Education and training for Indonesian personnel both overseas and domestic in breeding technology for silkworm as well as mulberry.
4. With the assistance of foreign experts, introducing and developing reeling and spinning technology appropriate with the Indonesian condition.
5. Developing of extension system and technique, equipped with facilities in accordance with Indonesian farmers condition.The knowledge of sericulture farm management is highly essential in the system.
   Expert assistances and facilities from developed countries are required in this case.
6. Setting a National Sericulture Promotion Program based on a thorough study to support the all point above mentioned.

ANNEX III

RESULTS OF EVALUATION ON INDIVIDUAL TECHNICAL ITEMS

Sericultural Center

C-a Construction and management of mulberry fields.

C-a-1 Establishment and management of mulberry fields - Grade: A

(Scheduled year of execution 1978-1982; Year executed 1978-1982)

° 7.5 Ha mulberry field was constructed as planned at Bili Bili & Pakato.

° 1.4 Ha grass-land was constructed as planned.

° Utilization of agricultural machinery: Utilized efficiently

° Maintenance of mulberry fields: Maintained fiarly well.

* Remaining subjects & countermeasures:
Careful operation & maintenance of agricultural machinery are required.

C-b Trial experiments to develop techniques for mori culture and for the control of pests & diseases of mulberry.

C-b-1 Investigation into the economical characters of mulberry races. - Grade: A

(Scheduled year of execution 1978-1982; Year executed 1979-1982)

° Selection of superior races: M. alba & M. cathayana were selected from among local races as recommended races.

° Method of propagation : Scion production method was established.
Scion production method using field grafting was established.
Scion production field was constructed.

° Investigation into growth characters: General growth characters of mulberry became clear.

* Remaining subjects & countermeasures:

1. Construction of the scion production field for M. Cathayana.
2. Collection of more mulberry races and study on them.
3. Selection of mulberry races for highland.
4. Scion production & distribution in main sericultural regions.

C-b-2 Promotion of soil fertility, and techniques of the maintenance of mulberry fields - Grade: C
(Scheduled year of execution 1978-1982; Year executed 1981-1982.

° Promotion of the soil fertility of mulberry field: Survey & analytical activities on mulberry field soils of main sericultural regions are now being performed.

° Mulberry maintenance method with less fertilization: Effect of urea application and its economical amount of application became clear.

° Study on the feasibility of mulberry fields: Survey on physical & chemical characters of mulberry field soils of main sericultural regions was performed.

* Remaining subjects & countermeasures:

1. Study on the effect of three macronutrients has just started, therefore has to be continued.
2. Study on the effect of organic manure application & its application method is necessary to be conducted.
3. Studies on harvesting & fertilization methods suitable with the local soil & climatic conditions are necessary.
4. Study on the soil fertility promotion method for newly expanding sericultural regions based on soil survey & analysis is necessary to be conducted.

C-b-3 Control methods of mulberry pests & diseases - Grade: B
(Scheduled year of execution 1978-1982; Year executed 1980-1982)

° Study on main mulberry pests: Four main insect - pest were identified.

° Study on main mulberry diseases: Survey activities on main mulberry diseases were conducted.

° Control methods of main pests & diseases of mulberry: Effects of agronomic measures were proven, and safety standard of effective insecticides was established for the control of insect-pests. Experiments for the control of mulberry diseases are being conducted.

* Remaining subjects and countermeasures:
Investigations into the selection of agricultural chemicals and the agronomic measures for the control of mulberry diseases are necessary.

C-b-4 Training and harvesting methods of mulberry for young and grown silkworms - Grade: C
(Scheduled year of execution 1978-1981, Year executed 1978-1982)

° Training & harvesting methods of mulberry for young silkworn: training & harvesting methods adapted to the actual rearing period were established.

° Revitalization method of mulberry growth vigor: Downward prunning was found out to be effective for the revitalization of mulberry growth vigor and for the control of some insect-pests.

° Mulberry harvesting scheme: Experiments on the harvesting system for rearing six times a year were conducted.

° Planting density: Planting density of more than 10.000 mulberry plants per hectare was found out to be suitable under poor fertilization situation.

* Remaining subjects & countermeasures:

1. Level of downward prunning should be made clear to get the best result on both pest-control and amount of leaf production.

2. Planning of silkworm egg production & definition of silkworm rearing seasons are closely related with yield estimation of mulberry leaves (harvesting frequency, harvesting time etc.) throughout a year. However, due to non-resting period of mulberry needed for its revitalization, and non-understanding of mulberry growth characters during dry season & yield fluctuation throughout a year, the yield estimation method has not yeet been established. With this situation, yield estimation method is regarded as an important subject that should be worked out earlier.
   For the establishment of yield estimation method, accumulation of data is necessary.

C-c Trial experiments to develop techniques for silkworn rearing and for the control of pests & diseases of silkworns.

C-c-1 Preservation and treatment techniques of silkworn eggs. - Grade: A & C
(Scheduled year of execution 1978-1982, Year executed 1978-1982)

- Artificial hatching method: Acid treatment method, acid treatment method after chilling and their relative techniques have been established.
- Incubation method: Incubation method and its relative techniques in accordance with the actual rearing period were established.
- Preservation method of artificial hibernation eggs: Experiments on preservation time & preservation period of artificial hibernation eggs are being conducted.

* Remaining subjects & countermeasures:

1. For the steady supply of required amount of silkworm eggs at required time, acid treatment method & acid treatment method after chilling are not enough to meet the demand of farmers, therefore establishment of long-term preservation method of artificial hibernation eggs is necessary, since this method enable to supply silkworm eggs after certain period of preservation. Experiment on the preservation of artificial hibernation eggs is still at the beginning stage, and has to be worked out at the earliest time possible for earlier practical application of its techniques.
   For the longer preservation of siklworm eggs, steady & continuous operation of refrigeration system is required, thus careful maintenance of refrigeration system is required.

C-c-2 Comparison of silkworn races - Grade: A
(Scheduled year of execution 1979-1982, Year executed 1979-1982)

- Comparison on the adaptability of F2 silkworm races: Comparison between some F2 silkworm races was conducted based on the original master plan.
- Comparison between superior hybrid silkworm races: By reviewing the master plan of the project, selection of superior Fl silkworm races was started, because the capability of F2 races were found out to be inferior to imported Fl races.
  As a result, 8 BN race & 7 BC race parent strains were chosen, and ultimately BN2 x BC 102 was selected from among all cross breeding.

In addition, a superior double cross was selected for the efficient egg production.

° Maintenance of the capability of parent silkworm: Maintenance of the capability of selected silkworms has been carried out by intra-batch crossing.

* Remaining subjects & countermeasures:

1. Higher breeding techniques are needed for the maintenance of the capability of silkworm races.

C-c-3 Rearing technique of young silkworm - Grade: A (Scheduled year of execution 1978-1981; Year executed 1978-1981)

° Planning of the model house for young silkworm rearing: Young silkworm rearing house Model 1 was constructed using locally available construction materials, and its adaptability experiment was conducted.

° Establishment of locally adapted standard techniques: Standard technical system for young silkworm rearing was formulated.

° Local preparation of young silkworm rearing materials: Rearing stands & trays were invented locally. Adaptability test of damp-proof paper, practical body disinfection method using high-grade-bleaching powder (Calcium hypochlorite) and utilization of ani-ani for harvesting mulberry leaves were studied and their efficiencies were proven.

* Remaining subjects & countermreasures:

1. For the steady harvest of cocoons, survey of micro-climate inside rearing houses and the formulation of rearing techniques based on the actual condition of micro-climate inside rearing houses are necessary.

was completed, while adaptability of natural mounting method was proven. In addition, improved bamboo cocooning frame was invented, its practical utilization was tested and efficiency was proven.

° Cocoon quality improvement technique:
Method to avoid inferior cocoons by harvesting cocoons at the proper time was established.

* Remaining subjects & countermeasures:

Cocoon quality testing method is still to be established. Practical training for cocoon quality test is important.

C-c-6 Investigation into the ecology of silkworm diseases:
(Scheduled year of execution 1978-1982: Year executed 1978-1980)

° Survey on the occurring treand & ecological characters of main silkworm diseases:
Actual prevalence situation of flacherie & jaundice was made clear.
Prevalence of pebrine disease was drastically decreased due to the distribution of pebrine - free silkworm eggs.

* Remaining subjects & countermeasures:
None

C-c-7 Control method of silkworm pests & diseases - Grade: A
(Scheduled year of execution 1979-1982; Year executed 1979-1982)

° Control methods of main silkworm diseases:
Disinfection methods of rearing rooms, rearing tools & silkworm - bodies were established as anti-flacherie infection measures.

2. Since locally available damp-proof paper is not satisfactory enough in quality, further surveys & investigations are necessary for keeping fed leaves free from withering for longer time.

C-c-4 Rearing technique of grown silkworm - Grade: A
(Scheduled year of execution 1978-1982; Year executed 1978-1982)

- Planning of the model house for grown silkworm rearing: Grown silkworm rearing house model 1 was constructed using locally available construction material, and improved model 2 was constructed by improving model 1, then its adaptability experiment was conducted.
- Formulation of standard rearing techniques: While formulating standard grown silkworm rearing method, improvement of rearing method under the elevated floor of farm-houses was performed. Practical experiments on the disinfection of rearing room, rearing tools & silkworm-bodies, and experiment on leaf-on-shoot feeding method were also performed.

* Remaining subjects & countermeasures:
Survey & investigation on anti-wither method of mulberry leaves using locally available materials are necessary.
Study on mulberry - leaf feeding method in accordance with actual environmental - climatic conditions is necessary.

C-c-5 Silkworm mounting technique and improvement of cocoon quality - Grade: A & C
(Scheduled year of execution 1979-1982: Year executed 1979-1982)

- Improvement of mounting techniques: Establishment of "Jobarai" (collection of matured larvae by shaking mulberry shoots) mounting method

° Selection of fungicides for silkworm body disinfection: Fungicide for the control of flacherie was studied.

* Remaining subjects & countermeasures:
Surveys & investigations into locally available silkworm-body disinfection chemicals are necessary.

C-d Production of silkworm eggs and their distribution to the Sub-Center

C-d-1 Silkworm egg production - Grade: B
(Scheduled year of execution 1978-1982; Year executed 1978-1982)

° Parent silkworm rearing method: Standardized parent silkworm rearing method was established.

° Egg production technique: Handling of cocoons for egg production, eclosion control, pupa sex discrimination and other basic techniques, method of egg raising with separated batches and group egg raising method were established.

* Remaining subjects & countermeasures:

1. Measures for the avoidance of pathogen contamination & control of silkworm diseases are necessary to be applied around parent silkworm rearing places.
2. Establishment of loose egg production method is necessary as mass silkworm egg production technique which includes the selection or invention of egg-lying paper, egg transportation method etc.

C-d-2 Pebrine inspection technique - Grade: A
(Scheduled year of execution 1978-1982; Year executed 1978-1982)

° Establishment of mother moth pebrine inspection technique:

Predictive inspection method, Individual moth inspection method & mass moth inspection method were established.

° Compilation of inspection manual & distribution of pebrine-free silkworm eggs:

Manual of pebrine inspection was completed, and the pebrine-free silkworm eggs inspected based on inspection manual were distributed.

* Remaining subjects & countermeasures:

None

C-d-3 Scheme for silkworm egg production & distribution - Grade: B
(Scheduled year of execution 1980-1982; Year executed 1980-1982)

° Investigation into the demand of silkworm eggs & planning of egg distribution:

Basic plans for the production of silkworm eggs at the time of requirement, and for the preservation method of eggs were made.

* Remaining subject & countermeasures:

Annual silkworm egg production plan cannot be made yet, since there has been no definite information on the amount of silkworm eggs consumed.

C-e Training of Indonesian technical staffs

C-e-1 Training of Indonesian experts - Grade: B
(Scheduled year of execution 1978-1982; Year executed 1978-1982)

° Practical training:

All section can perform satisfactorily.

° Planning of experiment, execution & conclusion of results:

All section can perform fairly satisfactorily.

° Capability of technical development & technical guidance:

Fairly satisfactory guidance ability is obtained, though technical development ability is insufficient.

° Textbook compilation:

First edition of textbook in Indonesian language was compilated, and revised edition with new technical information is being compilated at present.

* Remaining subject & countermeasures:

1. Training of newly assigned technical staffs.
2. Chances should be given to them for the improvement of their own technical abilities by preparing technical books, reference materials etc. ready for use.
3. Training on technical field that requires high specialized knowledge, such as breeding of races, is needed.
4. Technical development capability for sericulture in Indonesia.

C-e-2 Training of technical staffs (by Japanese & Indonesian experts) - Grade: A
(Scheduled year of execution 1979-1982; Year executed 1978-1982)

° Almost of all technical staffs have enough capabilities to perform their activities in the techniques developed so far.

* Remaining subject & countermeasures:
Activities should be continued.

C-f Formulation of programme, for the demonstration of sericultural technqiues at farmers' groups

C-f-1 Planning of demonstration in mariculture - Grade: A
(Scheduled year of execution 1980-1981; Year executed 1981-1982).

° Demonstration techniques of mulberry harvesting method for six rearing periods a year: First draft was formulated.

* Remaining subjects & countermeasures:
Formulation of execution plan based on the results of demonstration and development of new techniques is necessary.

C-f-2 Planning of demonstration in silkworm rearing - Grade: A (Scheduled year of execution 1980-1981: Year executed 1980-1982).

° Planning of demonstration in young silkworm rearing method: Formulated demonstration plan based on the developed techniques.

° Planning of demonstration in grown silkworm rearing method: Formulated demonstration plan based on the developed techniques.

° Planning of the management of young silkworm rearing house: Proposed management plan for its efficient operation.

* Remaining subjects & countermeasures:
Formulation of execution plan based on the results of demonstration and development of new techniques is necessary.

C-f-3 Planning of demonstration in pest & disease control - Grade: A
(Scheduled year of execution 1980-1981; Year executed 1981-1982).

° Planning of demonstration in pest & disease control: Formulated demonstration plan based on the developed techniques.

* Remaining subjects & countermeasures:
Formulation of execution plan based on the results of demonstration & development of new techniques is necessary.

Sericultural Sub-Center

S-a Verifying experiments of sericultural techniques developed in the Center.

S-a-1 Mulberry cultivation method - Grade: C
(Scheduled year of execution 1978-1982: Year executed 1978-1982).

- Comparison of mulberry races: Economical characters of six native races were studied, and M. Alba was selected as the most superior race among them.
- Study on the growth and productivity of mulberry: Growth of shoots, time of defoliation & productivity of main races were studies, and characters became clear.
- Mulberry harvesting system: Recommending harvesting time was decided based on three-times-harvesting a year in each mulberry field.
- Light intensity inside mixed crop mulberry field: It became clear that coconut mixture interval should be wider than 16 m x 18 m inside mulberry field.

* Remaining subjects & countermeasures:

1. Yield estimation requires long-term accumulation of data.
2. Definition of harvesting time based on the results of survey and study is required.

S-a-2 Control method of mulberry pests & diseases - Grade: C
(Scheduled year of execution 1978-1982: Year executed 1980-1982)

- Control method of main insect-pests: It was found out that mulberry mealy bug & mulberry pyralid could be reduced by utilizing trimming & downward prunning techniques together with insecticides.

° Control method of main mulberry diseases: Techniques developed at Center are now being tested.

* Remaining subjects & countermeasures:

1. Establishment of the control method of mulberry white scale.
2. Investigations into the actual damage situation caused by mulberry diseases, and the establishment of economical control method are needed to be conducted.
3. Control method of the sudden breakout of insect-pests that disturbs the schedules of sericultural activities of farmers' level is needed to be studied.

S-a-3 Local adaptability test of silkworm races - Grade: A (Scheduled year of execution 1980-1982; Year executed 1978-1982)

° Adaptability test of newly crossed hybrid: Adaptability test of F1 hybrid races selected at Center was conducted and their superiority was proven. In addition, adaptability test of double cross race was performed and its practically was confirmed.

° Comaprison of characters with locally existing races: Locally existing races were mainly polyvoltines, with poor cocoon quality, and contaminated by pebrines. With above circumstances, F2 cross silkworn eggs were produced by rearing imported F1 cross silkworn eggs, but abilities of F2 cross eggs were poorer than F1 cross eggs.

* Remaining subjects & countermeasures:

None.

S-c-1 Silkworm egg production and distribution - Grade:C
(Scheduled year of execution 1978-1982; Year executed 1978-1982)

° Production of F1 silkworm eggs and distribution:
Necessary egg production techniques, such as rearing of parent silkworms, handling of cocoons used for egg production, discrimination of sex, mating work and preservation of silkworm eggs, were established, and as a result, distribution of high quality silkworm eggs became possible.

° Artificial hatching and incubation control:
With the establishment of the techniques of silkworm egg preservation, artificial hatching and incubation control, supply of silkworm eggs became possible to be carried out any time when farmers want.

° Silkworm egg mass production technique:
By establishing the techniques of egg raising method with separated batches and group egg lying method, about 10.000 boxes of silkworm eggs were produced in the fiscal year 1981/82.

* Remaining subjects and countermeasures:

1. Since the production of silkworm eggs per box of parent eggs is fluctuating between 12 boxes and 106 boxes, due to unstable results of parent silkworm rearing and insufficient supply of mulberry leaves, stable production of silkworm eggs is an important technical subject that must be performed earlier, while further consideration is needed for the improvement of project operation system in order to utilize the developed techniques more efficiently.

2. Establishment of loose egg production method is necessary for mass silkworm egg production.

S-a-4 Investigation into the ecology and control of silkworm diseases - Grade: A
(Scheduled year of execution 1972-1982: Year executed 1978-1982)

- Kind of silkworm diseases and their prevalence situation: Kind of silkworm diseases and their prevalence cycle were studied, and confirmed the diseases that require control.
- Investigation of pathogen distribution:

  Distribution of flacherie pathogen, the main silkworm disease, was made clear, and necessary information was collected for the control of disease in the actual silkworm rearing. In addition, jaundice was proven to be occurring throughout sericultural regions.
- Investigation into the locally adapted control method: Disinfection effects by lime coating of rearing rooms and rearing tools were proven. Disinfection effects of Sodium hypochloride and Calcium hypochlorite for rearing place, rearing bed and silkworm body were proven.

* Remaining subjects & countermeasures:
Investigation into the locally available disinfection chemicals is necessary.

S-b Introduction and demonstration of improved sericultural techniques adaptable at farmers level.
This articles had been performed temporarily until pilot units were constructed, and the results of these activities were inserted into the other articles (S-a or S-f).

S-c Multiplication of silkworm eggs and mulberry scions, and their distribution to farmers.

S-c-2 Pebrine inspection technique - Grade: B
(Scheduled year of execution 1978-1982; Year executed 1978-1982)

° Acquirement of pebrine inspection technique:
Acquired individual inspection technique and mass moth inspection technique.

* Remaining subjects and countermeasures:
Sampling inspection method should be applied carefully while watching the prevailing situation of pebrine.

S-c-3 Scion production and distribution - Grade: C
(Scheduled year of execution 1980-1982; Year executed 1980-1982).

° Establishment of scion production field:
Nominated M. Alba as a recommended race, established 42 ares of scion production field, and distributed 90,000 scions in the fiscal year 1981/1982.

° Establishment of distribution system:
Distribution regulation (draft) was made.

* Remaining subjects and countermeasures:
Establishment of the distribution system of recommended races and scion production field in main sericultural regions.

S-d Training of technical staffs and farmers

S-d-1 Training of Indonesian experts for the training of technical staffs and sericultural farmers - Grade: C
(Scheduled year of execution 1979-1982; Year executed 1978-1982).

° Lecture and practice:
Textbook was compilated, and individual Indonesian expert was trained in the planning of practical training and its execution method.

° Execution of the training of guidance technicians and farmers by Indonesian experts:

Twelve training courses were carried out since 1980.

* Remaining subjects and countermeasures:

1. Revision of textbook
2. Practical oriented training is needed.
3. Improvement of the technical level of guidance technicians.
4. Execution of training at pilot unit sites.

S-e Technical guidance activities to the groups of farmers

S-e-1 Demonstration activities at pilot units - Grade: C (Scheduled year of execution 1980-1982; Year executed 1980-1982).

° Demonstration activities at young silkworm rearing houses.

1 Moriculture:
Based on the demonstration techniques (first draft) of moriculture formulated at the Center, pure M. Alba field was established, and the guidance acitivites on the preparation of mulberry for young silkworm were conducted.

2 Silkworm rearing:
Guidance activities were conducted based on the demonstration techniques formulated at the Center.

° Demonstration activities at demonstration farmers:

1 Moriculture:
Selected demonstration farmers and performed guidance activities at sites.

2 Silkworm rearing:
Selected demonstration farmers and performed guidance activities at sites.

With above activities, improved mulberry leaf production by fertilizer application, and stable cocoon harvest were obtained.

* Remaining subjects & countermeasures:

1. Establishment of mulberry field used exclusively for young silkworm rearing is necessary.

2. Formulation of annual mulberry harvesting system and silkworm rearing seasons.

S-e-2 Survey on the actual conditions of sericultural farmers - Grade: B
(Scheduled year of execution 1979-1982; Year executed 1979-1982).

° Performed the survey to find out the actual technical level of farmers and size of their sericultural activities, and studied the problems that should be improved.

* Remaining subjects and countermeasures:

Survey of technical level at farmers level through guidance technicians is needed.

S-e-3 Technical assessment of sericultural farmers - Grade:C
(Scheduled year of execution 1979-1982; Year executed 1979-1982).

° Started preparing proposals that can be used for technical improvement by investigating into the levels of technical diffusion and its achievement performed by each technical section.

*Remaining subjects and countermeasures:
Survey of technical level at farmer's level through guidance technicians is necessary.

インドネシア側エバリュエーションチーム報告書

The report of Indonesian Evaluation Team on ATA-72 ,

After studying the report of the fifth meeting of Joint Committee ATA-72, observing some of the project locations and interviewing the counterparts on Septem - ber 30, 1982 in Soppeng, Indonesia Evaluation Team comes to the following conclu tions :

1. Most of project activities which are stated in the master plan have already been completed however some of them still should be continued as said by Dr. Mori (Team Leader of ATA-72) in the fifth meeting of Joint Committee on September 13, 1982 as follow ;
   a. The silkworm eggs production has not been stable yet and also the distribution thereof.
   b. The sericultural techniques which adapted with the local and socio-economic condition of farmer are still to be developed.
   c. More development is necessary to complete the techniques of moriculture in the aspects of muberry races, scion production and leaf production.
   d. More development is necessary to improve the quality of cocoon and cocoon-filament.
   e. It is felt that the technical ability of the counterpart should be improved further to develop sericultural techniques which are adapted with the socio economic conditions of farmers, and to tranfer their knowledge to the guidance technicians and farmers.
2. According to the above mentioned reasons (point I), Indonesians Evaluation Team suggests the agreement to be extended at ~~least~~ *least* 2 more years.

3. During the extended period, the activities needed to be performed are as follows :

a. To complete the techniques which are still insufficiently developed .

b. To guide and to improve ~~the~~ ability of counterparts such as :

- Improving the techniques which are adapted with the socio - economic condition of farmers concerned
- Transfering the techniques & knowlegde to the guidance technicians and farmers .

4. To stabilize and to get efectiveness of the achievements made by ATA - 72 Indonesian Evalution Team thinks that is necessary to improve the technical development programe in a near future as enclosed in refence material 4 of The Fifth Meeting of - " Joint Committee , they are :

1. Scholarship for post-graduate study for at least 5 best personnels. Prior to the availability of these, the assistance of foreign experts to manage the technological development activities are still needed .

2. Training the Indonesian personel in egg production management by foreign experts .

3. Education and training for Indonesian personel both eversease and domestic in breeding technologi for silk worm as well as mulberry .

4. With the assistance of foreign experts, introducing and developing reeling and spinning technologi appropriate with the Indonesian condition .

5. Developing of extention system and technique, equiped with facilities in accordance with Indonesian farmers condition.

Teh knowlegde of sericulture farm management is highly essential in the system .

Expert assistancies and facilities from developed countries are required in this case.

6. Setting a National Sericulture Promotion Programe based on a though study to support the all point above mentioned .

Ⅲ 第５回合同委員会

JOINT COMMITTEE OF
SERICULTURAL DEVELOPMENT PROJECT
(ATA - 72)

Report of The Fifth Meeting
of
Joint Committee ATA-72

The Fifth Meeting of the Joint Committee ATA-72, held on September 13, 1982 at Directorate General of Forestry in Jakarta, was attended by its members and representatives whose names are listed in the enclosed reference material - R.M. -- (1).

1. Progress report of the project :

Progress report of the project - R.M. (2) -- covering the whole cooperation period since March 30, 1976 (R/D started on March 30, 1976; Agreement signed on Feb. 28, 1978), was presented by Mr. Y. Richard (Project Manager), and detailed information for the past cooperation period was presented by Dr. N. Mori (Jspanese Team Leader).

The contents of their report can be summarized as follows.

(1). Japanese Experts :

(A). 19 long-term experts have been assigned since the start of cooperation, and six of them (Team Leader, Moriculture, Egg Production, Silkworm Rearing, Pest & Disease Control & Liaison Officer) are at present performing their technical cooperation activities.

(B). 24 short-term experts have been assigned up to June 28, 1982, and some short-term experts are expected to be dispatched continuously throughout this year.

(2). Budget of the Indonesian Government :

The total amount of project budget (including National project, Provincial project & ATA-72) since the fiscal year 1976/77 till the fiscal year 1982/83 is Rp. 3,174,770,760,-. This figure includes the salary for project employed personnel.

Budget only for this fiscal year (included in the above figure) is Rp. 703,560,000,-.

(3). Expenses borne by the Japanese Government :

(A). Supplied equipments & materials :

Total amount of equipments & materials supplied by the Japanese Government since the beginning of the project reached roughly

¥ 499,113,044,- plus Rp. 7,793,900,- (local purchase) as of the end of fiscal year 1981/82 (exact amount not available yet). In addition to the above figure, equipments & materials amounting about ¥ 50,000,000,- are expected to be received within this fiscal year.

(B). Grant aid :

During the fiscal year 1977/78, equipments for the irrigation facilities amounting ¥ 100,000,000,- was supplied by the Japanese Government as grant aid.

(C). Model infrastructure & emergency countermeasure allocation ;

Total amount spent by the Japanese Government for model infrastructure and emergency countermeasure works reached Rp.63,072,400,- as of the end of the fiscal year 1981/82.

(4). Indonesian experts and technical staffs :

As of the day of Joint Committee Meeting, there are 19 Indonesian experts and 33 technical staffs assigned in the four technical sections of Center and Sub-Center.

(5). Counterpart training :

Two Indonesian experts, Ir. Zito Sumardjito and Ir. Zulkarnaen Nurdin, are now attending the technical training in Japan for the second time. With the outcome of their more detailed & deeper studies in their respective specific fields, it is hoped that the technical development abilities of their sections (moriculture & egg production) be strengthened further.

In addition to them, Mr. Harmaeni Suhra Gellu, a refrigerator technician, is also receiving the technical training in Japan at present in the field of the maintenance of refrigeration system.

Including this year's three training participants, Japanese Government accepted 27 training participants including obserbation participants (two Indonesian experts were counted twice) as of June 28, 1982, and 17 of them are now working with the project (16 experts and one mechanical technician).

(6). Construction works :

Buildings and other facilities, planned in a Master Plan of the project, were all completed.

Five units of young silkworm rearing houses at Pilot Units have been also completed as of the day of Joint Committee Meeting.

2. Working plan, progress precentage, prospect of achievement, details of achieved subjects, remaining subjects and their countermeasures :

Together with the progress situation of technical activities, remaining subjects and their countermeasures, the working plan for this fiscal year - R.M. (3) - was proposed by Dr. Nobuyuki Mori, to the Committee and accepted by its members.

As a conclusion of his proposal, Dr. Mori suggested that training of Indonesian experts should be continued, while activities in the following four subjects must be strengthened continuously even after the termination of the Agreement period.

a. Technical demonstration activities for farmers.
b. Improvement of cocoon quality (including cocoon quality test).
c. Improvement of the productivity of mulberry field.
d. Strengthening of silkworm egg production.

3. Other materials presented by the project :

(1). Pilot Unit Operation Plan :

Pilot Unit Operation Plan was disclosed by the project. The project also prepared the Plan in Bahasa Indonesia and individual Operation Plan for each pilot unit.
The pilot unit activities are now being carried out based on the Plan.

(2). Mulberry cutting distribution system (concept) :

The concept of mulberry cutting distribution was presented by the project. Cuttings of recommended mulberry varieties are scheduled to be distributed based on the concept.

(3). South Sulawesi Sericultural Promotion Plan (concept) :

The promotion plan for the sericultural industry in South Sulawesi is now being prepared by Japanese experts, Indonesian experts, District Managers and other concerning officials of the project, and scheduled to be completed by the end of February, 1983.

4. Joint Evaluation :

(1). Japanese side informed the schedule, aims & aouthorities of JICA Evaluation Team arriving in Jakarta on September 21, 1982 with 18-day visitation schedule, and requested Indonesian side to nominate their evaluation members who can conduct survey activities together with the Team.

(2). Indonesian side stated that they would request for the two (2)-year extension of the present sericultural cooperation project (ATA-72)

to the Team, in order to transfer all remaining technical activities smoothly to Indonesian project personnel.

(3). All Joint Cimmittee members agreed to recommend the four main subjects mentioned in Articles 2 - a, b, c, d of this report as proposed by Dr. Mori, at Joint Evaluation Meeting to be strengthened after the termination of the Agreement period.

5. Others :

(1). Q - What is ATA-72 going to do with the socio-economic aspect of sericultural industry ?

A - (a). The activities on socio - economic aspect of sericultural industry is not included in the Master Plan of ATA-72.

(b). Forestry research institute, sponsored by the Directorate General of Forestry, is going to conduct the study of economic analysis inlcuding the socio-economical aspect on in sericultural industry this fiscal year.

(c). Directorate General of Forestry is going to sponsor the University of Hasanuddin in making a Master Plan of sericultural industry.

(2). In addition to the request of the two-year extension of the present sericultural cooperation project (ATA-72), Indonesian Government is intending to propose to the Japanese Government an expanded sericultural cooperation project that includes reeling and other important sericultural activities.

(3). Ministry of Agriculture is now discussing with the Ministry of Industry for the development of reeling facilities.

(4). Q - What can we do about the maintenance of key facilities and machinery of Center and Sub-Center ?

A - (a). Japanese side is now taking following steps to make the maintenance of key facilities and machinery assured for the smoother performance of project activities.

(aa). Training of a refrigerator technician in Japan.

(bb). Supply of spare-parts for the key facilities and machinery.

(cc). Transfer of maintenance responsibility of all key machinery from Japanese expert team to Indonesian personnel.

(dd). Japanese experts also agreed that the maintenance of

some key facilities & machinery at Center & Sub-Center is the key for the succes of the proejct.

(b) To train mechanical technicians at the Indonesian Government training institutes.

6. Sericultural Technology Development Programmes in Indonesia (1984/1985 - 1988/1989) :

Indonesian side presented their Sricultural Technology Development programmes for the next five-year development period (PELITA IV) to the meeting as contained in - R.M. (4).

Apandi Mangundikoro
Chairman of
the Joint Committee ATA-72.

第5回合同委員会参加者名簿

R.M. (1)

List of the participants on the 5th Joint Committee meeting
on Sericulture Technical Cooperation Project (ATA-72)
Jakarta, 13 September 1982

No.	Name	Office
1	Ir. Apandi Mangoendikoro	Director, Directorate of Reforestation and Rehabilitation.
2	Mr. K a d o y a	First Secretary, Embassy of Japan
3	Ir. M. Rafiuddin Achlil	Directorate of Reforestation and Rehabilitation.
4	H.A. Hendarin Wargahadibrata	Secretariat of the Directorate General of Forestry.
5.	Ir. A. Sanusi Kusumaputra	First Secretary of Joint Committee
6.	Yohanes Richard B.Sc	Sericulture Development Project.
7.	Ir. Yusuf M.Sc	Directorate of Forestry Programing
8.	Ir. Hendarsun Suryanda Sanusiputra	Directorate of Forestry Production
9	I Nyoman Ardha M.Sc	Bureau of Planning Departemen of Agriculture.
10	Pramono B.Sc	Directorate of Reforestation and Rehabilitation.
11	Ir. Suhendar Wiradinata	Direktorate of Reforestation and Rehabilitation
12	Ir. Achnad Primon	Chief counterpart of egg productior Sericulture Development Project.
13	Dr. N. Mori	Cooperation Project
14	Mr. K. Tominaga	Liaison Officer of JICA
15	Mr. Miyamoto	Refresentative of JICA Jakarta
16	Mr. Yukio Sasaki	Staff, JICA Jakarta Office.

インドネシア養蚕開発計画進捗報告

PROGRESS REPORT OF SERICULTURAL DEVELOPMENT COOPERATION PROJECT BETWEEN THE GOVERNMENT OF INDONESIA AND JAPAN (ATA - 72) 1976 - 1982

1. Introduction

Sericultural Development Cooperation Project was started on March 30, 1976 at South Sulawesi. The project has been going on smoothly as planned by both Governments.

The aim of Sericultural Development Cooperation Project, are :

- Transfer of sericultural technology from Japanese Experts to Indonesian Experts.
- Training of Indonesian Experts either in abroad or in Indonesia
- To produce high quality silkworm eggs.
- Training of Assistant Counterparts and Guidance Technicians.
- Training of sericultural farmers at South Sulawesi.
- To facilitate machinery, equipments and other facilities to achieve the above aim.

Obligation of the Government of Indonesia, are :

- To prepare technical counterparts and other technicians.
- To construct the office building and other necessary buildings
- To prepare the routine expenses needed yearly.

Both Governments have done the respective obligation perfectly. As the result, in the year of 1978, the project already produced some silkworm eggs that are adapted to the Indonesian climate.

During the last 2 years, the project has carried out the production of F1 silkworm egg, then distributed to the farmers at South Sulawesi and Jawa.

Year by year, the production of F1 silkworm eggs increased as demand increased so as not to depend on the import eggs so much.

Sericultural technologies from Japanese Experts were absorbed by 19 Indonesian Experts, 35 High School level assistants, 25 machinery technicians and 50 Guidance Technicians.

Tranfer of technology to the farmer was carried out through the training and the activities at five pilot units which have about 120 members in total.

2. Budget

The expenses needed are shouldered by both Governemnts.

The Government of Japan shouldered the machinery, vehicles & sericultural equipments, and the Indonesian side shouldered project facilities buildings, mulberry field and other operational expenses necessary for the project management.

The total amount of project budget since the beginning of the cooperation is as follows.::

From Indonesian side : Rp. 3,174,770,760,- (including the fiscal year 1982/83)

From Japanese side : ¥ 549,113,044,- plus Rp. 7,793,900,- plus
¥ 100,000,000,- plus Rp. 63,072,400,- (inlcuding the fiscal year 1982/83)
(Japanese figure does not include the salary for Japanese experts and the expenses of counterpart training in Japan).

3. Achievement :

a. The sericultural technology has been absorbed even by Guidance Technicians and most of sericultural farmers, and further developed and/or expanded by Indonesian Experts.
b. The project has bread parent silkworm eggs, and produced Fl silkworm eggs in order to fulfil the high demand of sericultural farmers.
c. The project selected the recommended variety of mulberry, namely Morus Alba.
d. The project already solved the contamination of silkworm diseases which caused the severe damages to silkworm rearing activities.

The above achievements are satisfactory with the target stated in the Agreement, though not all problems were solved yet.
However, these achievements are the basis of economical activity of the sericultural farmers, These achievements are important to perform the guidance service for the farmers, and support the activity of the cocoon processing into the thread, since it's required to be high quality for the production of high quality silk textile.
For details, please see the enclose reference materials.

Ujung Pandang, September 10, 1982,
Project Manager of
SERICULTURAL DEVELOPMENT PROJECT SOUTH SULAWESI
(ATA - 72)

DEPARTEMEN PERTANIAN
PROYEK PEMBINAAN PERSUTERAAN
SULAWESI SELATAN
DIREKTORAT JENDERAL PERKEBUNAN

(YUTAKA [illegible] RICHARD B.Sc)
NIP. [illegible]1708.

(3)－1. 1982／83年度 年間作業計画

Remark for column 4 :
◎ Mostly achievable.
○ Achievable except some portions.
△ Bigger portion remain unachieved.

Working plan ~~(Draft)~~ of ATA-72 for the year 1982/83.
Working plan, Progress percentage, Prospect of achievement, Details of achieved subjects, Remaining subjects and their countermeasures.

1	2	3	4	5	6	7
T h e m e	Scheduled year of activity (original schedule)	Prospective progress percentage by the end of February 1983 (%)	Achievable till the end of Agreement Period	Details of achieved subjects (Finished items) & the subjects to be achieved till the end of Agreement period	Remaining subjects at the time of the end of Agreement period	Countermeasures for the achievement of remaining subjects
SERICULTURE CENTER						
(a). Construction and management of mulberry field. 1. Establishment and management of mulberry field.	78 - 82	90	◎	1. Established: - Mulberry field; Bili-Bili : 3,40 ha Pakatto : 4,15 ha Total : 7,55 ha - Grass land; Bili-Bili : 1,00 ha Pakatto : 0,38 ha Total : 1,38 ha 2. Leaf production (81/82): 41,000 Kg (for 40 boxes)	1. Renewal of mulberry variety. 2. Maintenance of soil productivity. 3. Maintenance & management of agricultural machinery. 4. Maintenance of the growth vigor of mulberry.	1. Replanting from original planting to M. alba or M. cathayana under yearly replanting plan. 2. Introduction of green manure & utilization of grass land. 3. Training of operators, and renewal of machinery by Indonesian budget. 4. Yield estimation & planning of rearing size (boxes of eggs for rearing).
(b). Trial experiments to develop techniques for moriculture and for the control of pests and diseases of mulberry. 1. Investigation on the economical character of mulberry race.	78 - 82	90	◎	1. Selected M. alba from among local varieties as a recommended variety. 2. Considering the nomination of M. cathayana as a recommended variety 3. Distribution of M. alba scion for propagation, and completion of rapid mulberry scion produc-	1. Addition of recommended varieties. 2. Collection of more mulberry varieties. 3. Adaptability test for highland. 4. Diffusion of recommended varieties.	1. Establishment of scion production field for M. cathayana 2. Selection test using lately collected mulberry varieties & strains. 3. Ability test at Malino mulberry field. 4. Establishment of scion (stick for planting) supply organization by establishing scion production fields in the respective main sericul-

1	2	3	4	5	6	7
				tion method using field grafting technique. 4. Performing second varietical selection & establishment of varietical garden.		tural areas.
2. Promotion of soil fertility and techniques for the maintenance of mulberry field.	78 - 82	75	○	1. Fertilization effect & fertilization method of urea (N) 2. Survey & analytical method of mulberry field soil 3. Studying the effect of mulching using napier grass	1. Application of organic manure	1. Study on organic manure materials (green manure crop, mulberry stick waste, weeds etc.) 2. Seasonal distribution of nitrogen in mulberry field soil.
3. Control method of mulberry pests and diseases	78 - 82	85	◎	1. Kinds of insect - pests & situation of damage caused by them 2. Identification of four main insect-pests 3. Confirmation on the existence of natural enemies 4. Elucidation of the life cycle of main insect-pests 5. Selection of proper insecticide for each main insect-pest and definition of safety standard for those insecticides 6. Control techniques of main insect-pests 7. Prevalence of main diseases & situation of damage caused by them 8. Study on the economical importance of main diseases & definition of control necessity	1. Occurrence trend & environmental condition of main insect-pests 2. Continuing screening of insecticides adaptable to mulberry field 3. Agronomic control of main mulberry disease	1. Occurrence & prevalence of main insect-pests 2. Screening of insecticides adaptable to mulberry field 3. Relation between manuring practice & occurrence of main disease
4. Training and harvesting method of mulberry for young and grown silkworm	78 - 81	75	○	1. Planting method, and training & harvesting method of planted year	1. Mulberry growth & rearing seasons 2. Downward pruning method and control of white scale	1. Adjustment with silkworm egg distribution & other farming works 2. Practical experiments on white scale at densely occurring place

1	2	3	4	5	6	7
				tion method using field grafting technique. 4. Performing second varietical selection & establishment of varietical garden.		tural areas.
2. Promotion of soil fertility and techniques for the maintenance of mulberry field.	78 - 82	75	○	1. Fertilization effect & fertilization method of urea (N) 2. Survey & analytical method of mulberry field soil 3. Studying the effect of mulching using napier grass	1. Application of organic manure	1. Study on organic manure materials (green manure crop, mulberry stick waste, weeds etc.) 2. Seasonal distribution of nitrogen in mulberry field soil.
3. Control method of mulberry pests and diseases	78 - 82	85	◎	1. Kinds of insect - pests & situation of damage caused by them 2. Identification of four main insect-pests 3. Confirmation on the existence of natural enemies 4. Elucidation of the life cycle of main insect-pests 5. Selection of proper insecticide for each main insect-pest and definition of safety standard for those insecticides 6. Control techniques of main insect-pests 7. Prevalence of main diseases & situation of damage caused by them 8. Study on the economical importance of main diseases & definition of control necessity	1. Occurrence trend & environmental condition of main insect-pests 2. Continuing screening of insecticides adaptable to mulberry field 3. Agronomic control of main mulberry disease	1. Occurrence & prevalence of main insect-pests 2. Screening of insecticides adaptable to mulberry field 3. Relation between manuring practice & occurrence of main disease
4. Training and harvesting method of mulberry for young and grown silkworm	78 - 81	75	○	1. Planting method, and training & harvesting method of planted year	1. Mulberry growth & rearing seasons 2. Downward pruning method and control of white scale	1. Adjustment with silkworm egg distribution & other farming works 2. Practical experiments on white scale at densely occurring place

1	2	3	4	5	6	7
				2. Length of main trunk & pruning tools 3. Training & harvesting method of mulberry for young silkworm 4. Revitalization of mulberry growth by downward pruning method 5. Planting density of M. nigra 6. Growth characteristics of branches & harvesting method 7. Harvesting scheme for six time rearing a year	3. Yield estimation 4. Mulberry varieties and planting density	3. Collection of data on yield estimation 4. Planting density of M. alba & M. cathayana
(c). Trial experiments to develop techniques for silkworm rearing and for the control of pests and diseases of silkworm.						
1. Preservation and treatment techniques of silkworm eggs.	78 - 82	85	ⓒ	1. Artificial hatching method by common acid treatment 2. Artificial hatching method by acid treatment after chilling 3. Preservation method of artificially hibernated silkworm eggs	1. Preservation period (high - temperature, low-temperature) of artificially hibernated silkworm eggs and hatching percentage. 2. Loosening time of artificially hibernated silkworm eggs and hatching percentage.	1. Continuation of experiments
2. Comparison of silkworm races	79 - 82	85	ⓒ	1. Local adaptability of F_2 hybrid silkworm varieties. 2. Selection of superior characters & breeding method. 3. Selection of locally adaptable parent silkworms, F_1 hybrid silkworms for double cross and double cross silkworm varieties. 4. Maintenance method of the capability of parent silkworms.	1. Investigation into the cocoon filament quality of silkworm varieties. 2. Breeding method of silkworm varieties.	1. Training of reeling personnel for reeling cocoons of parent silkworms. 2. Continuation of the selection of locally adaptable silkworm characters.

1	2	3	4	5	6	7
3. Rearing technique of young silkworm	78 - 81	85	◎	1. Development of locally adaptable improved young silkworm rearing technique. 2. Accomplishment of young silkworm rearing house model I. 3. Local production of iron made rearing stands & trays. 4. Practical performance of silkworm body disinfection with Calcium hypochlorite 60 % powder. 5. Survey of microclimate inside rearing room (young & grown silkworms). 6. Utilization of ani-ani for harvesting of mulberry leaves for young silkworms.	1. Setting up of locally adaptable "Hakitate" (beginning of silkworm rearing) time 2. Rearing technique for high land. 3. Local production of damp-proof paper. 4. Continuation of the survey of microclimate inside rearing room.	1. Setting up of Hakitate time suitable for the harvesting schedule of mulberry. 2. Techniques suitable to the actual temperature & humidity inside rearing room. 3. Introduction of substitute materials for damp-proof paper.
4. Rearing technique of grown silkworm.	78 - 82	85	◎	1. Development of locally adaptable improved grown silkworm rearing techniques. 2.Improvement of rearing facilities under elevated floor of farm house. 3.Trial construction of locally adaptable simple rearing house for grown silkworm & rearing techniques in it. 4. Practical performance of silkworm body disinfection with Calcium hypochlorite 60 % powder. 5. Utilization of locally produced rearing tools & materials.	1. Setting up of locally adaptable rearing seasons throughout a year. 2. Protection method of harvested leaves from withering under high temperature & excessive dryness. 3. Improvement of rearing techniques in the simple rearing house.	1. Setting up of rearing seasons suitable for the harvesting schedule of mulberry. 2. Development of method and materials used for the wither protection of harvested leaves. 3. Avoidance of rat damage inside simple rearing house.
5. Silkworm mounting technique and improvement of cocoon quality.	79 - 82	75	○	1. Collection of matured silkworms by "Jobarai" (shaking larvae from shoots)	1. Improvement of cocoon and cocoon filament quality.	1. Improvement of mounting method & environmental condition during mounting. 2. Enactment of grading for

1	2	3	4	5	6	7
				& transfer method of matured silkworm to bamboo cocooning frame. 2. Uniform distribution of cocooning silkworms within bamboo cocooning frame by turning frame upside down. 3. Improvement of mounting silkworm percentage & cocooning silkworm percentage by putting string outside bamboo cocooning frame. 4. Natural mounting method using bamboo cocooning frame. 5. Improvement of bamboo cocooning frame 6. Prevention of poor quality cocoons by harvesting cocoons at the proper time.		cocoon filament quality & its testing method. 3. Training on the testing method of cocoon filament grading.
6. Investigation on the ecology of silkworm diseases.	78 - 80	90	◎	1. Occuring trend of pebrine disease. 2. Actual prevalence situation & damage situation by silkworm diseases. 3. Prevalence situation of virus disease. 4. Diagnosis technique for silkworm diseases.	1. Ecological investigation into silkworm diseases caused by virus.	1. Survey on the occurrence & prevalence of silkworm diseases in newly expanding sericultural regions.
7. Control method of silkworm diseases and pests	79 - 82	90	◎	1. Completion of the draft of pebrine regulation. 2. Research on the chemicals for the control of Aspergillus disease. 3. Completion of locally adaptable Aspergillus control technique.	1. Selection of locally procurable chemicals for silkworm body disinfection.	1. Survey on the selection of chemicals for silkworm body disinfection.

1	2	3	4	5	6	7
				4. Control of virus disease. 5. Group disinfection system among sericultural farmers.		
Production of silkworm eggs and distribution thereof to the Sub-Center. 1. Silkworm egg production	78 - 82	85	◎	1. Production method of commercial silkworm eggs (F_1 hybrid & double cross). 2. Production method of loose commercial eggs.	1. Long-distance transportation of silkworm eggs & its obstacles. 2. Establishment of loose silkworm egg production method.	1. Study on the means of transportation & egg containers for transportation. 2. Study on the paste & paper quality for loose egg production.
2. Pebrine inspection	78 - 82	90	◎	1. Pebrine inspection method. 2. Predictive pebrine inspection method. 3. Mass moth pebrine inspection method. 4. Pick-out mass moth pebrine inspection method. 5. Completion of pebrine inspection regulation.	1. Enforcement of pebrine inspection regulation.	1. Strict observance of pebrine inspection regulation.
3. Scheme for silkworm egg production.	80 - 82	70	○	1. Annual production plan. 2. Distribution plan of project produced silkworm eggs.	1. Estimation of annual & seasonal egg consumption (boxes) consumed by sericultural farmers.	1. Establishment of silkworm egg distribution system. 2. Adjustment of silkworm egg production time.
(e). Training of Indonesian technical staffs. 1. Training of Counterparts. 1 - 1. Moriculture	78 - 82	70 ～ 85	○	1. Transfer of basic technology. 2. Execution of development research works & reporting works. 3. Training of guidance technicians & compilation of textbook. 4. Technical guidance activities at Pilot Units.	1. Differences in technical development abilities among counterparts. 2. Planning & guidance ability. 3. Compilation of technical reports. 4. Cooperation and conciliation among different sections.	1. Self-consciousness & self-help efforts, and overseas training. 2. Collection of reference books & materials. 3. Technical discussion exchange of opinions & lecture.

1	2	3	4	5	6	7
				5. Management of mulberry fields & guidance activities for assistant counterparts 6. Training in Japan (6 months).		
1 - 2: Silkworm rearing				1. Planning method of experiments, transfer of rearing techniques through training, concluding method of the results of experiments & improvement of guidance ability. 2. Compilation of handbook in silkworm rearing. 3. Training in Japan (6 months).	1. Technical development ability.	1. Training for ability improvement in the planning of local adaptability experiments & new technique development useful to the sericulture activities in this region & whole Indonesia. 2. Technical discussion, exchange of opinion & lecture.
1 - 3: Pest & disease control				1. Technical transfer in the planning of experiments, experiment methods & other basic techniques. 2. Concluding method of experiment results & compilation of technical reports. 3. Training of guidance technicians & compilation of textbook. 4. Control method for pests & diseases of mulberry & silkworm, and guidance activities for assistant counterparts. 5. Training in Japan (6 months).	1. Improvement of technical development ability. 2. Improvement of positiveness in performing research & experiments. 3. Promotion of joint-research works among technical sections.	1. Collection of reference books & materials. 2. Establishment of subjecthood in the execution of activity. 3. Technical discussion, exchange of opinion & lecture.
1 - 4: Silkworm egg production				1. Transfer of basic techniques. 2. Execution of technical development works & compilation of reports.	1. Improvement of abilities in the planning of project operations & guidance activities.	1. Technical discussion exchange of opinion & lecture. 2. Collection of reference books & materials.

1	2	3	4	5	6	6
				3. Guidance activities for assistant counterparts. 4. Training in Japan (6 months).		
2. Training of technical staffs at the Sericultural Center.	78 - 82	70 ~ 85	○			
2 - 1: Moriculture				1. Acquirement of practical mulberry planting techniques. 2. Task allocation in the routine works of mulberry field maintenance work (Guidance activities for workers & planning of work schedule). 3. Ability for assisting technical development works.	1. Improvement in moriculture techniques. 2. Tendency of giving little attention to field works.	1. Technical discussion & guidance through counterparts.
2 - 2: Silkworm rearing				1. Training in practical rearing techniques		
2 - 3: Pest & disease control				1. Acquirement of practical technique for the experiment of pests & diseases of mulberry & silkworm. 2. Work schedule & guidance activity. 3. Ability for assisting technical development works.	1. Improvement in pest & diseases control techniques.	1. Holding of technical discussion for the improvement of technical ability.
2 - 4: Silkworm egg production.				1. Acquirement of egg production techniques.	1. Improvement in egg production techniques.	
(f). Formulation of programme dor the demonstration of sericulture techniques at farmers groups.						
1. Planning of demonstration in moriculture.	80 - 81	80	○	1. First draft of demonstration techniques 2. Pilot Unit operation plan.	1. Readjustment of demonstration techniques. 2. Discovery of problems.	1. Continuation of pilot unit activities & strengthening of guidance activity.

1	2	3	4	5	6	7
2. Planning of demonstration in silkworm rearing	80 - 81	80	○	1. Demonstration of improved rearing techniques developed by the project.	1. Discovery of problems at the spot.	1. Readjustment of techniques after studying data.
3. Planning of demonstration in pest & disease control.	80 - 81	80	○	1. Execution of practical experiments & demonstration. 2. Training of guidance technicians at the spot. 3. Practical training of farmers.	1. Readjustment of demonstration techniques.	1. Promotion of demonstration at pilot units. 2. Enlargement of pilot unit activities.
SERICULTURAL SUB-CENTER (a). Verifying experiments of sericultural techniques developed in the Center.						
1. Investigation on the economical character of mulberry varieties at Soppeng.	78 - 82	70	○	1. Survey on the characters (leaf, branch) of mulberry varieties. 2. Growth & yield of respective mulberry variety. 3. Harvesting schedule for multiple rearing. 4. Survey of sunshine inside coconut-mulberry mix planting field.	1. Difficulties on the collection of experimental data. 2. Insufficient maintenance work of mulberry field.	1. Improvement of environmental condition at Sub-Center.
2. Control method of mulberry pests and diseases.	78 - 82	80	○	1. Practical experiments on the locally adaptable control methods for main insect-pests. 2. Practical experiments on the locally adaptable control methods for main mulberry diseases.	1. Quality of mulberry field maintenance work.	1. Thorough execution of mulberry field maintenance techniques.
3. Local adaptability test of silkworm varieties.	80 - 82	80	○	1. Diffusion of locally adaptable double cross varieties.		
4. Investigation into the ecology and control of silkworm diseases.	78 - 82	85	◎	1. Rearing room & rearing tool disinfection methods were com-	1. Grasping of decreased silkworm number thought to be	1. Continual diagnosis of poorly growing silkworms & dead silkworms.

1	2	3	4	5	6	7
				pleted.	caused by diseased silkworms. 2. Diffusion of disinfection. 3. Propagation of disinfection chemicals.	2. Thorough understanding on the importance of silkworm disease control. 3. Execution of group disinfection.
(b). Introduction and demonstration of improved sericultural techniques adaptable at farmers level.						
1. Improvement of local mulberry planting techniques.	78 - 82	-	-	1. Guidance activities at the spot & establishment of demonstration mulberry field.		1. Introduction of techniques to farmers is expected by demonstrating techniques at Pilot Units, after completing trial experiments at Sub-Center.
2. Silkworm rearing techniques.	78 - 82	-	-	1. Performed trial demonstration of young silkworm rearing techniques by using existing young silkworm rearing house & improving rearing place under the elevated floor of farm house at Unit No. 3, Soppeng.		1. Introduction of techniques to farmers is expected by demonstrating techniques at Pilot Units, after completing trial experiments at Sub-Center.
3. Pest & disease control techniques.	79 - 80	-	-	1. Production of cocoon was increased as the results of disinfection techniques for rearing rooms, rearing tools & silkworms. 2. Execution of the control of main mulberry insect-pests.		1. Introduction of techniques to farmers is expected by demonstrating techniques at Pilot Units, after completing trial experiments at Sub-Center.
(c). Multiplication of silkworm eggs and mulberry shoots for cutting, and distribution thereof to farmers.						
1. Silkworm egg production.	78 - 82	70		1. Mass production & distribution of commercial silkworm eggs.	1. Discovery of the problems of egg production activity. 2. Production increment of F. silkworm eggs per box of parent silkworm eggs.	1. Continual strict observance of the cleaning & disinfection of rearing rooms & rearing tools. 2. Feeding of good quality mulberry leaves. 3. Young silkworm rearing

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					3. Prevention of parent silkworms from pathogen contamination (especially pebrine) by surrounding sericultural farmers. 4. Establishment of loose egg production methods. 5. Dumping system of silkworm faeces, silkworm litters & diseased silkworms.	activities by technical staffs, and selection of egg production workers. 4. Facilities for washing & acid-treatment. 5. Construction of compost shed & incineration facility.
2. Pebrine inspection	78 - 82	80	O	1. Predictive pebrine inspection method. 2. Individual moth pebrine inspection method. 3. Mass moth pebrine inspection method. 4. Pick-out mass moth pebrine inspection method.	1. Enforcement of pebrine inspection regulation.	
3. Scion production & distribution.	80 - 82	70	O	1. Establishment of M. alba scion production field (0,5 ha - Center & Sub-Center). 2. Production & distribution of scions (About 50,000 sticks in 1981/82). 3. Completion of mulberry scion distribution regulation.	1. Control of white scale. 2. Establishment of the scion production field of M. cathayana. 3. Establishment of the propagation system of recommended varieties.	1. Transfer of scion production field to Center where less white scales are seen. 2. Establishment of scion production field at Malino mulberry field. 3. Establishment of transportation system of scion.
(d). Training of technical staffs and farmers. 1. Guidance of Counterparts for training of technical staffs and sericultural farmers at the Sub-Center.	79 - 82	70 ~ 85	O	1. Training of guidance technicians & farmers, and compilation of text book. 2. Training of guidance technicians for Pilot Unit activities. 3. Assistant counterparts performed the practical rearing experiments for the	1. Technical improvement of guidance technicians. 2. Improvement of extension service system. 3. Continuation of training of technical staffs & farmers.	1. Employment of agricultural high-school graduates. 2. Strengthen the training of guidance technicians at Pilot Unit.

1	2	3	4	5	6	7
				training of five guidance technicians in charge of Pilot Units & farmers. Counterparts conducted the training on execution planning & practical technique. They are also conducting guidance activities in the technical demonstration activities in Pilot Units.		
(e). Guidance activities for the demonstration of sericultural technique at the farmers groups (Pilot Unit).						
1. Guidance activities for the demonstration of sericultural techniques.	80 - 82	65	△			
1 - 1: Moricultural techniques				1. Pilot Unit operation plan for five Pilot Units. 2. Establishment of mulberry field for young silkworm rearing & demonstration activities in it. 3. Selection of demonstration farmers & technical guidance for them.	1. Establishment of stronger & substantial organization. 2. Rearing size (boxes of eggs) & estimation of leaf yield.	1. Selection of capable leader. 2. Obligation of establishing communal mulberry field for young silkworm rearing. 3. Mass (group) disinfection system for the control of pests & diseases. 4. Drawing up of simplified leaf yield estimation table.
1 - 2: Silkworm rearing techniques.				1. Guidance activities in young silkworm rearing houses & demonstration farmers of Pilot Units are being performed based on the lately completed rearing techniques for demonstration.	1. Discovery of problems at the spot.	1. Discovery of problems on the diffusion of demonstrated techniques to outside private units and non-member farmers.
2. Survey on the actual condition of sericultural farmers.	79 - 82	75	○	1. Survey on the actual general conditions of farmers by short-term experts. 2. Survey on the actual general conditions of demonstration farmers.	1. Survey on the actual general conditions of farmers through guidance technicians.	1. Preparation & distribution of questionnaires. 2. Continual survey of farmers' actual general conditions.

1	2	3	4	5	6	7
3. Technical assessment of sericultural farmer.	79 - 82	65	△	1. Preparation of the draft of technical assessment in each technical field. 2. Technical assessment at Pilot Units.	1. Survey on the technical situation of farmers through guidance technicians.	1. Strengthening of the collection of statistical data. 2. Continual survey of farmers' actual technical situation.

(3)－2　事業進捗状況，問題点と対策並びに将来提言（第５回合同委員会資料）

事業項目	実施計画年次	進捗状況	到達見通し	成果等の概況	残された問題点	その対策	将来への提言
（養蚕センター） a－1．桑園の建設と管理	78～82	90%	◎	1．造成面積　Bili²　Pakatts　計 桑園　340a　415a　755a 採草地　100　38　138 2．桑葉生産量（81／82） 41,000kg（40箱）	1．桑品種の更新。 2．地力の保持。 3．農業機械の保守管理。 4．樹勢の維持。	1．年次計画による改植M.alba M.cathayana 2．緑肥導入と採草地利用。 3．オペレーター教育，機械更新予算の 4．収量予想と樹立計画。	1．桑園の機械化管理。 2．桑園拡張（平坦肥沃地）。 3．有能な作業員雇用体制と人事管理の強化。
b－1．桑品種の実用形質調査	78～82	90%	◎	1．在イの桑品種から奨励品種としてM.alba選出。 2．M.cathayanaの奨励を検討中。 3．M.albaの穂木生産と掘挿木による穂木速成生産法を速成。 4．第2回品種選抜と品種園を造成中。	1．奨励品種を増やす。 2．桑品種の収集。 3．高原地の適応性検定。 4．奨励品種の普及。	1．M.cathayanaの穂木口造成。 2．新たな品種，系統による選抜試験。 3．Malino桑園での性能検定。 4．主要養蚕地帯に穂木口設置による穂木供給体制。	1．桑育種の実施（技術研修，施設の整備，素材の収集）。 2．飼料価値，蚕質検定，発根機能・抵抗性検定。 3．品種の命名登録制。
b－2．桑園地力増進と肥培管理	78～82	75%	○	1．尿素（N）施用効果と施肥方法。 2．桑園土壌調査と分析。 3．雑草（ネピアグラス）マルチ効果検討中。	1．有機質肥料の施用。	1．有機質資材の検索（緑肥作物・廃条利用，雑草マルチング）。	1．肥料要素と生産力（N.P.K.Ca） 2．土壌改良と桑園造成。 3．土壌診断と生産力検定。 4．災害対策（干害・水害）。
b－3．桑の病虫害防除法	78～82	85%	◎	1．害虫相と加害実態。 2．主要害虫4種類の同定。 3．天敵類の生息の確認。 4．主要害虫の生活史の解明。 5．主要害虫適応殺虫剤の選定，安全基準。 6．主要害虫防除技術。 7．主要病害の発生ならびに被害実態。 8．主要病害の経済的評価と防除の必要性。	1．主要害虫の発生動向と環境条件。 2．桑園適応殺虫剤のスクリーニング。 3．主要桑病害の耕種的防除。	1．主要害虫の発生消長。 2．桑園適応殺虫剤のスクリーニング。 3．肥培管理と主要病害発生との関係を検討する。	1．害虫の総合的防除の樹立。 2．広域的防除組織の確立。 3．主要害虫発生予察報告組織の確立。
b－4．稚蚕，壮蚕用桑の仕立と収穫法	78～81	75%	○	1．植付け法，植付当年の仕立収穫法。 2．主幹の長さ，剪定器具。 3．稚蚕用桑の仕立収穫法。 4．株下げ樹勢更新。 5．桑の植付密度。 6．枝条の生長特性と収穫法。 7．年6回の飼育適応収穫体系。	1．桑の発育と飼育時期。 2．株下げ法とシロカイガラ防除。 3．収量予想。 4．桑品種と植付密度。	1．蚕種配付，他農作業との調節。 2．多発地帯での実証。 3．データーの集積。 4．M.alba，M.cathayanaの植付密度。	1．飼育体系と経営研究。 2．桑の生理生態と収穫体系。 3．桑園雑草研究と除草体系。 4．植付密度と施肥量。 5．農家桑園の造成（作業道を含む）。
c－1．蚕種の保護取り扱い技術	78～82	85%	◎	1．即時受酸孵化法。 2．冷蔵受酸孵化法。 3．人工越年蚕種の保護法。	1．人工越年蚕種の保護期間（高温，低温）と孵化率。 2．人工越年蚕種の洗い落し時期と孵化率。	1．問題点の継続実施。	

事業項目	実施計画年次	進捗状況	到達見通し	成果等の概況	残された問題点	その対策	将来への提言
c－2. 蚕品種の比較	79～82	85%	◎	1. F_1 蚕品種の現地適応性。 2. 優良形質の選抜，育成法。 3. 現地に適した原種，交雑原種および四元交雑種の選出。 4. 原種の性能維持法。	1. 蚕品種の繭糸質調査。 2. 蚕品種の育成。	1. 原種の繰糸者育成。 2. 一粒繰糸機の設置。 3. 現地に適した形質の選抜を継続する。	1. 強健性蚕品種の育成。 2. 品種の性能維持。
c－3. 稚蚕飼育法	78～81	85%	◎	1. 現地適用の稚蚕改善技術の作出。 2. 稚蚕飼育室Ⅰ型の完成。 3. 鉄製の蚕架，蚕箔の現地生産。 4. 高度晒粉による蚕体消毒の実用化。 5. 蚕室内の微気象の調査と対応する飼育技術（稚蚕，壮蚕室）。 6. アニアニの稚蚕用桑収穫への活用。	1. 地域に適した掃立時期の設定。 2. 高標高地の飼育技術。 3. 防乾紙，刻桑機の現地生産。 4. 蚕室内微気象調査の続行。	1. 桑の収穫体系に相応した掃立時期。 2. 蚕室内温湿度に対応する技術。 3. 防乾紙の代替品の開発。	1. 高温，多湿，過乾が稚蚕の発育生理に及ぼす影響と飼育技術。 2. 稚蚕飼育室センターⅡ型の試作。 3. 飼育量の増加に伴う対応（稚蚕桑園や飼育施設の拡充，増設）。 4. 稚蚕飼育所の運営の合理化（収益配分率の是正）。
c－4. 壮蚕飼育法	78～82	85%	◎	1. 現地適用の壮蚕改善技術の作出。 2. 住宅高床下利用の飼育施設の改善。 3. 現地適応の簡易壮蚕飼育施設の試作と飼育法。 4. 高度晒粉による蚕体消毒の実用化。 5. 現地生産の蚕具，資機材の利活用。	1. 地域に適した年間の飼育時期の設定。 2. 高温，過乾下における給与桑の萎凋防止法。	1. 桑の収穫体系に相応した飼育時期。 2. 給与桑の萎凋防止用資材の開発。 3. 簡易壮蚕飼育施設での防風対策。	1. 当地方の特性である高温，多湿，過乾が壮蚕の発育生理に及ぼす影響と安定した飼育技術。 2. 経営規模が大きい農家や，桑園が遠く桑運搬の困難な農家では，簡易壮蚕飼育施設を導入し，現場飼育を考える。
c－5. 上蔟技術と繭質改善	79～82	75%	○	次の上蔟改善技術を作出。 1. 条払いによる熟蚕の収集と竹蔟への振りこみ法。 2. 竹蔟の上下反転法による営繭分布の平均化。 3. 竹蔟の外側ひもかけ法による登蔟率と営繭率の向上。 4. 竹蔟による自然上蔟法。 5. 竹蔟の改善。 6. 適期収繭による不良繭の発生防止。	1. 繭糸質の改善。	1. 上蔟法と蔟中環境の改善。 2. 繭糸質の格付と検査法。 3. 繭糸質検査法の実技訓練。	1. 繭糸質検定法の施行。 2. 検定繭抽出者の任命。 3. 繭の格付による取引。 4. 繭価協定による統一基準価格の決定。 5. 大統領援助の4製糸工場での繭の等級差による生糸量の決定。
c－6. 蚕病の生態調査	78～80	90%	◎	1. 微粒子病の動向。 2. 蚕病の発生実態と被害実態。 3. ウイルス病の発生実態。 4. 病蚕の診断技術。	1. ウイルスによる蚕病の生態。	1. 新規養蚕地帯における蚕病の発生動向の解析。 2. 熱帯における蚕病生態の調査研究。	1. 蚕病発生報告組織の確立と強化。
c－7. 蚕病虫害防除	79～82	90%	◎	1. 微粒子病検査規制編集。 2. 主要蚕病コオジカビ病の防除剤の検索。 3. コオジカビ病防除に対する蚕室，蚕具，蚕体消毒法の組立。 4. コオジカビ病防除としての現地適応技術の確立。 5. ウイルス病防除，蚕蚕農家の集団防除。	1. 現地で入手し易い蚕体消毒剤の開発。	1. 蚕体消毒剤の検索。	1. 蚕体消毒剤の生産，配布組織の設置。
d－1. 蚕種製造法技術	78～82	85%	◎	1. 普通蚕種（2元，4元）の製造法。 2. 散種普通蚕種の製造法。	1. 蚕種の長距離輸送と貯蔵。 2. 散種生産方法の確立。	1. 輸送方法，輸送容器の対策。 2. 散種生産に適した棚，紙質の検討。	1. インドネシアにおける蚕種生産組織の確立。 2. 種繭生産分場農家の育成。

事業項目	実施計画年次	進捗状況	到達見通し	成果等の概況	残された問題点	その対策	将来への提言
d－2. 微粒子病検査技術	78～82	90%	◎	1. 微粒子病検査法。 2. 微粒子病予知検査法。 3. 微粒子病集団母蛾検査法。 4. 微粒子病抜き取り集団母蛾検査法。	1. 微粒子病検査規定の施行。 2. 近隣蚕蛾農家からの微粒子病菌の持ち込み防止。 3. 検査技術の向上。	1. 微粒子病検査規定の励行。	
d－3. 蚕種製造配布計画	80～82	70%	○	1. 年間製造計画。 2. 製造蚕種の配布計画。	1. 蚕蛾家の年間、時期別掃立量の把握。	1. 蚕種配布組織の整備。 2. 蚕種製造時期の調整。	
e－1. カウンターパートの訓練	78～82	70～85%	○	1. 基本技術の移転。 2. 開発試験の実施とレポート作成。 3. G.T. 訓練とテキストブックの編集。 4. P. ユニットの技術指導。 5. 桑園管理とA. カウンターパートの指導。 6. 日本研修派遣（6カ月）。	1. 技術開発能力の個人差。 2. 計画、指導能力。 3. 技術レポートの作成。 4. 各部門の協力協調。	1. 自覚と努力、海外研修。 2. 業務上の権限強化。 3. 文献、図書の充実。 4. 技術討論と意見交換。	1. 技術センターとしての評価。 2. 技術者による主導管理。 3. 海外との技術研究交流。 4. 技術開発の奨励。
① 栽桑							
② 蚕飼育				1. 試験計画の策定法、飼育技術の訓練による技術移転、試験結果の整理法および指導能力の向上をはかる。 2. 育蚕技術のテキストブック作成。	1. カウンターパートの技術開発能力	1. 当地方および当国の蚕蚕に役立つ、現場適用の試験の策定と新技術の開発能力の養成。	1. 試験研究はすべて成果が生産に直結せず無駄もあるが、試験研究用の予算に配慮を要する。
③ 病虫害防除				1. 試験計画の立案、試験方法等基本技術の移転。 2. 結果の取纏めと報告文の作成。 3. G.T. 訓練とテキストブックの編集。 4. 蚕桑病害虫防除法とA.カウンターパートの指導。 5. 日本研修派遣。	1. 技術開発能力の向上。 2. 試験、研究推進の積極性の向上。 3. 各部門との共同研究の推進。	1. 文献、図書の充実。 2. 業務の主体制の尊重。 3. 技術討論と意見交換。	1. 外国専門家の整備。 2. 研究推進奨励の推進。 3. 共同研究課題の設定。
④ 蚕種製造				1. 基本技術の移転。 2. 開発試験の実施レポート作成。 3. アシスタント、カウンターパートの指導。 4. 日本研修派遣（6カ月）。	1. 事業計画、指導能力の向上。	1. 業務上の権限強化。 2. 文献、図書の充実。	1. 技術者の管理運営参加。
e－2. 技術職員の訓練	78～82	70～85%	○	1. 桑栽培実技の修得。 2. 桑園一般管理の責任分担（作業員の指導と作業計画） 3. 開発試験の補助。	1. 技術修得の意欲が乏しい。 2. 実務の軽視または消極的傾向。 3. 家庭、私的行事優先思想。	1. 人事管理のあり方の再検討。 2. 採用方法の検討。	1. 地方との人事交流。 2. 技術開発の奨励。
① 栽桑							
② 蚕飼育				1. 育蚕実技の訓練。			
③ 病虫害防除				1. 蚕桑病害虫試験の実技の修得。 2. 作業計画と指導。 3. 開発試験の補助。	1. 技術修得に対する消極性。	1. 技術向上にかかわる討論会の設置。 2. 人事の交流。	1. 登用制度の改善。
④ 蚕種製造				1. 蚕種製造技術の修得。	1. 修得技術の練磨。		
f－1. 蚕蚕技術演示	80～81	80%	○	1. 技術演示第1次試案。 2. P.ユニット演示計画。	1. 演示計画の見なおし。 2. 問題点の摘出。	1. P.ユニット活動の継続と指導の強化。	1. 地帯別の技術体系作成。

事業項目	実施計画年次	進捗状況	到達見通し	成果等の概況	残された問題点	その対策	将来への提言
f－2. 蚕飼育演示技術の組立	80～81	80% (80%)	○	1. 開発された蚕飼育改善技術を組立て，パイロットユニットに適用。	1. 現場における問題点の摘出。	1. 素材を集積して演示技術を組立てる。	
f－3. 病虫害防除演示計画	80～81	80% (70%)	○	1. 実証試験を実施し演示。 2. G.T. の現地訓練。 3. 農民への実技訓練。	1. 演示計画の再検討。	1. P.ユニットにおける演示の推進。 2. P.ユニットの新規拡大。	
(副センター) a－1. 桑条技術	78～82	70%	△	1. 品種特調査(葉，枚)。 2. 桑の発育と収量(品種別)。 3. 多回育適応収穫体系。 4. ヤシヒの混植桑園内日照調査。	1. 家密の食害等によりデーター収集が困難。 2. 桑園一般管理。	1. サブセンターの環境改善。	
a－2. 桑病虫害防除法	78～82	70%	○	1. 主要害虫の現地適応技術の実証。 2. 主要桑病害については検討中。	1. 桑園管理の良否。	1. 桑園管理技術の徹底。	1. 病虫害に対応する栽桑体系の検討。
a－3. 蚕品種の現地適応試験	80～82	80%	○	1. 現地に適した四元交雑種の普及。			
a－4. 蚕病の生態と防除	78～82	80%	◎	1. 蚕室，蚕具消毒法を示した。	1. 病蚕に起因すると考えられる減蚕の把握。	1. 蚕室，蚕具消毒の徹底。 2. 発育不良蚕，へい死蚕の経時的診断対策。 3. 蚕病防除の重要性と認識の浸透。	
b－1. 現地桑条法の改善	78～82	－	e へ移行 (81～82)	1. 現地指導と演示桑園の造成。 2. M. alba の導入演示。	e に同じ。	e に同じ。	e に同じ。
b－2. 育蚕技術 ↓ e へ移行	78～82	－	－	1. ソッペン農民グループNo.3で，既設の稚蚕飼育所および農家の住宅高床下の蚕室を改善して稚蚕壮蚕技術を演示試行。		1. 今後はセンター，副センターで適応試験を実施してから，次にパイロットユニットで演示して，農民へ改善技術を波及する。	
b－3. 病虫害防除技術	79～80			1. 蚕室，蚕具，蚕体消毒法による繭増産桑園主要害虫防除の実施。	1. 消毒の普及。 2. 消毒剤の配布。	1. 消毒効果の認識の徹底。 2. 集団防除法の具体化。	1. 消毒剤費用の生産物請算方式の検討。
c－1. 普通蚕種の製造と蚕種の配布	78～82	70%	○	1. 大量の普通蚕種の製造と配布。	1. 散種生産方法の確立。 2. 蚕蛹，蚕沙，病蚕の処理施設。 3. 蚕種製造上の問題点探索。 4. 掃立箱当り蚕種製造量の増加。	1. 水洗，殺菌施設。 2. 堆積舎，焼却場の設置。 3. 蚕室，蚕具の消毒，消毒の継続的な励行。 4. 良桑の給与。 5. 技術職員による稚蚕飼育。	1. 飼育労働者の自家飼育の禁止。
c－2. 微粒子病検査	78～82	80%	○	1. 微粒子病検査法。 2. 微粒子病予防検査法。 3. 微粒子病集団母蛾検査法。 4. 微粒子病抜取検査法。	1. 微粒子病検査規定の施行。 2. 近隣蚕蚕農家からの微粒子病菌の持ち込み防止。	1. 微粒子病検査規定の励行。 2. 労働者の選択。	

事業項目	実施計画年次	進捗状況	到達見通し	成果等の概況	残された問題点	その対策	将来への提言
c－3. 桑さし穂の生産と配付	80～82	70%	○	1. M. alba 穂木口造成（センター，サブセンター50a） 2. 穂木生産と配付（約5万本分，81／82） 3. さし穂配付規定の作成。	1. シロカイガラの防除。 2. M. cathayana の穂木園造成。	1. カイガラの少ないセンターに移行。 2. Malino桑園に造成。	1. センターからの配付は穂木園用。 2. 農家には各地方普及所に穂木口設置。
d－1. 技術職員及び農民訓練の（桑条） ためのカウンターパート等の訓練（育蚕）	79～82	70～85%	○ ○	1. G.T. 及び農民訓練とテキストブック作成。 2. P.ユニット活動のためのG.T. 訓練 1. 蚕飼育実用試験でアシスタントカウンターパートを，農民訓練，パイロットユニット担当の普及職員の特別訓練に当り，カウンターパート等に実施計画と実技の指導をさせた。更にパイロットユニットの演示指導をさせている。	1. G.T. の技能向上。 2. 普及方法の改善。 1. センター技術者，農民訓練を軌道に乗せる。	1. 農業高校出身者の採用。 2. 普及員養成所の設置。	
（病虫害防除）			○	1. 基本技術の移転。	1. アシスタントカウンターパートの指導。	1. 指導力の養成。	
e－1. 桑条技術の演示指導 ① 桑条	80～82	65%	△	1. P.ユニット演示計画（5パイロットユニット）。 2. 稚蚕用桑園の設置と演示指導。 3. 演示農家の選定と演示指導。	1. 組織の充実強化。 2. 指立計画と桑収量予想。	1. 実務能力のある者をリーダーとする。 2. 稚蚕共同桑園設置義務付け。 3. 病害虫，共同防除体制。	1. 資材の共同導入，共販体制。 2. 農家の経営改善対策。 3. 農道整備と家畜対策。
② 育蚕				1. 蚕飼育演示技術を組立て，パイロットユニットの稚蚕飼育所，演示農家を指導。	1. 現場における問題点の摘出。	1. パイロットユニットで演示された改善技術を他のユニット，一般農家へ早急に波及させる。	1. 普及員の普及活動の促進。 2. 必要な資機材の備蓄と流通の円滑化。
e－2. 養蚕農家の実態調査 ① 桑条	80～82	75%	○	1. 農家実態調査（普及専門家）。 2. 演示農家の実態調査。 3. 技術，蚕柄検討会。	1. G.T. による経営調査と技術評価調査。	1. 調査票の配付。 2. 統計調査の強化。	1. 蚕糸統計の充実。
② 育蚕				1. パイロットユニットを中心に実態調査(普及専門家)。	1. 普及職員による経営調査。	1. 経営調査の継続実施。	1. モデル農家の経営資料作成と普及への利用。
e－3. 養蚕農家の技術評価 ① 桑条	80～82	65%	△	1. 技術評価試案の作成。 2. パイロットユニットにおける第1回評価の実施。	1. 技術評価調査方法の指導(G.T.へ)	1. 調査の継続実施。	1. 蚕糸統計の充実。
② 育蚕				1. パイロットユニットで技術評価。	1. 普及職員による技術評価の実施。	1. 技術評価の継続実施。	1. 資料の普及への活用。

インドネシア養蚕技術開発5ケ年計画

SERICULTURAL TECHNOLOGY DEVELOPMENT PROGRAMMES in INDONESIA (1984/1985 - 1988/1989)

I. BACK-GROUND

1. Sericulture has long been known in Indonesia, but was not put into rather large scale business until the beginning of 1960's. The highest production was reached in 1971/1972 amounting to 140 tons. In 1973 there broke out a pebrine disease and in 1974 the government announced prohibition to the public for multilying silk worm eggs by themself. For the subsitution the farmers had to use imported eggs from Japan. Since then there happens a very drastic dicrease of production.

2. To overcome the supply of eggs in addition to import, in 1975 the government established 3 egg production units, i.e. 2 units in South Sulawesi (Soppeng and Enrekang) and 1 unit in Central Java (Candiroto). Eggs produced by those units are F_2 hybrid originating from ex-import F_1 hybrid from Japan. These efforts has not come to dissolve the problems, due to the poor quality of produced eggs.

3. A central for sericultural technology development was established in 1978 through the cooperative project with the Japanese Government. This central, supported by 1 sub-centre and 5 pilot-units, all are in South Sulawesi. The technology being developed covers :
   - egg production
   - mulberry plantation
   - silkworm rearing
   - pest and desease controle.

4. The activities of this project have brought the development of sericulture in Indonesia to a more favourable prospect, among others :
   - in 1980 starts producing F_1 hybrid.
   - the possession of trained university graduate and semi-graduate personnel in the field of sericulture.
   - the possession of buildings and equipments required for further technological development, especially those in concern with the 4 fields mentioned above.
   - the discovery of some basic applied technology for further development.
   - the recovery of public enthusiasm in dealing with sericulture.

5. The production of sericulture in Indonesia shows an increasing tendency and so does the demand which can be recognized from the increasing import figures. This tendency is shown as in table 1.

Tabel 1 : The production and import of silk thread in Indonesia (1977 - 1981) in ton.

Years	PRODUCTION (Raw Silk)	Import		
		Raw Silk	Spun Silk	Total
1	2	3	4	5
1977	35,9	10,7	62,1	72,8
1978	39,2	11,1	98,5	109,6
1979	41,9	8,9	139,2	148,1
1980	47,0	11,6	312,6	324,2
1981	55,5	33,3	426,7	460,0

6. Regarding the current development and the tendency to come, the main problem to put into consideration is to promote raw silk production both in quantity and quality, in line with keeping the public enthusiasm.

7. Some efforts have to be taken in order to overcome this main problem, such as technological improvement and promotion, egg production management, farm management and providing fasilities for the public concerned.

II. GENERAL PROGRAMME in PELITA IV

A. P O L I C Y

In improving and promoting the sericulture in Pelita IV (the 4th Five Years Plan), such general policy should be taken into account as :

1. To increase the people income and welfare widely and evenly.
2. To provide as much employment as possible.
3. To save foreign currency through the use of domestic product instead of import.

B. O B J E C T I V E S

The objectives to be obtained in sericulture in PELITA IV based on the above mentioned general policy are :

1. To promote the public enthusiasm in sericulture through increase of income and improvement of welfare.
2. To improve and promote sericultural technology to provide as much employment as possible without disregarding the efficiency.
3. To improve the quality of silk thread in order to match the current demand presently supplied by imported product.

C. T A R G E T S

The data here under show the principal target of raw silk, which have to be achieved gradually in PELITA IV.

Year	Production
1984/1985	100 ton
1985/1986	125 ton
1986/1987	175 ton
1987/1988	250 ton
1988/1989	350 ton

Various supporting facilities should also be provided as shown in the enclosure. Improvement on managerial aspect and promotion of providing facilities to the public should also be performed.

III. TECHNOLOGICAL PROGRAMME

A. PROBLEMS ENCOUNTER

Achieving the targets and objectives based on the policy mentioned in Chapter II, there are problems to be encountered in the field of technological, such as :

1. Shortage of qualified personnel to manage the technological improvement which stand to be in higher demand.

2. Lack of knowledge in egg production management, this problem, in the mean time, turns to be a strategic one fore the development of sericulture in Indonesia.

3. Lack of qualified personnel in breeding technology both for mulberry and silkworm which are very important in discovering best quality species corresponding to various conditions in Indonesia.

4. Poor quality of cocoon and raw silk to take place of imported silk thread currently demanded by the consumers.

5. Very slow transfer process of technology to the farmers, due to the inefficiency of the current extension system.

B. PROBLEMS SOLVING

The efforts needed to solve the problems mentioned above are :

1. Scholarship for post-graduate study for at least 5 best personnels. Prior to the availability of these, the assistance of foreign experts to manage the technological development activities are still needed.

2. Training the Indonesian personnel in egg production management by foreign experts.

3. Education and training for Indonesian personnel both oversease and domestic in breeding technology for silkworm as well as mulberry.

4. With the assistance of foreign experts, introducing and developing reeling and spinning technology appropriate with the Indonesian condition.

5. Developing of extension system and technique, equiped with facilities in accordance with Indonesian farmers condition. The knowledge of sericulture farm management is highly essential in the system. Expert assistancies and facilities from developed countries are required in this case.

6. Separating the egg production activities from those of technological development and extension as a certain unit for the achievement of efficiency in its management. This egg production unit is intended to be under the management of a state enterprise.

7. Setting a National Sericulture Promotion Programme based on a thorough study.

Enclosure

PROJECTION OF SERICULTURE DEVELOPMENT ACTIVITIES in PELITA IV

No.	Activities	Units	Years					Note
			I	II	III	IV	V	
1	2	3	4	5	6	7	8	9
1.	Technological Development *) :							*) Cummulative
	a. Central	Location	1	1	1	1	1	
	b. Sub-Central	Location	2	2	2	2	2	
2.	Egg Supply	1000 boxes	30	40	60	80	120	
3.	Establishment of Mulberry Orchard	1000 ha	10	13	18	25	35	
4.	Establishment of Spinning Machine	Unit	10	13	20	26	40	

インドネシア養蚕開発計画に対する南スラウェシ州知事の声明文（英訳）

ADDRESS BY THE GOVERNOR OF SOUTH SULAWESI
AT THE RECEPTION FOR THE JAPANESE EVALUATION TEAM
AT THE SOUTH SULAWESI SERICULTURE DEVELOPMENT PROJECT
(ATA-72) in UJUNG PANDANG ON SEPTEMBER 24, 1982.

Honorable Leader and members of the Japanese Evaluation Team in the context of the ATA-72 Project for South Sulawesi Sericulture Development,

Dear audience,

First of all, please allow me to welcome all of you and thank you for visiting South Sulawesi in the context of the ATA-72 .

We have the greatest pleasure in receiving your visit, as it will bring benefit to this region, particularly for its sericultural development.

Next, allow me to present briefly the following account of the South Sulawesian sericulture.

1. Introduction

Sericulture in South Sulawesi has developed long ago, particularly for farmers in the rural regions. The activities include mulberry cultivation, silkworm rearing, and weaving. These are developable because most of the South Sulawesian people live on agriculture, and traditional weaving has been customary to most farmer women.

Progress in silk thread production in South Sulawesi was achieved in 1971 to the amount of 138 tons, thus 95.8% of the national production which amounted to 144 tons.

As result of the pebrine disease and the imperfect technology in silkworm rearing, production declined to as little as 25 tons in 1973.

The decline had great effect on the lives of rural farmers, in view of the fact that sericulture has yielded quite a good income to their households.

The cooperation between the Governments of Japan and Indonesia has brought about quite a good output, as South Sulawesi becomes able to produce silkworm breed and silk thread according to advanced tecnnology. The latter ought to be developed further in the effort of enhancing development and upleveling farmers' income.

In order to enhance sericultural processing, President Soeharto in 1976/1977 extended an aid in the form of one rearing unit in kabupaten Soppeng, two weaving units respectively located at Tajuncu in kabupaten Soppeng and at Sudu of kabupaten Enrekang. In 1977/1978 further aid was extended, namely one rearing unit at Sudu of kabupaten Enrekang and two weaving units respectively in the kabupaten-s of Wajo and Sidrap.

2. Prospect of Sericulture in the future

Farmers engaged in active sericulture enterprise in South Sulawesi are recorded to number about 5200 households, at mulberry planting areas extending approximately 5500 ha. The number of farmers and the extent of the area can still be increased to 15,000 ha., this enterprise being a preference to the community, being able to yield extra income, and being a home industry in the rurals.

This is quite a great potential for sericultural development in Indonesia.

With the supply of breed from the Sericultural Project, sericultural business has a bright prospect, in upleveling farmers' income in particular and in supporting South Sulawesian regional development in general.

Sericultural development may be attained when all parties can offer optimal attention and participation, especially in transmitting the advanced technology.

In this connection, the Japanese Government's aid to the South Sulawesian people in the utilization of advanced technology in sericulture has been enjoyed. Hence allow me on behalf of the Regional Administration and the people of South Sulawesi to express invaluable gratitude to the Japanese Government through this Team for all the assistance given us.

Your aid is still expected, particularly for the solution of various problems in sericulture, such as mentioned next.

3. Problematics

Problems encountered by sericultural farmers in South Sulawesi at present are:

a. Provision of capital and equipment for their home industry. It is one of the factors to facilitate the use of technology and the enhancement of silk thread production.

b. Upleveling of the information system in accordance with the farmers' condition and education.

c. Increase in the number of reeling machines in order to keep up with the increasing cocoon production and the quality of silk produced.

d. Introduction of better Home Industry Units for sericulture in the aspect of production.

Those are thus the expectations of the South Sulawesian people. We hope that after the termination of this agreement, the Japan-Indonesian cooperation may be proceeded, so the results gained may be more beneficial to development and to the upleveling of community welfare.

Thank you.

Governor of
South Sulawesi,

A. O D D A N G.