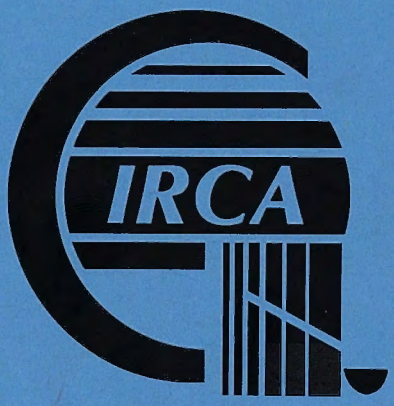
MISSION REPORT IN THE PHILIPPINES

from October 8th to 16th 1991
and October 26th to November 4th 1991

H. de Livonnière - J.C. Touron



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CONTENTS

SOMMAIRE ET CONCLUSION

Ces deux missions se situent dans la perspective d'une mise en place de l'opération d'assistance technique, demandée à la France par le Gouvernement des Philippines, dans le domaine du caoutchouc naturel.

Cette opération se fera au PICRI sur le campus de l'Université du Sud de Mindanao. Son financement d'origine française a pu être obtenu grâce à l'intervention de l'attaché commercial auprès de l'Ambassade de France. L'opération comportera deux volets :

- amélioration de la qualité du caoutchouc produit par les Philippines,
- agronomie.

L'amélioration de la qualité du caoutchouc des Philippines passe par la mise en place d'un laboratoire de contrôle susceptible d'effectuer des analyses de caoutchouc brut, en conformité avec la norme ISO 2000 ainsi que d'autres mesures : consistance Mooney et caractéristiques de vulcanisation. Le laboratoire sera installé sur des bâtiments identifiés à l'occasion d'une précédente mission effectuée par M. Roudeix, IRCA, en Mai 1991.

Ces deux missions ont permis de dresser un état des lieux, de rencontrer un certain nombre de partenaires intéressés par le développement de l'hévéaculture à Manille comme dans l'île de Mindanao, et de travailler sur l'aménagement du bâtiment d'accueil du laboratoire ainsi que de la maison destinée aux experts IRCA.

La partie agronomique se situera au niveau de l'amélioration des rendements chez les petits planteurs. Les objectifs et le programme seront définis à l'occasion d'une mission qui devra avoir lieu dans le courant de l'année 1993.

Le projet aura une durée de deux ans, partagée entre 6 mois d'expert technologue et 18 mois d'expert agronome.

Les rapports des auteurs ont été rédigés sur place avec les partenaires philippins : Mrs Del Rozario et Mrs Bougarine et présentés en fin de mission aux autorités de tutelle françaises et philippines.

Après cette page de sommaire, le lecteur trouvera une page d'introduction rédigée par l'USM à l'occasion des réunions IRRDB de Décembre 1991 sur l'hévéaculture aux Philippines ainsi qu'une carte situant les différentes zones hévéicoles, puis les rapports en anglais de : H. de Livonnière présenté au DOST le 15 Octobre 1991 et J.C. Touron, présenté le 30 Octobre 1991 à l'USM.

En conclusion de ces missions, le programme de 1992 comprendra :

- aménagement du laboratoire : PICRI-USM avec assistance IRCA
- aménagement du logement des experts : PICRI-USM
- commande des équipements IRCA, DOST, PICRI, USM, PCARRD
- acheminement du matériel entre Juin et Septembre 1992

- installation : début en Octobre 1992.

Deux missions de M. Touron, expert technologue, sont programmées en Février et Octobre 1992. Une mission en agronomie se fera à une date à déterminer. A la suite de cette mission, sera désigné l'expert agronome qui succèdera en Février 1993 à l'expert technologue.

Le contrat correspondant à ce projet a été préparé au cours des missions et sera signé une fois connus avec précision la liste et le coût des équipements.

STATUS OF THE PHILIPPINE NATURAL RUBBER INDUSTRY

Rubber (Hevea brasiliensis Muel. Arg.) was introduced into the Philippines in 1906. To date, about 80,000 hectares of more than one million hectares of land with potential for rubber production is planted and about 75% of which is productive. Plantations are concentrated mainly in Mindanao, the only part of the country where the soil and climate are suited for rubber growing. Rubber manufacturers, however, are mostly based in Metro Manila.

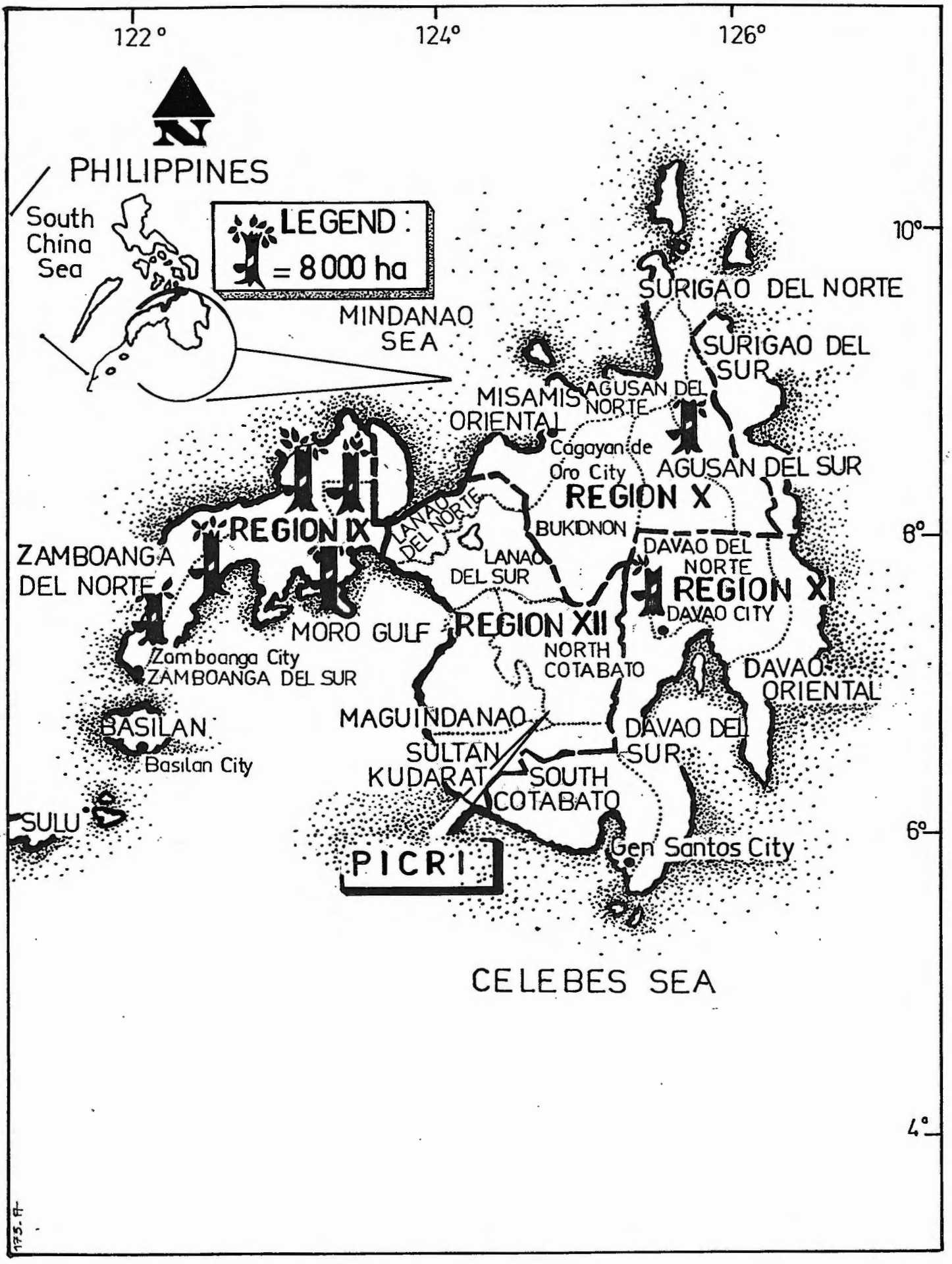
The national average production per hectare is estimated at 1.2 metric tons dry rubber annually and the bulk of the local production is used domestically. About 13,000,000 NK of natural rubber latex, natural rubber and similar natural gums were exported in 1989.

There are big and small rubber plantations in the Philippines. The big plantations are predominantly engaged in integrated operation, that is, production - processing - marketing. By and large, the smallholders are merely producers of raw rubber products. Cover cropping is used in big estates, while in small rubber holdings, short-term crops are planted between the rows of young unproductive rubber trees.

Past and present R&D efforts have been devoted primarily on adaptive research and verification of technologies developed from advanced rubber-producing countries. While similar efforts along this line will still be pursued in the future, greater emphasis will be focused on the generation of appropriate income-enhancing technologies, particularly crop improvement, processing, and manufacture of industrial products coupled with an aggressive manpower development program and improvement of facilities. With the membership of the Philippines to the International Rubber Research and Development Board (IRRDB), these objectives can be achieved in the near future.

Complementing the R&D thrust and to hasten the expansion of the area planted to rubber, the government, through the Land Bank of the Philippines (LBP), extends production loans to farmers' cooperatives and associations. Likewise, to upgrade the quality of natural rubber primary processed products, the country intends to put up a quality control laboratory at the University of Southern Mindanao (USM). The recent French mission assured the Philippines of its assistance to this project.

Another boost to the industry is the organization of the Philippine Rubber Industry Association (PRIA), which covers the cross-section of the industry: the producers, processors, and manufacturers of industrial rubber products. Likewise, government agencies, namely, Department of Agriculture-Bureau of Agricultural Research (DA-BAR), Department of Science and Technology (DOST), Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Department of Trade and Industry-Bureau of Product Standards (DTI-BPS), and the USM, have coordinated their efforts with PRIA and ushered the acceptance recently of the Philippines as a new member to the Association of Natural Rubber Producing Countries (ANRPC). This membership to the association will promote Philippine rubber in the world market.


122°
124°
126°
PHILIPPINES
South China Sea
LEGEND :
= 8 000 ha
MINDANAO SEA
SURIGAO DEL NORTE
SURIGAO DEL SUR
MISAMIS ORIENTAL
AGUSAN DEL NORTE
Cagayan de Oro City
AGUSAN DEL SUR
REGION X
REGION IX
LANAO DEL NORTE
BUKIDNON
DAVAO DEL NORTE
ZAMBOANGA DEL NORTE
LANAO DEL SUR
REGION XI
DAVAO CITY
REGION XII
MORO GULF
NORTH COTABATO
Zamboanga City
ZAMBOANGA DEL SUR
DAVAO ORIENTAL
MAGUINDANAO
DAVAO DEL SUR
BASILAN
Basilan City
SULTAN KUDARAT
SOUTH COTABATO
SULU
Gen Santos City
PICRI
CELEBES SEA
10°
8°
6°
4°

ACKNOWLEDGEMENTS

The authors would like to thank particularly :

- S.E. The Ambassador, J. Gaussot

- Mrs C. Castagnet-Melchior, Commercial Counsellor at the French Embassy

- Mrs B. Del Rosario, PCARRD

- Dr Gloria, undersecretary DOST

- Dr Kundo E. Pahm, Rector of USM

- Dr Rosemarie B. Bugarin, Dean of the Arts and Sciences College

- Dr Angelina Bautista

- Dr Eugenio Alcala

MISSION REPORT IN THE PHILIPPINES

H. de Livonnière

from October 8th to 16th 1991

MISSION SCHEDULE
(8 October - 16 October 1991)

8 October (Tuesday)	- Arrival
9 October (Wednesday)	- Visit to the French embassy where we met Mr G. Maurillon and Mme Melchior. - Meeting at DOST with : Secretary Ceferino L. Follosco (DOST) Undersecretary R. T. Gloria (DOST) Dr. B. P. del Rosario (PCARRD) Dr. C. R. Escaño (PCARRD) Mr. G. Benard (IRHO-CIRAD) Mme. C. Melchior (French Embassy, Commercial Section) Mr. G. Maurillon (French Embassy, Scientific & Cultural Section) Ms. J. Eusebio (PCARRD) Ms. M. Sisteberio (PCARRD) - lunch hosted by DOST - Meeting with Mr. E. Ching (PRIA) - Cocktail hosted by Mme. C. Mechior
10 October (Thursday)	- leave for USM via Cotabato (by air), where we were picked up by Dr. E. Alcala (USM) - dinner hosted by USM officials - stay at USM guesthouse
11 October (Friday)	- visit to and discussion with financing institutions (Land Bank, Ms. F. Macanas; Development Bank-Mr. Bambeo) - visit to Makilala Rubber Growers Integrated Cooperative, Inc. (MARGICO) and discussion with Mr. Glicerio Hilario, Jr. - visit Rubber Quality Testing Laboratory, USM (renovation of existing building by Engr. B. Fortinez - on-going - discussion with Dr. R. Bugarin's group. - stay at USM guesthouse
12 October (Saturday)	- visit to smallholders, medium holders and tappers at Carmen, Cotabato - discussion with Mayor R. Taleño, Carmen, Cotabato - visit of the proposed PICRI site - visit of BERCO machine shop, Kidapawan (Manager: A. Bernardo) - visit of Cabacungan Processing Plant, Makilala (owner : Mr. H. Cabacungan), hydro powered and uses rice hulls as energy for drying - visit of Malasila, Makilala Cooperative Industries (MMCI), small producers of gaskets and other rubber products

	- visit of Malasila Marketing Cooperative, Makilala (hydro powered; uses rice hulls as energy for drying) - visit of a rubber wood sawmill (owner : A. Cagape) - visit of USM rubber experiment - lunch hosted by Mr. A. Balagot (Le Reve) - dinner hosted by USM Pres.,Pres. Pahm - meeting with USM rubber team regarding Rubber Master Plan - stay at USM guesthouse
13 October (Sunday)	- visit proposed scientist housing, USM - report writing - lecture on rubber quality at USM guesthouse (25 participants including financial institutions) - dinner hosted by USM - stay at USM guesthouse
14 October (Monday)	- meeting with the USM President, Pres. Pahm - visit to a rubber quality testing laboratory (RQTL) (regarding refinements) - leave for Manila - stay in Manila
15 October (Tuesday)	- de briefing at DOST, Bicutan, Metro Manila (Sec. C. L. Follosco, Usec. R. T. Gloria, Mme. C. Melchior (French Embassy), Dr. B. P.del Rosario (PCARRD), Dr. C. R. Escano (PCARRD), Dr. A. Lulu (DA), Pres. K. Pahm (USM/PICRI), Mr. G. Benard (CIRAD-IRHO), Engr. D. Alagcan (PCARRD) - preparation of a draft contract with Dr. B. P. del Rosario, Engr. Alagcan, Mr. Benard at DOST, Bicutan - meeting with Mme. Melchior - meeting with Dr. W. Dar - stay in Manila
16 October (Wednesday)	- meeting with the French Ambassador, Olivier Gaussot - leave for Bangkok

1 - GENERAL BACKGROUND

1.1 Market Consumption

The World Market for elastomers was 15M ton in 1990. It can be shared in three parts

- Natural Rubber		5 M tons
- General purposes elastomers	)	10 M tons
- Special application elastomers	)	

The main uses of Natural Rubber are the following :

+ Tyre	70%
+ Latex product	8%
+ Footwear	5%
+ High tech application	8%
+ Miscellaneous	9%

- This market has been kept in hand by NR because of specific properties issued from its natural origin and polyisoprene structure.

1.2 Market Production

The World production of Natural Rubber is shared as follows :

- Malaysia # Thailand # Indonesia 1.2M T	29%
- Other Asian Countries	14%
- Africa	7%
- Latin America	1%

The main qualities of Natural Rubber are:

Sheets = RSS	33%
TSR	51%
Centrifuged Latex	7.5%
Others	2.5%

2. SITUATION IN PHILIPPINES

The present data and comments are based on a master plan which is being prepared and the author's mission reports of 1987 and 1989.

- Area under plantation	: 81,000 ha, with 50,000 ha tappable
- Estimated yearly production	: 120,000 tons
- Local consumption	: 60,000 tons
- Quality produced	: RSS,ADS Pale crepes, TSR 5, TSR 10, TSR 20, 2 x brown crepe, i.e. top grades and very poor ones.

The processing methods are very different i.e. coagulation, milling conditions, drying conditions

There is no rule for balling conditions and no quality control except for some processors who have special requirement from their customers.

A great amount of the smallholders production is exported in humid form and processed abroad.

With a few exceptions, tapping collection and storage of the raw humid materials are poor : storage of the lumps in waters or on the ground will involve a poor quality rubber

Exportation towards the international market with a profitable price will be only possible if the Philippines rubber can be sold with a national quality label based on international standards. For this purpose, the local industry requests information about rubber uses.

3. MAIN OBJECTIVES OF THIS PRESENT MISSION

1) To meet, discuss and finalize with appropriate officials,scientists and institutions the requirements of the proposed rubber quality testing laboratory in USM, i.e.

. the laboratory plan and the necessary adjustments or modifications
. shipment and receipt of materials/equipment from France
. reception of French counterpart, housing and vehicle
. training of the laboratory team
. sustainability of the laboratory : interest of the growers and processors to pay for certain fees, etc.
. creation of a label of quality

2) to update knowledges and informations regarding the natural rubber situation in the Philippines.

3) to determine and validate other assistance needed regarding rubber production and management aspects

4) to draft a project contract.

4. COLLECTION OF INFORMATIONS

The author visited smallholders, medium holders and rubber processors around Cotabato. Discussions were held with banking and lending institutions such as Land Bank of the Philippines, Development Bank of the Philippines in Kidapawan, Cooperatives (such as Makilala Growers Integrated Cooperative, Inc., Malasila Marketing Cooperative).

The proposed Rubber Quality Testing Laboratory in USM was visited to check on the necessary modifications prior to shipment of the laboratory equipments. The future PICRI site and the existing rubber experiment (on tapping system) was visited. A lecture on rubber quality was conducted to update the knowledge of the concerned groups : growers/processors, lending institutions, researchers.

The following informations were gathered:

4.1. Land Bank of the Philippines Assistance

- Carabao or cart for transport of cup lumps (1991)
- for 1992, assistance will be through cooperatives
- rubber growers of Makilala (MARGICO) proposed a project on processing (interest rate : 16%, medium term loan 3-5 years)

4.2. Development Bank of the Philippines Assistance

10 year (1975-85) financial assistance on rubber has been given :

. coverage 2,500 has. (smallest - 1 ha.; biggest - 100 has; Average = 5 has.)
. ₱ 30 M worth of investment with 85% repayment

- Mode of assistance: planting materials, land preparation, equipment - repayment from 9th to 15th years

- DBP Plan (1992) : - small,medium and large scale rubber industries (semi-finished and finished products), through cooperatives or single proprietorship

During the visit, the following items have been discussed :

. problem to find an appropriate technology, i.e. rubber bushing, rubber gasket, etc.

. importance of rubber quality control and that certification should be issued by USM

. research of 2 big cooperatives applying for loan for setting up processing plant to produce brown crepe (Note : the author suggests switching to TSR 10 or TSR 20 which are acceptable on the international market)

- Taking in account of this author's suggestion to go into crumb rubber production instead of crepe

- Financement of the hydro powered rubber processing plant of Mr. H. Cabacungan

- Approval of the preparation of Rubber Master Plan by USM group

- Concern on increasing productivity of current areas grown to rubber, e.g. fertilization, appropriate tapping system, other improved management systems (irrigation)

- Taking in account of financing additional areas if given opportunity to avail of long term capital markets provided price of rubber will go up as a result of quality control.

4.3. Makilala Rubber Growers Cooperative Integrated, Co. (MARGICO)

It is the first rubber cooperative in the Philippines (1986). The services it provide are the following :

- mechanizing (farm supplies, grocery items, dry goods)

- marketing :
  - . raw rubber (cup lumps) : 2.3 tons as of December 31th 1990
  - . processed rubber (2 x Brown) : 31.1 tons as of December 31th 1990
- processing (rubber sheets drying)
- planting materials (bagged budded rubber, other planting materials)
- savings (ordinary saving deposit : 7%, periodic savings deposit : 12-18%)
- lending (cash advances and cash loan)
- mortuary aid
- freight/trucking (hauling of rubber clumps and rubber wood)

N.B. : 3 other cooperatives to be formed into federation so they can apply for a loan for drying (requirement is 5 cooperatives for each federation)

4.4. BERCO Machine Shop, Kidapawan, Cotabato

This shop manufacture creeper for rubber processors and is the only modernized machine shop at Region XII.

It has expertise in assembling machines for rubber processing.

4.5. Cabacungan Machine Shop, Makilala, Cotabato

The main shop is in Davao and manufacture shredders, roller cutters, crushers.

4.6. Cabacungan Hydropowered Processing Plant, Bulatukan, Makilala

This plant was founded in 1983 but was obliged to stop in 1989 because of problems with labor union. In 1991, it is starting again.

This company produces 2 x Brown crepe (finished raw materials), about 100 bales a day and sell it at ₱ 21/kilo (or 4 FF/kg). The dryer has a 10 ton capacity and rice hull is used as energy for drying (with 2 truckloads of rice hull, they produce 10 tons of dry sheet).

The workers in the processing plant are tappers who put in 4 hours overtime (1:00 to 5:00 p.m) and they are paid ₱ 11.00/hr/worker

4.7. Malasila Makilala Rubber Industry Co.

The owner of this company is an experienced chemist.

The production is the following : clutch, tank dumps, rubber boots, fuel conk casket, generator bushing, magnetic ring, pitchel pump. Three workers for 8 hours a day are employed. The output is 20 dozens of different products and the most popular is the pitchel pump.

Raw materials (chemical) are coming from Davao City.

4.8. Malasila Marketing Cooperatives, Makilala, Cotabato

This hydro-powered cooperative (higher than Cabacungan's) is operational for 3 years. Rice hull is used as source of energy for dryer. There was not much work going on at time of our visit, farmers are still coming and bringing their cuplumps.

4.9. Rubber Wood Sawmill, Makilala, Cotabato

The output is 1,000 board feet for 8 hours

The wood is used for pallets and boxes. The main customers are Del Monte, Dole, other fruit or vegetable growers.

- 16 bd. feet/tree (lumber)
- ₱ 6.00/bd. ft. - selling price

4.10. Interview with Mayor R. Taleño, Carmen, Cotabato

He owns 230 ha rubber plantation in Carmen, 65 ha are tappable. He employs 30 tappers. The tapping system used is S_2D_2

The main clone is RRIM 600. He is still experimenting on GT_1 which is disease resistant. They fertilize at young stage.

They put cup lumps in water. (The author informed the mayor that this practice is not good and that air drying is better. Air drying will assure better quality and higher PRI)

He plans to put up a processing plant later when he is out of government services

He is selling to FARMA, PHILTRADE, Kidapawan, Cotabato.

He is sharing arrangement with tappers (70% for growers, 30% for tappers). Tappers could get as much as ₱ 6,000/mo (or 1,500 FF/mo)

4.11. PICRI site

The upland areas cover 300 hectares. It is located along the Sayore National Highway, the left side is going to Carmen, Cotabato.

The first building to be constructed this month (October 1991) will be the research one.

USM has 1000 ha in Arakan Valley with 35 ha tappable.

4.12. Lecture on Rubber quality

This lecture has been given by the author to the 20 participants listed in the annex.

5. QUALITY CONTROL LABORATORY

5.1 Introduction

The Governmental authorities of Philippines, DOST and PCARRD, and local manufacturing, PRIA, strongly support the idea of setting up a quality control laboratory in USM under the PICRI organization.

The French Government through the Commercial Section is very interested in assisting the Philippines Government to implement a comprehensive rubber development program, i.e. from production to utilization. This assistance will cover :

+ the laboratory equipment and a technical assistance from IRCA
+ training in France of two Philippines counterparts and technical support in production aspects: tapping systems and stimulation, nutrition, phytopathology (disease study).

5.2 Building

Following the mission of H. Roudeix in May 1991, a renovation started in the building which was selected (former "Crops Research Division Building"). A new distribution of the rooms has been arranged according to the layout prepared by Mr. H. Roudeix. Walls have been set up in massive concrete blocks.

Modifications proposed :

- glass windows to be installed in the inside walls of roll mill, dirt control and secretariat rooms

- doors to be constructed with combination of upper portion glass and lower portion wood materials

- reduction of the thickness of walls in the secretariat and store rooms

- the width of the door of the two roll mill room has to be maximum of 2 m. (IRCA will send the exact size of the two roll mill) and transferred to left side facing the working area.

- rubber dirt control room: installation of a working table in concrete of 70 cm wide, with 3 to 5 inclinations downwards direction and covered with porcelain tiles. Fumehood 2 m length constructed with a door that could be moved in up and down direction, bottom with mobile wall made of aluminum, individual air suction, fire extinguishers and emergency shower has to be installed.

- PRI, color analysis, Moomey, balances room: remove all cabinets on the wall

- concrete working tables, 70 cm wide for : mineralization and ash rooms on the window side, common wall side of mineralization and ash rooms/and right side of Nitrogen control room

- two back to back fume hoods on the common wall between the mineralization and ash analysis rooms with up and down morving doors.

- conference room : adjustment of the cabinet to one and a half times the existing height, the wall on the right side will be used for projection and free of cabinets, the adjacent wall to secretariat will be provided with wood working tables, a folding conference table.

- water supply : PRI, sinks on the window side of the walls in opposite corners of the rooms, solubility room: sinks on the opposite window side of the door. Mineralization room - on the right side of the room under the window and for ash analysis on the left side of the room under the window. For nitrogen analysis - on the right side of the room under the window and on the left side of room under the window of the glassware room (double sink only for the glassware room)

- air conditioning unit : 1 for the office, 2 for PRI room 1 for nitrogen, 2 for projection room and 1 for secretariat

- working Area - folding conference tables - Gas = mineralization, ash, nitrogen control

- compressed air = PRI room compressor has to be supplied by USM

5.3. **Manpower**

Training

Head of laboratory and her deputy head will be trained 4 months in France (expected April to July 1992) at IFOCA, the training school in rubber technology with a complementary training in Natural Rubber Testing methods and maintenance of the equipment at IRAP and Montpellier. A training on the use of computer will be given at IRCA Head Office.

Team

The present team includes five graduated researchers and two technicians.

A Classical rubber quality control laboratory has a maximum team of 1 Head, 1 Deputy Head, 1 typist, 1 driver and 7 workers (high school level or technicians) in charge of permanent running of the laboratory.

5.4 **Mission of the laboratory**

The laboratory will have three major responsibilities

1) specification and quality control.

- Procedures for certification of sample analysis has been prepared with the Bureau of Standards of a quality local based on ISO 2000 standard and a logo

- Procedures, timing, frequency, flow of samples from the rubber producers/growers, should be incorporated and given in the certificate

2) Quality Improvement of Philippine Natural Rubber

- Visiting of all processors of Mindanao: survey of processing methods and grades produced,
- Quality evaluation of all the grades product
- Survey of trading
- Contact with the local manufacturers to check their requirement according to the different grades
- Processing experiment with proximate processors ready to cooperate
- Elaboration of a project to reduce the consistency of various grades
- Bailing, packing and loading production

3) Applied Research Program

The laboratory must be in the USM, the starting point of applied research concerning collecting, preparing, processing conditions related to final properties of Natural Rubber.

Some simple researches can be conducted by students. More sophisticated program will be a chance of "sandwich" research between French Universities and USM.

4) Sustainability of the laboratory

The Rubber quality testing laboratory is most welcome as the realization of the dream of growers, processors and financing institutions in the country

The prospective clients indicate the willingness to pay certain fees for the analysis to be done in the lab. Fees will have to be determined on the basis of analysis.

To ensure that certification is imposed, the Department of Trade and Industries (DTI) (Bureau of Standards) could be included in the PICRI Board in addition to DTI's membership to the Rubber Industry Coordinating Committee (RICC)

5) **Production/Management Concerns**

The average production is 2.3 tons/ha of dry rubber and the target is 3.5 ton/ha.

The current practices are the following :

- tapping system: S_2D_2 (traditional)
- very limited (no fertilization, no stimulation)
- smallholders do not process their rubber

The IRCA-CIRAD experience will recommend :

- better tapping systems that could improve quality and reduce cost of labor (Cote d'Ivoire, Cameroon, etc.)
- improvement of rubber fertilization system for different soil types
- disease control.

The IRCA-CIRAD assistance requested :

- Mission in the Philippines of 2 IRCA scientists (production experts : tapping and nutrition) to conduct a minimum of one week training (jointly with USM scientists) of technicians.

- Setting up of a joint IRCA-USM collaborative research (long term) on tapping system, yield stimulation and rubber nutrition.

6. Conclusion

Considering the existing situation discovered by the author during his past two missions 1987 and 1989, there is now a very positive evaluation :

- Creparation of a master plan which will be a very useful document to explain the natural rubber situation in the Philippines; this document will be very important for the governmental institutions, financial institutions and foreign staff or politician visiting the Philippines; the author hope that this master plant will be finalized in a very short time.

- Creation of PICRI with coffee/cacao and rubber section which will have laboratory, experimental field in USM and Kabacan valley.

- Three graduates in charge for rubber of three major programs: technology, tapping system, fertilization. The author suggests that one among the three or other graduate will be the head of the group as each Rubber Research Institute in the world has a director ; and existing building for the lab and strong interest, and enthusiasm of the people in charge to go ahead for finishing the implementations before the delivery of the equipment

- Linkage initiated and strengthened with the manufacturing industry; PRIA very positive and encourages round the table discussions on technical points requirement.

- strong governmental willing and support: DOST, PCARRD

Some suggestions can be proposed :

- reactivation of the rubber growers and processors association to put the Philippines in good position in front of the international market by reducing the number of qualities to be able to offer enough lots
- continuation of contact between PRIA, USM processors, growers and financing institutions

- moving to a relative independence of the rubber section of PICRI

- more contacts with other institutions like D. A. and D.A.R. which have more means and funds

- laboratory for rubber testing: a small team of technicians permanently devoted to analysis; the graduates duty being more to carry or research, giving lecture and leading students

- a solid economical survey to previously determine the "market" of the laboratory and real price of analysis.

To close this report, the author would like to tell that he sees a bright future for the Philippines natural rubber considering the for cost project of extensions headed by reforestation program and by the existing manufacturing industry which will remain the best experimental mean to test the efficiency of the proposed laboratory and to improve the quality of national rubber.

ANNEX 1

Attendance : Lecture on Natural Rubber Quality
Lecturer : H. de Livonnière
USM Guest House
13 October 1991

NAME (PRINT)	Company/Institution
1. CARLOTA F. SANDIQUE	LASPI, Makilala
2. BELDAD I. BARROGA	USM-Chem Department
3. EVELYN T. CABADING	USM-Chem Department
4. SONIA B. ALFARO	USMARC
5. HONESTO CABACUNGAN	RIAC
6. ANTONIO BALAGOT	SP Cotabato
7. EMILIANO LIKIT	SRDC
8. MANUELA C. LALAGUNA	SRDC, Makilala
9. LILIA BORRES	LASRI, Makilala
10. JULIUS A. FERNANDEZ	MAKRUBBER
11. ROSALIO BOMBEO, Jr.	DBP Kidapawan
12. ARMAND PALERO	LASRI, Makilala
13. RAMON DAMAG	USM Extension
14. KUNDO E. PAHM	USM President
15. TENNY B. ALCALA	ATI, RTC
16. EUGENIO A. ALCALA	CA, USM
17. STELLA P. OCRETO	USM/Chem Department
18. ANTOLIN BELLO	USM-Chem Department
19. DANILO E. DOGUILES	USM/Info System/CAS
20. ANGELINA G. BAUTISTA	Director, UPIS-USM
21. ROSE MARIE BUGARIN	Doyen College of Arts and Sciences

ANNEX 2

List of Officials/scientists/growers/ processors/institutions visited

Department of Science and Technology (DOST, Bicutan, Taguig, Metro Manila

Secretary Ceferino L. Follosco
Undersecretary Ricardo T. Gloria

Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)

Dr. Beatriz P. del Rosario
Dr. Crisanto R. Escaño
Ms. J. Eusebio
Ms. Merci Sisteberio

University of Southern Mindanao/Philippine Industrial Crops Research Institute (USM/PICRI)

Pres. Kundo E. Pahm
Dr. Eugenio Alcala- (counterpart on production/tapping system)
Dr. Rose Marie Bugarin - (counterpart on quality testing laboratory)
Dr. Pablito P. Pamplona
Prof. Reynaldo S. Callano
Dr. Ramon C. Damag
Dr. Teofilo C. dela Cruz
Dr. Angelina G. Bautista
Prof. Pilar A. Bautista
Ms. Tenny Alcala
Ms. Stella Ocreto
Ms. Violeta Bello
Mr. Antolin Bello
Ms. Evelyn Cabading
Mr. Anacleto Duque, Jr.
Ms. Sonia Alfaro
Engr. Benjamin Fortinez
Mr. Danilo E. Doguiles

Land Bank of the Philippines, Kidapawan, Cotabato

Ms. F. Macanas
Engr. Andrade Lagos - Manager

Development Bank of the Philippines, Kidapawan, Cotabato

Mr. R. Bombeo, Jr. - Manager

Makilala rubber Growers Integrated, Co. (MARGICO), Kidapawan, Cotabato

Engr. Glicerio Hilario, Jr. - Vice-President

BERCO Machine Shop, Kidapawan, Cotabato

Mr. A. Bernardo, Manager

Cabacungan Machine Shop/Processing Plant, Makilala, Cotabato

Mr. H. Cabacungan - owner

Malasila Makilala Cooperative Industries (MMCI)

Mr. A. Poketa - proprietor

Malasila Marketing Cooperative

Engr. Bola - Engineer/designer

Other growers/processors

Dr. Carlota Sandique
Mr. Antonio Balagot
Mr. K. Austria

French Embassy

Ambassador O. Gaussot
Mme. C. Castagnet-Melchior
Mr. G. Mourillon
Mr. P. Nessman

CIRAD-IRHO (representative to the Philippines)

Mr. G. Bernard

Philippine Rubber Industry Association (PRIA)

Mr. Emmanuel Ching - ex-president
Mr. N. Tan - current president

Department of Agriculture - Bureau of Agricultural Research (DA-BAR)

Dr. William Dar

ANNEX 3

LIST OF ABBREVIATIONS

DOST	Department of Science and Technology
PCARRD	Philippine Council for Agriculture, Forestry and Natural Ressources Research and Development
DA	Department of Agriculture
DTI	Department of Trade Industry
PRIA	Philippine Rubber Industry Association
USM	University of Southern Mindanao
PICRI	Philippine Industrial Crop Research Institute
IRRDB	International Rubber Research Institute
ANRPC	Asian Natural Rubber Producing Country

MISSION REPORT IN THE PHILIPPINES

J.C. Touron

from October 26th to November 4th 1991

1. AIM OF THE MISSION

The International Rubber Research and Development Board Meeting, held in Manila from 24th October to 2nd November 1991, concentrated on Technology, and most of the IRCA Technology Division members were there. Mr. de Livonnière took this opportunity to ask Dr. BUGARIN from the Univerity of Southern Mindanao, who is a counterpart in the Rubber Specification Laboratory project, supported by the French Embassy in Manila, to organize a visit to the University for me.

2. MISSION SCHEDULE

26th October
- Travel Ho Chi Minh City-Manila on flight PR 592 at 11:55 a.m.
- Checked in at Manila Pavilion Hotel

27th October
- Rest day and meeting with IRCA Delegation

28th October
- IRRDB Technology Day
- Reception at the residence of the French Ambassador
- Preparation of visit to USM with Mr. de Livonnière

29th October
- **USM visit, 29th-31st October 1991**

- Left Manila 1:10 p.m. (flight PR 187) to COTABATO, by road to arrive in Kabacan at 6:00 p.m.
- Overnight at USM Guesthouse

30th October
- Morning : 8:00 a.m. - 12:00 noon
- Visit of the Philippine Standard Laboratory Testing Center at USM
- Visit of USM facilities
- Meeting with Vice-President of USM, Dr. Virgilio Oliva

- Afternoon:
- 2:00 - 5:00 meeting with the Chemistry group
- 5:00 - 6:00 visit expert's housing
- Overnight at USM Guesthouse

31st October
- Morning :
- 8:00 - 12:00 join the group to visit rubber plantations
- 12:00 lunch with the IRRDB group at USM

- Afternoon: STUDY TOUR prepared by IRRDB
- 1:00 - 3:00 visit nearby plantations
- 3:00 leave for Davao City
- Overnight at Davao City

1st November
- Sightseeing in DAVAO
- Visit scenic spots, picnic at "Villa Victoria" beach resort
- Overnight at Davao City

2nd November - Leave for Manila (8:30 a.m. flight PR 812) stopover in CEBU
- Checked in at MANILA PAVILION Hotel

3rd November - Rest and sorting through visit notes

4th November - Return to Ho Chi Minh City. Flight VN 934 at 8:35 a.m. was cancelled and replaced by flight PR 934 at 12:00 noon.

3. REPORT ON THE VISIT TO USM

3.1 Building - Philippine Standard Rubber Testing Laboratory

Suggestions in addition to Dr. de Livonniere's modification by: Expert **Jean Claude-Touron**

*** Roll mill room**

Installation of two 42 cm wide fixed benches, on the left and right-hand sides of the room and one 2m long, 42 cm wide movable bench, in the middle of the room; two milling machines and provisions for water connections (inlet & outlet) to serve as the cooling system for the machines and a side press mill to be placed to the right side of the door.

*** Dirt Room**

Installation of fume hood in the middle of the wall facing the door measuring 2.5 m in length, 1 m in width and 80 cm in height and two built-in benches for laboratory purposes on both sides of the room; i.e., on the left and right-hand sides of the room.

*** Office for the Detailed Expert**

To be furnished with electrical outlets, ceiling fans, air-conditioning unit.

*** Mineralization and Ash Room**

No changes needed

*** Kjeldahl Room**

To be provided with open shelves

*** Glassware Room**

Windows should be widened and benches should be placed near the sink, rack for drying the glassware after washing, installation of cabinets.

*** Distillation & Storage Rooms**
Secretariat & Conference Offices

No changes are to be made.

* **Installation of a generator for possible brown-outs (power between 1 or 2 KVA)**

* **Ash, nitrogen and volatile matters**

Supply of water and gas to special laboratory benches near the windows.

* **Doors**

All doors open outwards except dirt room, where door is open inwards.

* **Room for Supervisor**

This will be used by the expert supervisor. The deputy will occupy space in the conference room. Provision of office space in the conference room for privacy. Movable dividers will be installed, tables will be provided.

* **Parking Space**

Parking spaces will be provided in the front of the building for visitors. Further parking spaces will provided behind the building, with shade, for personnel, workers and producers.

3.2 **For Expert's Residence**

- provision of a garage
- fencing of expert's housing
- standby generator
- small tank for hot water (capacity : 25 gallons) with electrical heating connection
- 3 ceiling fans for dining, kitchen and third room
- 1 additional aircon unit for the living room

3.3. **Meeting with Chemistry Group**

General talks on rubber specification and working and living conditions at USM.

Television standard in the Philippines: NTSC 5.3 (US standard).

3.4. **Study Tour/IRRDB**

Chance to see the natural rubber plantations on Mindanao Island and two processing plants:

- MALASILA processes 100 gallons of latex per day to produce ADS crepe. The workshop, comprising two mini-crepers, is governed by a bucket wheel. A raceway leading from the nearby river provides the water for the wheel. In addition to his activities as a planter-producer, the owner also trades in cup lump supplied by neighbouring smallholders: around 100/120 tonnes per month.

- MAKILALA is a small processing plant. It processes slab of widely varying quality (see photos). Its range of machinery comprises three crepers, followed by crumbing in a shredder and drying in a tray dryer.

4. CONCLUSION

This was a very brief visit, but it enabled an introduction to rubber growing in the Philippines. This was most useful for the author, whose only knowledge of the Philippines had been gleaned from reports on the IRCA missions by Messrs. de la Serve, de Livonnière and Roudeix since 1986.

If the author is associated with the project the French Embassy has assigned to IRCA, it will enable him to prepare the February/March 1992 preparatory mission, the August/December 1992 implementation mission and subsequent support missions in 1993 under the best possible conditions.

ANNEX 1

PEOPLE IDENTIFIED (-) AND MET (*)

* **FRENCH EMBASSY**: AYALA LIFE BUILDING, 6786 Ayala Avenue, MAKATI, Metro Manila 3117, Tel.: 810 19 81/88, Telex: 45412, Fax: (632) 817 5047

* OLIVIER GAUSSOT: French Ambassador (Residence: 4 ANAHAW, North Forbes, MAKATI, Tel.: 810 1981)
*Mrs. CASTAGNET MELCHIOR: Commercial Counsellor
*GERARD MORILLON: Cultural Counsellor
*MICHEL FREYMUTH:

***CIRAD/IRHO**
*Mr. BENARD: CIRAD Delegate in the Philippines

***USM, UNIVERSITY OF SOUTHERN MINDANAO**, KABACAN, 9407 COTABATO
*Prof. KUNDO E. PAHM: Chancellor
*Dr. VIRGILIO G. OLIVA: Vice-Chancellor
*Dr. EUGENIO ALCALA:
*Dr. ANGELINA BAUTISTA:
*Dr. ROSEMARIE B. BUGARIN: Dean, College of Arts and Sciences
*BELDAD I. BARROGA: Chemical Engineer, College of Arts and Sciences
*ANTORLIN D. BELLO:
*VIOLETA D. BELLO: Biochemistry Professor, USMARC
*EVELYN T. CABADING: Chemist, College of Arts and Sciences
*BENJAMIN F. FORTINEZ: Work Supervisor
*RICELI C. MENDOZA: English Instructor, College of Arts and Sciences
*STELLA P. OCRETO: Chemist, College of Arts and Sciences
*LEONORA R. SUAREZ: Laboratory Technician

ANNEX 2

LIST OF CHEMICALS NEEDED FOR THE PHILIPPINE STANDARD RUBBER TESTING LABORATORY

CHEMICALS	QUANTITY	UNIT	AMOUNT
1. Mineral turpentine (high aromatic	100,000	li	1,000,000
white) b.p. 155-196 deg. Centigrade			
2. Xylyl mercaptan (36%, RPA no.3)	500	li	278,125
3. Sulfuric acid AR (sp. gr. 1.84)	5,000	li	303,750
4. Sodium hydroxide pellets	500	kg	100,000
5. Anhydrous potassium sulfate AR	500	kg	100,000
6. Copper sulfate pentahydrate AR	100	kg	11,880
7. Selennium powder AR	5	kg	63,650
8. Boric acid AR	500	kg	313,200
9. Methyl alcolhol	1	kg	2,145
10. Methylene blue	1	kg	1,048
11. Ethyl alcohol	5,000	li	491,250
12. Zinc granules	1	kg	2,500
13. Toluene	5,000	li	310,000
14. Silica gel	500	kg	15,000
15. Calcium chloride	500	kg	17,000
16. Xylene	5,000	li	250,000
17. Petrolium spirit	5,000	li	300,000
TOTAL	128,108		3,559,548

ANNEX 3

LIST OF EQUIPMENT

EQUIPMENT	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
1. Dehumidifier		2	40,000	80,000
2. Analytical balances	Sauter/Mettler	2	70,000	140,000
3. Overhead projector		1	30,000	30,000
4. Top-loading balances	1.2 kg max. cap.	2	40,000	80,000
5. Fax machine		1	90,000	90,000
6. Hand held radios		3	7,000	21,000
7. Xerox machine		1	50,000	50,000
8. Refrigerator		1	12,000	12,000
9. Aircon		1	100,000	100,000
10. Ceiling fan		3	2,000	6,000
11. Thermix stirring	144 sq. in.	2	18,000	36,000
	(12 x 12)			
Hot plates	49 sq. in.	2	16,000	32,000
12. Standby generator		1	60,000	60,000
13. Microscope	a. Heavy duty stereo	1	40,000	40,000
	b. Compound	1	30,000	30,000
14. Computer (Toshiba Brand 20-megaoctets,)		1	50,000	50,000
15. Printer (Epson)		1	30,000	30,000
TOTAL				887,000

ANNEX 4

LIST OF SUPPLYING AND VARIOUS APPARATUS

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1. Conical flasks	500 ml cap.	10	doz	4,800	48,000
2. Silica/porcelain crucibles with cover	50 ml	10	doz	1,800	18,000
3. Thermometers	-10 to 120 deg.	15	pc.	200	3,000
	-10 to 400 deg.	15	pc.	300	4,500
4. Kjeldahl flasks	30 ml Pyrex	10	doz	2,400	24,000
	800 ml Pyrex	5	doz	6,000	30,000
5. Beaker	1 L	5	doz	3,000	15,000
	2 L	2	doz	6,000	12,000
	600 ml	5	doz	3,000	15,000
	400 ml	5	doz	2,400	12,000
	250 ml	5	doz	1,140	5,700
	100 ml	50	doz	1,080	54,000
	50 ml	50	doz	1,020	51,000
6. Erlenmeyer flask	1 L	2	doz	3,600	7,200
	2 L	2	doz	6,000	12,000
	500 ml	10	doz	2,400	24,000
	250 ml	10	doz	2,100	21,000
	125 ml	10	doz	1,500	15,000
	50 ml	10	doz	1,020	10,200
SUB TOTAL					381,600
NOTE: Unit prices are in per piece basis.					
Dessicator	Glass, medium size	1	doz	2,000	24,000
Graduated cylinder	1 li	2	doz	600	14,400
	500 ml	2	doz	450	10,800
	250 ml	2	doz	400	9,600
	100 ml	2	doz	250	6,000

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
	50 ml	2	doz	200	4,800
	10 ml	2	doz	150	3,600
Pipettes	10 ml	2	doz	500	12,000
	5 ml	2	doz	400	9,600
	1 ml	2	doz	300	7,200
Oxford automatic pipettes	50 ml	1	doz	8,000	96,000
	5 ml	1	doz	6,000	72,000
Automatic burettes	25 ml	6	pcs	4,000	24,000
Acid burettes	50 ml	1	doz	2,000	24,000
Base burettes	50 ml	1	doz	1,500	18,000
SUB TOTAL					336,000
NOTE: Unit prices are in per piece basis.					
Crucible tongs	a) Budget-priced tong	10	pcs	300	3,000
	b) general purpose				
	pick-up tong	10	pcs	250	2,500
	c) nickel plated				
	crucible tong	6	pcs	500	3,000
Spatula	Wieghing spatula				
	with stainless steel				
	blade	1	doz	50	600
	Spoonula lab spoon	1	doz	100	1,200
	Porcelain spoon and spatula	2	doz	150	3,600
Reagent bottles	2 li	3	doz	300	10,800
	1 li	3	doz	250	9,000
	500 ml	3	doz	200	7,200
	250 ml	1	doz	150	1,800
Wash bottles	polythelene	1	pcs	300	300
Polythelene scoops	4 1/4 x 8	6	pcs	150	900

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
	6 x 8	6	pcs	270	1,620
Spring wound timer	1/4 to 120 minutes intervals (Fisher)	6	pcs	500	3,000
SUB TOTAL					37,020
NOTE: Unit prices are in per piece basis.					
Nalgen polypropylene carboy with spigot	50 li 10-20 li	3 6	pcs pcs	4,000 3,000	12,000 18,000
Wieghing boats (polystyrene)					
	1 3/4 sq x 3/8H	500	pcs	1.20	600
	3 5/16 x 3/4H	500	pcs	2.10	1,050
	5 1/2 x 7/8H	500	pcs	3.60	1,800
Burette brushes	for 25 & 50 ml burettes	6	pcs	30	180
Pipette washing assemblies		1	pcs	10,000	10,000
a) basket	up to 24 in. pipette				
b) jar	length				
c) rinser					
Macro-volume pipettors	1 to 5 ml	2	pcs	5000	10,000
Stirring rods		3	doz	40	1,440
Glassware cart	2 removable polyvinyl coated baskets	3	pcs	1500	4,500
SUB TOTAL					29,570
NOTE: Unit prices are in per piece basis.					
Test tubes		10	doz	20	2,400
Test tube rack		1	doz	400	4,800
Iron stand		1	doz	300	3,600
Iron ring		1	doz	80	960
Iron clamps		1	doz	80	960
Burette clamps		1	doz	100	1,200

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Wire gauze w/ asbestos		3	doz	10	360
Volumetric flasks	2 li	1	doz	1,500	18,000
	1 li	1	doz	1,250	15,000
	500 ml	1	doz	1,000	12,000
	100 ml	1	doz	750	9,000
	25 ml	1	doz	500	6,000
Funnel		3	doz	200	7,200
Watch glasses	60 mm	3	doz	25	900
	90 mm	3	doz	40	1,440
Computer diskettes		10	boxes	400	4,000
Magnetic stirring bar kit		1	kit	2000	2,000
Stir bar retriever	polyethylene, 18 in.	3	pcs	240	720
Electrical tape		1	doz	60	720
SUB TOTAL					77,340
NOTE: Unit prices are in per piece basis.					
Flexible curve template		2	pcs	500	1,000
Knife	Stainless	6	pcs	500	3,000
Flask brushes		2	doz	100	2,400
Brush w/ extension for flask curves		1	doz	150	1,800
Bunsen burner		1	doz	2,000	24,000
Aluminum trays		3	doz	300	10,800
Aluminum dishes	40 to 50 mm diameter	10	doz	200	24,000
Detergent	liquid/powder	100	boxes	60	6,000
Polyethylene bags	200 x 100 x.06 mm	500	rolls	100	50,000
Plastic clips		1000	boxes	5	5,000
Whatman NO. 542 ashless					
filter paper	15 cm diameter	1000	boxes	300	300,000
Cigarette paper	T.S.T orange cover	5000	boxes	50	250,000

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Transparent polyester/ cellulose film	.025 mm in thickness	5000	rolls	4	20,000
Fire extinguisher		3	unit	5000	15,000
SUB TOTAL					704,800
NOTE: Unit prices are in per piece basis.					
Self adhesive labels w/ microscopic border		30	rolls	330	9,900
Goggles		1	doz	100	1,200
Record books		6	doz	40	2,880
Pencils (mechanical)		18	doz	5	1,080
Laboratory wagons	Low-cost steel carts 4 inches deep trays	3	pcs	5000	15,000
Laboratory mask		1	doz	100	1,200
Pentel pens		18	doz	20	4,320
Pentel pen ink		40	bottles	60	2,400
Onion paper		60	reams	60	3,600
Thumb tacks		30	boxes	7	210
Scissors		1	doz	100	1,200
SUB TOTAL					33,090
NOTE: Unit prices are in per piece basis.					
Stapler		1	doz	300	3,600
Puncher		1	doz	300	3,600
Staple wires		100	boxes	20	2,000
Staple wire remover		1	doz	30	30
Paper clips		30	boxes	10	300
Bond Paper		60	reams	150	9,000
Mimeo paper		60	reams	60	3,600
Stencils		30	boxes	250	7,500
Mimeo ink		30	tubes	250	7,500
Carbon paper		30	boxes	100	3,000

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Folder		1000	pcs	5	5,000
Envelopes					
a) Brown		10	boxes	150	1,500
b) white		10	boxes	150	1,500
SUB TOTAL					40,930
NOTE: Unit prices are in per piece basis.					
Rulers		3	doz	10	360
Cartolina		100	pcs	10	1,000
Masking tape		3	doz	50	1,800
Scotch tape		3	doz	50	1,800
Corrector fluid					
a) stencil		1	doz	85	1,020
b) bond paper		3	doz	85	3,060
Calculators		1	doz	500	6,000
Plastic trays		3	doz	60	2,160
Test tube brush		6	doz	15	1,080
Cutter		1	pcs	5000	5,000
Wrapping film paraffin					
mt. laboratory film		10	boxes	500	5,000
Plastic sealer		30	rolls	100	3,000
Fasteners		20	boxes	10	200
Paste					
a) Starch paste		1	gal	200	200
b) Elmer's glue		1	gal	1000	1,000
SUB TOTAL					27,720
NOTE: Unit prices are in per piece basis.					
Computer paper	9 1/2 x 11 continuous form w/ side perf (1 ply)	10	boxes	700	7,000
Overhead projector pens		12	sets	300	3,600

PARTICULARS	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Transparencies		100	pcs	40	4,000
Small sable brush		1	doz	50	600
Filter cloth		10	meters	50	500
Asbestos board		3	pcs	500	1,500
Sponges		3	doz	10	360
SUB TOTAL					17,560
GRAND TOTAL					1,685,630
NOTE: Unit prices are in per piece basis.					