

**COLLABORATIVE RUBBER RESEARCH
ACTIVITIES BETWEEN
INDONESIAN RUBBER RESEARCH INSTITUTE
AND CIRAD - CP
FOR THE PERIOD OF 1994 - 1996**

INDONESIAN PLANTERS' ASSOCIATION FOR RESEARCH AND DEVELOPMENT
(IPARD)

Collectivities: → **INDONESIAN RUBBER RESEARCH INSTITUTE
(IRRI)**

February 1994

→ **CIRAD - CP**

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PREFACE

Meeting on collaborative rubber research activities was held at Indonesian Rubber Research Institute (IRRI) office at Sungei Putih, North Sumatra on 21 - 23 February 1994.

Objectives of the meeting were :

- (1) To report the collaborative activities between Indonesian Rubber Research Institute and CIRAD-CP.
- (2) To propose the collaborative activities for 1994-1996.
- (3) To discuss and conclude the collaborative activities for 1994-1996.

The meeting was also attended by Dr.Ir. Soepadyo Mangoensoekardjo and Dr.Ir. Sukarya Danimihardja from IPARD and by Indonesian Rubber Research Institute's directors and staffs.

The conclusion of the meeting is that CIRAD-CP agrees to have 6 collaborative activities with Indonesian Rubber Research Institute for 1994-1996.

It is hoped that the collaborative activities between the two institutes will be successfull and give benefit to both sides.

23 February 1994

INDONESIAN RUBBER RESEARCH INSTITUTE

Sungei Putih, North Sumatra



Dr. Ir. Basuki

Director

I. RESULTS OF THE PAST COOPERATION AND PROPOSAL FROM
INDONESIAN RUBBER RESEARCH INSTITUTE
FOR THE PERIOD OF 1994-1996

1.1. Introduction

Research collaboration between Indonesian Rubber Research Institute and CIRAD-CP has been conducted since 1986. The collaboration was commenced with the joint activities done by the researchers of Sembawa Research Institute for Estate Crops (Palembang, South Sumatra), now is one of units of Indonesian Rubber Research Institute, and some researchers of IRCA/CIRAD-CP. The scope of collaboration covers cultivation techniques, socio-economic aspect of rubber growers and processing technology.

Through this scheme, four staffs of Sembawa Research Institute were sent to study in France, three of them were for doctorate programme until the end of 1993. Two have succeeded in their study and have come home to Indonesia.

Besides, the collaboration gave also benefit of information on the potential use and development of superior plant material in South Sumatra, Jambi, Bengkulu and South Kalimantan. Electrophoresis latex technology to purify the rubber clones in budwood gardens was introduced by IRCA to some breeding researchers in Sembawa and Sungei Putih (North Sumatra).

The proposal "Multilocation trials for rubber clone recommendation in various agroclimatic conditions of Indonesia" has been compiled and is now waiting for its implementation.

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1.2. Collaborative Activities for the Period of 1989-1993

1.2.1. Joint research activities on rubber processing technology

(Res.Prop.No. 2.11.01.01)

The aim of this collaboration was to reinforce the research activities on rubber processing technology in terms of improving the quality of smallholder rubber.

Mr. S. Palu, a rubber technologist, not only worked on his own research but also helped arrange post harvest research programme which was to be in Pilot Plant Crumb Rubber Factory in Sembawa Research Station. Besides, he acts as a consultant in TCP (Tree Crops Processing Project)/TK PIR (Nucleus Estate Scheme) for the establishment of Pilot Plant CRF-in Sembawa. His term of office as a consultant expires in June 1994.

1.2.2. Joint research activities in socio-economic aspect

(Doc Nos. 9102-9103-9104)

The socio-economic of rubber smallholders was also an object of the collaboration, the research of which should be intensified. Miss Anne Goujone has worked with the socio-economists of Sembawa Research Institute in identifying the problems and potentialities of resources met in rubber smallholdings. She finished her work in Sembawa in mid 1991.

Collaborating with Gapkindo (Rubber Association of Indonesia), a socio-economic team of Sembawa Research Institute and IRCA has carried out a survey on the potential supply of superior plant material for regions covering South Sumatra, Jambi, Riau, Bengkulu and South Kalimantan.

1.2.3. Joint research activities on agroclimatology

(Res.Prop.No. 07.24.001)

Another purpose of the joint research activities was to arrange agroclimatic data and map of rubber areas. Further, based on this agroclimatic data & map, a multilocation trial for rubber clones would be planned, connected with clone recommendations conforming to the local agroclimatic conditions. Afterwards, based on the agroclimatic map and the results of the multilocation trial obtained so far, more specific recommendations have been compiled for rubber clones in certain areas.

Mr. E. Penot, working in Sembawa since May 1993, with a team of Indonesian Rubber Research Institute is now arranging a research project proposal on multilocation trial in various agroclimatic conditions of Indonesia. The proposal is entitled : "Multilocation Trials for Rubber Clone Recommendations in Various Agroclimatic Conditions of Indonesia".

1.2.4. Latex electrophoresis

The electrophoretic latex technology was introduced as a technique for identifying and purifying rubber clones by observing protein ribbons resulted from the electrophoresis. It is known that each clone has a certain protein map which is different from the other's.

One of research staffs was entrusted by IRCA/CIRAD to introduce this technique to two researchers of Indonesian Rubber Research Institute and to train them in a system called "learning by doing".

1.2.5. Study of Hevea-based Intercropping System Functioning

(Res.Prop.No. 2.01.04.03.03)

Justification

Intercropping systems are not new area for agricultural research institutions. Pioneering by food crops research institutes, this system becomes an important object for tree crop sector, especially Hevea. This is logic, because the systems are based on traditional system which practiced by farmers is not only in Indonesia, but also by most of all agrarian countries in Asia and Africa.

Based on previous studies in intercropping system, it is necessary to study deeply how the mechanism inter and intra plants in the system is. To find this information, European Economics Community (EEC) sponsor this project. The project will be conducted in Hevea-based intercropping systems by several countries (France, Germany, Indonesia, Ivory Coast and Gabon).

The project which will be carried out in Indonesia relates with previous studies and it will support to increase the productivity and farmers' income.

Objectives

To know the competition mechanism between Hevea and intercrops, by understanding the mechanism we can recommend which cropping system is suitable for small-holder rubber condition.

The programme has scope activities as :

- study of agro-physiology of cropping components in the systems. It will be conducted at Research Station.

- study of growth variability of cropping system components in the systems. It will be conducted at farm level (on-farm trial).

Output of the project will be quantitative information of interaction between components in this systems. This information will be used to choose suitable cropping systems for the farmer's, based on the principle of extrapolation.

Institutional Framework

The project responsibility from Indonesian Government would be The Ministry of Agriculture, Agency for Agricultural Research and Development (AARD). Implementing agency would be Research Institute for Estate Crops (RIEC) Sembawa, coordinating with Indonesian Planter's Association for Research and Development (IPARD).

The Project responsibility from France Government would be IRCA, CIRAD.

Funding

This research will be funded by EEC through France Government (IRCA/CIRAD) as a grant.

This fund includes :

- budget for visiting of cropping system research from IRCA before and long project implementation (two weeks for each)
- purchasing one of 4 wheels drive vehicle
- purchasing research instruments

External funding ECU 80,260 (1ECU = \pm Rp.2.700,-)

1.3. The Proposal for collaborative Research Activities for the Period of 1994-1996

1.3.1. Pre Harvest

1.3.1.1. Study of Hevea-based Intercropping System Functioning

This project being continuation of the same project above (1.2.5.) which has been started in 1993 and will cover 4 years periode (1993-1996).

1.3.1.2. Multilocation Trials for Rubber Clone Recommendations in Various Agroclimatic Conditions of Indonesia

The activities are :

- (1) To arrange an agroclimatic map of rubber cultivati-on centres, which is to be the basis of clone recommendations according to certain agroclimatic conditions.
- (2) To compile a project proposal for the multilocation trials, and to gain good funding from domestic and foreign sources.
- (3) The implementation of the project above-mentioned for the trials to come into operation.

Discriminative clone recommendations are expected to be the result of this collaboration.

Budget proposed is U\$ 2.5 millions for five years' period

1.3.1.3. Latex electrophoresis (Second mission)

Mastering the method of latex electrophoresis by the breeding staffs of Indonesian Rubber Research Institute is the objective of this mission.

For that, a researcher or technician of CIRAD-CP, skilled in this method, is expected to come and stay in the Indonesian Rubber Research Institute for 1 - 3 months, bringing with him the equipment and materials needed. Of the Indonesian Rubber Research Institute, two or three research staffs will be appointed as trainees for this electrophoretic latex technology. It is also considered necessary to send one or two research staffs of Indonesian Rubber Research Institute to Montpellier for 2 - 3 weeks on the job training to familiarize the modern laboratory equipments.

The commercialization possibility of this electrophoretic latex technology as a means of purifying rubber clones to rubber estates in Indonesia should be considered further.

The Indonesian Rubber Research Institute will provide accomodation and transportation facilities for the CIRAD-CP staffs during their stay in Indonesia. The French Government is expected to provide the two-way tickets needed for the Indonesian researchers who are going to Montpellier.

1.3.1.4. Latex diagnosis

Latex diagnosis, another objective of this collaboration is to improve the knowledge and skill of rubber exploitation researchers of the Indonesian Rubber Research Institute in analyzing latex. The use of latex analysis is to diagnose the physiology of rubber tree, particularly in conection with the exploitation system.

Latex diagnosis is accepted as a suitable method to determine the best exploitation system since it includes the physiological aspect of the rubber tree.

For that purpose, an expert in latex analysis with its interpretation from CIRAD-CP would hopefully be appointed in Indonesia for one or two years. As counterparts, the Indonesian Rubber Research Institute will provide one or two staffs who have background of latex physiology and general plant physiology.

Accommodation facilities, transportation for field operational activities and the cost of latex analysis will be the responsibility of the Indonesian Rubber Research Institute. On the other hand, living costs and allowances for the researchers of CIRAD-CP posted in Indonesia are expected to be that of The French Government or of other foreign sources.

1.3.1.5. Rubber clones exchange

The objective of rubber clone exchange is to take full advantage of rubber clones exchanged, in terms of their productivity and secondary characteristics (disease resistance, fast growth, etc.). Which and how many clones to exchange depend on their performances and the agreement made by the participating rubber research institutes. Therefore, the breeding researchers need to visit each other's country to study the clones' field performance.

1.3.2. Post Harvest

Development of Rubber Products through Improvement of Research and Development Facilities

The Indonesian Government has put an emphasis on the development of industrial products, including the rubber products, in order to strengthen, technically and economically, the position of the non-oil sectors, due to the diminishing role of oil as the main foreign exchange income.

At present, most of the rubber product industries in Indonesia do not have an "in house" research and development facilities. Therefore the Bogor Research Station for Rubber Technology, as the only research institute engaged in research and development on rubber compounding, processing and testing, is expected to play a vital role in assisting the rubber product industries in order to enable them to produce good quality rubber products, both for import substitutes and for export purposes.

The research staffs of the institute especially the junior staffs, still require additional knowledge on rubber technology and skill in rubber compounding, processing and testing. Furthermore, many of the existing rubber processing machines and testing equipment are quite old and some are obsolete.

The objectives of the collaboration are as follows :

- (1) To enhance the capability and skills of the research staffs at Bogor Research Station for Rubber Technology in manufacturing techniques of good quality rubber

products for domestic use, import substitutes, and export purpose.

- (2) To do joint research to overcome some problems such as carcinogenic effects of nitrosamine and protein allergen in latex product, and to develop the method producing low protein concentrated latex for increasing demand of consumers in the near future.
- (3) To better equip the pilot plant and physical testing laboratory, with the necessary processing machineries and testing equipment for research and development purposes.
- (4) To provide assistance to the rubber product industries in producing good quality rubber products.

The total budget for this post harvest project is :

U\$ 2,635,000.00

II. CONCLUSION OF THE JOINT MEETING ON COLLABORATIVE RUBBER RESEARCH ACTIVITIES FOR THE PERIOD OF 1994-1996

2.1. Pre Harvest

For pre harvest, the meeting concluded that the collaborative research activities between Indonesian Rubber Research Institute and CIRAD-CP are as follows :

- (1) Study of hevea-based intercropping system functioning.
- (2) Multilocation trials for rubber clone recommendation in various agro-climatic conditions of Indonesia.
- (3) Adapting the latex diagnosis technique for rubber.
- (4) Electrophoresis technique for budwood gardens.
- (5) Rubber clones exchange
- (6) Study of rubber diseases

Detail of these pre harvest research activities is given below :

2.1.1. Study of Hevea-based intercropping system functioning

This activity already started in 1993 and is already going well. Since this programme will finish in 1996, it is very important to think to continue the programme until mature period of the rubber trees. Indonesian Rubber Research Institute and CIRAD-CP should start to write a proposal to continue this project and send it to EEC or other funding agencies.

In this trial, it is also suggested to test rice variety which is tolerant to shade.

2.1.2. Multilocation trials for rubber clone recommendation in various agro-climatic conditions in Indonesia

This proposal needs budget for about US\$ 2.5 millions for 1994-1998. The source of budget is still not fixed yet. Indonesian Rubber Research Institute will try to send the proposal to BAPPENAS to be included in a Blue Book. For preliminary trials, Indonesian Rubber Research Institute will have budget from AARD for only about Rp.40 millions started April 1994. This budget is supplied directly to Sembawa Research Station.

Mr. Eric Penot is a CIRAD-CP expert who has already worked at Sembawa Research Station. His job was especially to help Indonesian Rubber Research Institute to elaborate the project of multilocation trials for rubber clone recommendation and in doing mapping the soil and climate suitable for rubber in Indonesia. This work started in 1993 and should be finished by the end of 1994. The map will be used in the multilocation trials. Mr. Eric Penot will work for Indonesian Rubber Research Institute until the end of 1994.

2.1.3. Adapting the latex diagnosis technique

CIRAD-CP propose to assign a research officer to transfer and adapt latex diagnosis to the PTP conditions. As it is a transfer of technology, this activity should be paid by PTP. CIRAD-CP will submit a proposal for this joint activity before the end of April 1994. The period of collaborative activity is at least for 3 years from 1995.

2.1.4. Electrophoresis technique for budwood gardens

The proposal of CIRAD-CP is the following :

- a) a short mission of a CIRAD-CP expert (3 weeks) to make a survey upon the budwood gardens used for the multilocation trials. For this mission, supposed to occur in the second half of 1994, CIRAD-CP will submit a proposal before the end of April 1994. All the budget needed for this activity will be paid by Indonesian Rubber Research Institute and IPARD.
- b) the transfer of technology will be part of the activities of the CIRAD-CP expert mentioned above for the latex diagnosis technique.

2.1.5. Rubber clones exchange

The first step in this collaborative activity is the exchange visit between Indonesian Rubber Research Institute's breeders and IDEFOR's breeders of Cote d'Ivoire. The second step is the rubber clone exchange itself. Dr. Rasidin as Indonesian Rubber Research Institute's breeder is planned to visit Cote d'Ivoire for two weeks at the end of 1994. The air tickets are expected to be paid by the French Embassy. CIRAD-CP will arrange within this trip a short visit to Montpellier. The exchange of clones itself will be on share cost base.

2.1.6. Study of rubber diseases

During the discussion on pre-harvest activities, CIRAD-CP suggested Indonesian Rubber Research Institute to send Indonesian Rubber Research Institute's pathologist to French Guyana to study SALB there for a short period. CIRAD-CP will send a proposal for this visit.

CIRAD-CP agrees to send a plant pathologist to Indonesian Rubber Research Institute for one week to evaluate rubber diseases in Indonesia jointly with Indonesian Rubber Research Institute pathologists as a preliminary step to further research collaboration in pathology in the future.

2.2. Post Harvest

For post harvest activities, results of discussions are summarised as follows :

- 1) CIRAD is not in a good position to help to find source of finance for the down stream technology project as they deal mainly with upstream activities.
- 2) CIRAD, however, has a good link with French Rubber Industries and they will put forward such proposal to such industries. Similar collaboration had been done before with the Government of Thailand through UNIDO.
- 3) Bogor Research Station for Rubber Technology has a very strong link with rubber goods industries. They come to the research station not only to test their samples but also to get some advices for developing new rubber products, i.e. the existence of the research station is vital for such industries. Dr. P. Rondot is invited to visit the research station shortly.
- 4) Mr. S. Palu will stay at Sembawa Research Station until September 1994 but preferably if it is possible his stay can be extended until April 1995

5) Dr. de Livonniere will come to Bogor Research Station on October 1994 while attending the UNIDO earth quake seminar which will be held by Indonesian Rubber Research Institute and IPARD in Jakarta.

In conclusion, the technical assistance is extremely required by Bogor Research Station for Rubber Technology to speed up the development of rubber goods industries in Indonesia. CIRAD-CP proposes to do its best to help this project.

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