

#### 4.5

The Joint Committee should meet at least once a year to formulate the Annual Work Plan for the Project and to review the overall progress under the R/D. Since 1989, six (6) Joint Committee meetings were held. These have made substantial contribution towards monitoring the progress of the Project.

## 5. Outlook on Sustainability

### 5.1 Sustainability on Administration of the Project

It can be stated that the Project which aims at promoting crop improvement in Chile through the activities of collection, preservation, evaluation, quarantine and utilization of plant genetic resources, has advanced considerably in the establishment of the related facilities (e.g. base bank, active banks, quarantine greenhouse), quarantine system and research activities under the TSI.

Chilean Counterpart personnel responsible for the operation of the Project, such as the Head of the Project, two (2) Deputy Heads of the Project, three (3) bank Curators and two (2) programme Coordinators have been assigned. However, an important Chilean counterpart personnel, as curator at Quilamapu's active bank, has not been assigned.

Consideration for immediate assignment of such a responsible Chilean counterpart personnel is important for the effective establishment of the self-sustainability of the research activities concerning plant genetic resources for promoting crop improvement in Chile in the future.

### 5.2 Sustainability on Financial Aspects of the Project

BID-II five year loan (1992-1996) for an Institutional Development Plan has been considered as a basic financial element for the Project. The financial sustainability for the Project is therefore ensured until 1996. However, INIA is expected to provide continuous funds for the annual operating costs after the BID-II loan expires.

### 5.3 Sustainability of Technical Aspects of the Project

As a consequence of the technology transfer by Japanese experts and training of Chilean counterparts in Japan, significant progress has been attained in many items agreed in R/D. For example, advice for the construction of the base bank and active banks, and the construction of quarantine greenhouses, exchange of collection, multiplication of existing and collected materials, in vitro conservation, evaluation of existing resources, creation of a data base, exchange of information and research materials. As for these items, it is considered that sustainable self-supporting activities can be carried out by INIA.

In the remaining items displaying low levels of attainment due to their complexity, continuous concentrated technical transference in some selected items is considered to be necessary for the attainment of the initial goals of the Project.

## 6. Conclusions and Recommendations

### 6.1

The Project, which has been supported by the Japanese Government for the past five(5) years, has, in general, made progress towards its objectives. The Team agrees to recommend to their respective Governments to take the necessary measures for a two year follow-up programme of technical cooperation in the area of the Genetic Resources Programme described in the TSI of the Project, in order to achieve the initial objectives and acquire its self-sustainability.

The technical Cooperation Programme will concentrate on the following items:

#### A. Genetic Resources Management and Research

##### (a) Survey and Collection

- (i) Survey of Distribution
- (ii) Classification of Collection
- (iii) External Collection
- (iv) Expeditions

##### (b) Multiplication and Regeneration

- (i) Maintenance of Genetic Constitution

##### (c) Preservation and Conservation

- (i) Physiology of Germination
- (ii) Development of Long-Term in vitro Conservation Techniques
- (iii) Research on Regeneration Techniques from Cultured Materials

##### (d) Evaluation

- (i) Development of Evaluation Techniques
- (ii) Data Recording and Management
- (iii) Development of Data Processing Techniques for Evaluation

##### (e) Data Registration and Processing

- (i) Publication of index seminum
- (ii) Establishment of a National Information Network

#### B. Establishment of a Quarantine System

- (a) Development of Advanced Technologies for Detection and Therapy

#### C. Utilization of Genetic Resources Including Biotechnology

- (a) Research of Resources by Cell Engineering Techniques

- (b) Research of Resources by Genetic Engineering Techniques

The Team expects improvement of attainment by INIA in those items not mentioned above, at the end of the two year extension period.

6.2 For the effective accomplishment of the Project's activities, the Team recommends the following:

6.2.1 Necessary operational costs for the Project must be continuously provided by INIA.

6.2.2 An allocation of an appropriate number of responsible Chilean researchers and research assistants should be considered for the Project. In particular, the Team strongly recommends the designation of a curator for the active bank at Quilamapu, and suggests the designation of a researcher as an assistant to the Deputy Head for technical matters.

6.2.3 An appropriate number of Japanese experts should be dispatched smoothly throughout the extension period.

6.2.4 As for biotechnology, especially in genetic engineering, emphasis should be given to the techniques essentially related to plant breeding.

2. 合同委員会ミニッツ

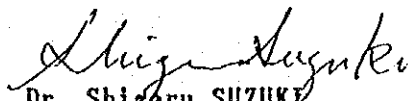
MINUTES  
JOINT COMMITTEE MEETING  
ON  
THE PLANT GENETIC RESOURCES CONSERVATION PROJECT

The Joint Committee Meeting on the Plant Genetic Resources Conservation Project, hereinafter referred to as the Project, was held between the Chilean and Japanese sides concerned as the Agricultural Research Institute (INIA), Santiago on 29 July, 1993. Both sides received the explanation of the Summary Report by the Final Evaluation Team of JICA headed by Dr. H. SEKO.

The Joint Committee made discussions and exchanged the view and then agreed the conclusions and recommendations of the Evaluation Team.

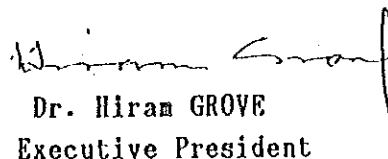
A list of attendants at the joint Committee meeting and observers concerned is attached here to as Attachment.

Santiago, July 29, 1993.

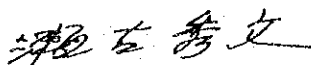


Dr. Shigeru SUZUKI

Team Leader  
JICA Experts



Dr. Hiram GROVE  
Executive President  
INIA



Dr. Hidefumi SEKO  
Head  
Final Evaluation Team

JICA  
JOINT COMMITTEE MEETING

NAME LIST OF PARTICIPANTS - CHILEAN SIDE

Name	Position and Organization
Hiram Grove V.	Executive President, INIA
<del>Alfonso Chacón</del>	<del>Director of Administration and finance, INIA</del>
Rafael Novoa	General Coordinator of Research, INIA
Sergio Bonilla	Coordinator of External Affairs, INIA
Daniel Claro	Director of La Platina Experiment Station, INIA
Alberto Cubillos P.	Coordinator of Genetic Resources Programme, INIA
Carlos Muñoz Sch.	Coordinator of Biotechnology Programme, INIA
Dr. Patricio C. Parodi	Professor, Department of Plant Science, School of Agriculture, Catholic University of Chile
Mrs. Claudia Botti	Professor, Department of Agricultural and Forestry Sciences, University of Chile
<del>Mr. Raúl Vergara</del>	<del>Programme Coordinator, Chilean International Cooperation Agency (AGCI)</del>

JICA  
JOINT COMMITTEE MEETING

NAME LIST OF PARTICIPANTS - JAPANESE SIDE

Name	Position and Organization
Hidefumi Seko	Leader, JICA's Mission
Yasufumi Kunihiro	Member, Ditto
Kiyotaka Kawakami	Ditto
Junichi Hanai	Ditto
Shozo Tabuse	Representative, JICA Chile Office
Shigeru Suzuki	Leader, JICA Project
Kazuo Hoshino	Expert, JICA Project
Yoichi Okawara	Coordinator, JICA Project
Nobuhiro Moriyama	First Secretary, Embassy of Japan in Chile

3. INIA 総裁コメント

**COMMENTS TO THE SUMMARY REPORT  
OF THE JOINT EVALUATION MISSION  
ON THE PLANT GENETIC RESOURCES CONSERVATION PROJECT  
IN THE REPUBLIC OF CHILE**

HIRAM GROVE V.  
Executive President  
Instituto de Investigaciones Agropecuarias

**I. INTRODUCTION.**

I would like to thank the members of the Joint Evaluation Mission for their work and the exhaustive report on the progress of the JICA/INIA Project during the past 5 years before starting with my comments.

I also want to let you know that both the Government of Chile and INIA has given a high priority to the conservation, utilization and protection of our genetic resources. As a result of this the JICA/INIA Project has gained importance in the agricultural research priorities. The Project will also enable the consolidation of the newly created programs of Genetic Resources and Plant Biotechnology in INIA.

**II. INPUT TO THE PROJECT.**

I fully agree that the dispatch of Japanese experts and training of Chilean personnel has been a successful activity of the Project. The provision of equipment has also been very generous and will guarantee the success of all planned activities.

Financial support by the Chilean Government has been also substantial, particularly through the BID I loan and is been complemented by additional operational budget through the BID II loan.

**III. ACTIVITIES OF THE PROJECT AND DEGREE OF ATTAINMENT.**

**1. Advice for the construction of base bank, active banks and other facilities.**

We are pleased with the facilities that were implemented, particularly the base and active banks,



which were constructed under the supervision of various Japanese experts. They were implemented to our complete expectation. We do not foresee by the time being a possibility to implement a solar energy system at the base bank, although we agree that it is an ideal system that should be considered.

Building additional quarantine greenhouses should be decided based on the performance, demand and capacity of the existing facilities. In this respect a follow-up program of the Project is essential to clarify this unknown.

## **2. Genetic Resources Management and Research.**

The distribution of plant species of agricultural interest is well known in Chile. We agree in that distribution maps should be made in order to assist prospection and collection works. Therefore we also consider progress in this area unsatisfactory and that efforts should be made to attain the objectives of the Project.

The idea to perform external collections of genetic resources is very important, but because we have not yet fully explore our own territory, we feel that we should first concentrate our efforts in the Chilean flora. External collections is a subject that should be carefully studied during the follow-up period before assigning it a definitive priority.

We also think in agreement with the Japanese Technical Guidance Team that the research lines in physiology of seed production, maintenance of genetic constitution and analysis of seed longevity should be suspended and replaced by appropriate literature surveys.

Seed and vegetatively plant conservation has been given a high priority in the budget assigned by the BID II loan, therefore, I guarantee you that all banks will be used to their full possible capacity.

We would like a clarification of the meaning of "long-term in vitro conservation". We understand it as a synonym of cryopreservation. We feel that this field might not have a high priority by the time being, if this is the correct interpretation. Therefore, we suggest that the subject be carefully analyzed before starting any activity.

We consider that the studies related to the physiology of seed germination should concentrate only in native and endemic species for which there is no published information available.

We also agree in that little progress has been made in the evaluation of genetic resources. We have planned specific projects with BID II, FIA and CIP funding that will considerably improve the progress in this area.

The great advance in computing technologies induced significant changes in the system used by INIA. These changes affected the development of several activities of our Project. We will very soon implement the new system, which considers national and international networking. We are taking all the technical and administrative measures to make the migration of the old to the new system as fast and smooth as possible.

### **3. Establishment of a quarantine system.**

The quarantine facilities were the last to be implemented, and due to unpredictable reasons, its operation was delayed. Therefore, activities and technology transfer in this area should be increased in the near future.

### **4. Utilization of genetic resources including biotechnology.**

We agree with the Mission's criteria for the follow-up program in this area. However, we feel that that oil crops have lost priority for today's Chilean agriculture. We appreciate the work done with rapeseed and we will continue using it as a model system for other relevant crops.

## **IV. IMPACT OF THE PROJECT.**

We also feel that the Project has had a great impact for INIA and the Chilean agriculture and we hope that the impact will increase with the consolidation of the Project and the research programmes that were created as its consequence at INIA.

## **V. ADMINISTRATION OF THE PROJECT.**

We have a strong commitment towards a modernization of our institution. This forced several changes in the administrative and operational structure of our organization, which, with no doubt, affected the Project. We expect that the Project should continue to run smoothly, now all these changes have been done and new responsibilities have been assigned. I hope that you understand the new role assigned to the Directors of the different Experiment Stations which now are more autonomous to make decisions within the region of their responsibility.

I hope that our Director at Quilamapu informed you of the decision of assigning a curator for the bank before the end of the year.

I am also confident that all Station Directors will assign research assistants for the banks as soon as possible.

I would like to know which is the rationale for assigning an additional researcher for genetic resources at La Platina. We may consider such assignment if we agree in that rationale. However, I would like to stress that hiring additional staff is limited by our fixed budget.

## **VI. OUTLOOK ON SUSTAINABILITY.**

It is my opinion that the sustainability of the Project is guaranteed through the structure given to the BID II loan. Both staff hiring and operational costs were budgeted to the Chilean counterpart of the Project. The Chilean Government has the intention to maintain this budget after the loan finishes in 1996. This provides the means to sustain the activities initiated with this BID II program.

As far as technical sustainability, I am sure that our researchers will be capable of supporting the Project, specially after receiving their training in Japan.

## **VII. CONCLUSIONS AND RECOMMENDATIONS.**

We fully agree in that, for the success of the Project, at least a 2-year extension is needed. We

feel that a 3-year extension is more adequate to achieve the expected goals. However, we perfectly understand that this ambition has to be compatible with the Japanese Government policies and regulations.

I would like to express my gratitude to the Joint Evaluation Mission for recommending such a follow-up of the Project, which with no doubt, is essential to enable the consolidation of this activity of high priority for the country.

We basically agree in the technical areas recommended for the follow-up period, except those activities where we have already given our opinion and proposed further study to assign them an adequate priority considering the Project's goals and our national objectives and possibilities. The subjects that we consider should be reviewed are:

- The use of solar energy at the base bank,
- The increase of quarantine greenhouses,
- The collection of plant species in foreign countries, and,
- The use of cryopreservation of genetic resources.

We agree on the importance of the recommendations related to staff and operational funds. They are vital to the success of the Project. I hope that my explanations on our policies, strategies and limitations have been clear enough. We will take the necessary measures to assign a curator at Quilamapu Experiment Station and the corresponding research assistants at those Stations were they are still lacking. However, the assignment of a new researcher at La Platina Experiment Station must be carefully studied. We are also confident to provide an adequate operational funding.

We consider of a great importance and appreciate the recommendation of a smooth dispatch of Japanese experts. We are fully convinced that they are an essential element to achieve the expected goals.

We also agree with the recommendation related to emphasize the use of biotechnologies in plant breeding, especially those related to genetic engineering.

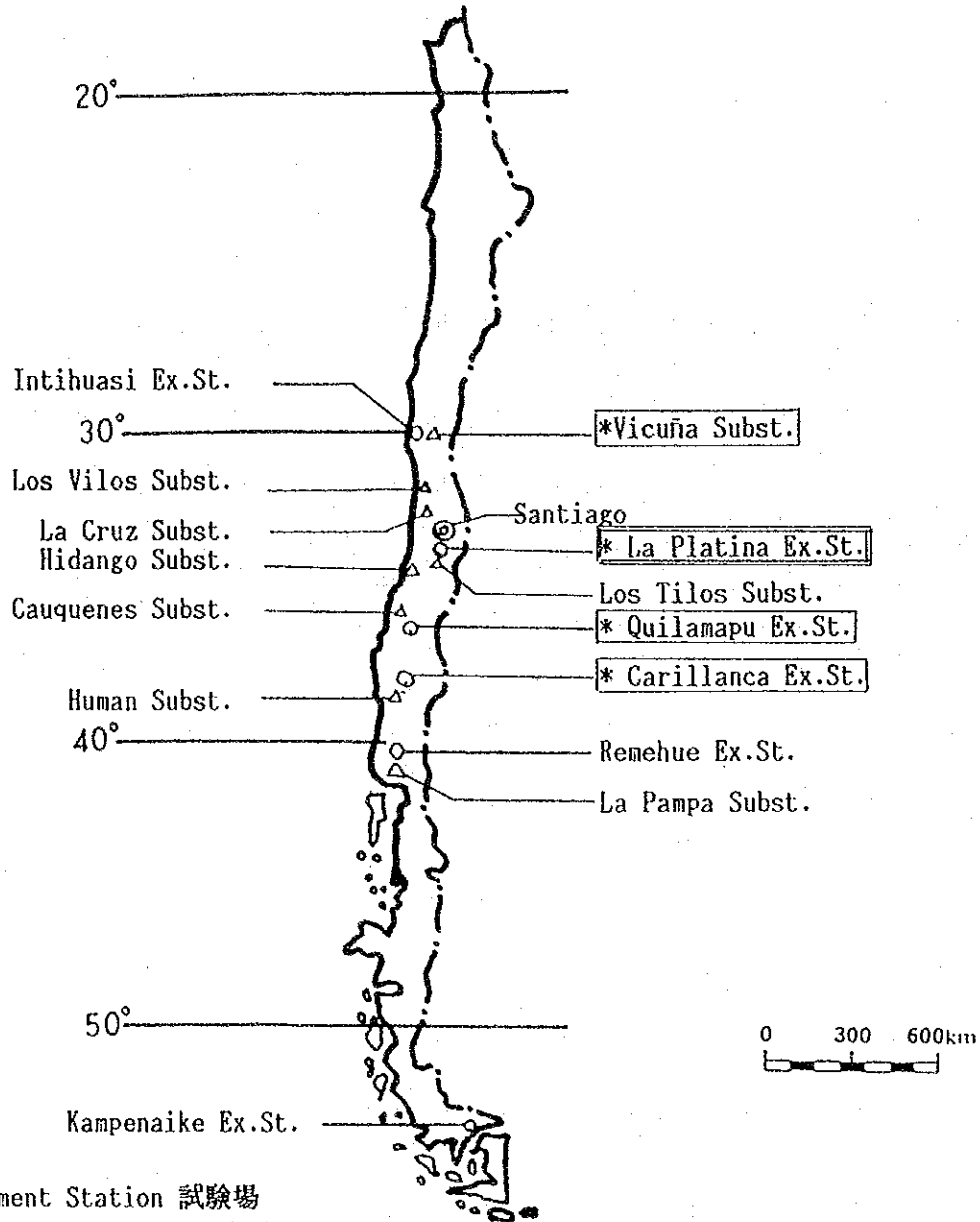
Finally I would like to acknowledge the fine work of the Project's Leader, Dr. Shigeru Suzuki, who

has put all his knowledge and personal skills in conducting the Project. We hope to continue to have his leadership during the follow-up period. This also applies for Mr. Yoichi Okawara who has conducted the administrative aspects of the Project very neatly.



## 別添 4 : 合同評価レポート Annex

Location of Experiment Stations and  
Experiment Substations of the  
Agricultural Research Institute (1993)



○: Experiment Station 試験場

△: Experiment Substation 支場

\*: The Base Bank, Active Banks and Facilities for the Plant Genetic Resources

Conservation Project 作物遺伝資源研究開発施設整備計画の対象試験場

- Vicuña Experiment Substation ..... Base Bank
- La Platina Experiment Station ..... Active Bank  
Isolation Greenhouse  
Experimental Farm  
Other related facilities
- Quilamapu Experiment Station ..... Active Bank
- Carillanca Experiment Station ..... Active Bank



Annex 2 Joint Evaluation Schedule

Date	Time	Schedule
July 21 (Wed)	10:00--12:00	Presentation of activities of the Project by C/P and Japanese experts
	12:00--13:30	Visiting relevant facilities at La Platina
	15:00--17:30	Presentation of activities of the Project by C/P and Japanese experts
July 22 (Thu)	9:30--17:30	Discussions with C/P and Japanese experts
	23:00--	Traveling to La Serena
July 23 (Fri)	8:30--9:00	Visiting Intihuasi Experiment Station
	10:30--12:30	Visiting Vicuña Experiment Substation
	23:00--	Traveling to Santiago
July 24 (Sat)		Preparing tentative draft of Summary Report
July 25 (Sun)		Traveling to Chillan
July 26 (Mon)	8:00--11:30	Visiting Quilamapu Experiment Station
	11:30--16:30	Traveling to Temuco
	16:30--17:30	Visiting Carillanca Experiment Station
	18:30--	Traveling to Santiago
July 27 (Tue)	9:00-13:30	Joint Evaluation Meeting (Drafting the Summary Report)
	14:30--17:30	Joint Evaluation Meeting (Continued)
July 28 (Wed)	9:00--13:00	Joint Evaluation Meeting (Drafting the Summary Report)
	15:00--17:30	Joint Evaluation Meeting (Continued)
	17:30--	Explanation of the draft of Summary Report to the Head of the Project and Japanese Team Leader
July 29 (Thu)	9:00--13:00	Joint Evaluation Meeting (Finalizing the Summary Report)
	14:00--15:00	Joint Evaluation Meeting (Continued)
	15:00--16:00	Joint Evaluation Meeting (Signing the Summary Report)
	16:30--	Participating in Joint Committee Meeting (Submitting and explaining of the Summary Report)

Annex 3: The Record of Discussions between the Authorities concerned of the Government of Japan and the Government of the Republic of Chile on the Japanese Technical Cooperation for the Plant Genetic Resources Conservation Project (Signed on December 27, 1988)

THE RECORD OF DISCUSSIONS  
BETWEEN THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF JAPAN  
AND THE GOVERNMENT OF THE REPUBLIC OF CHILE  
ON THE JAPANESE TECHNICAL COOPERATION FOR  
THE PLANT GENETIC RESOURCES CONSERVATION PROJECT

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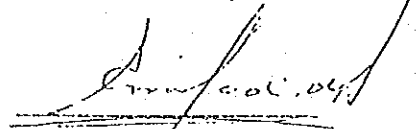
The Japan International Cooperation Agency (hereinafter referred to as "JICA"), with regard to the recommendation of the Minutes of Discussions of the Preliminary Study dated April 7, 1988, had a series of discussions through the Resident Representative of JICA in Chile with the authorities concerned of the Government of the Republic of Chile in view of the desirable measures to be taken by both Governments for the Japanese Technical Cooperation Program for the Plant Genetic Resources Conservation Project.

As a result of the discussions, JICA and the authorities concerned of the Governments of the Republic of Chile taking into account the provisions of the Agreement of Technical Cooperation between the Government of Japan and the Government of the Republic of Chile ("ACUERDO SOBRE COOPERACION TECNICA ENTRE EL GOBIERNO DEL JAPON Y EL GOBIERNO DE LA REPUBLICA DE CHILE") signed in Santiago on July 28, 1978 (hereinafter referred to as "the Agreement") agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

SANTIAGO, *December 27* de 1988,

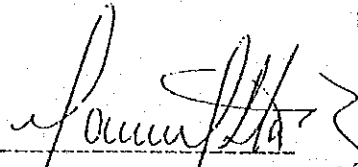


HIROKO KURAMOCHI  
RESIDENT REPRESENTATIVE IN CHILE  
JAPAN INTERNATIONAL COOPERATION  
AGENCY



EMILIO MADRID CERDA  
PRESIDENT EXECUTIVE OF  
THE AGRICULTURAL RESEARCH INSTITUTE  
REPUBLIC OF CHILE

For witness,



JAIME DE LA SOTTA BENAVENTE  
MINISTER OF AGRICULTURE  
OF THE REPUBLIC OF CHILE

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Republic of Chile will cooperate with each other in implementing the Plant Genetic Resources Conservation Project (hereinafter referred to as "the Project") for promoting crop improvement in Chile through activities for collection, preservation, evaluation and utilization of Plant Genetic Resources.
2. The Project will be implemented in accordance with the Master Plan which is given in I of the Annex.

II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take the necessary measures through JICA to provide, at its own expense, services of the Japanese experts as listed in II of the Annex through the normal procedures under the technical cooperation scheme of the Government of Japan.
2. Privileges, exemptions and benefits will be granted to the Japanese experts and their families by the Government of the Republic of Chile according to the provisions of article 6 of the agreement.



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### III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take the necessary measures through JICA to provide, at its own expense, such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in III of the Annex, through the normal procedures under the technical cooperation scheme of the Government of Japan.
2. The Equipment will become the property of the Government of the Republic of Chile upon being delivered CIF to the Chilean authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese experts referred to in II of the Annex.

### IV. SPECIAL MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In order to assure the smooth implementation of the Project, the Government of Japan will take the necessary measures through JICA as follows :

- (1) In accordance with the laws and regulations in force in Japan, to supplement a portion of the local expenditures for the execution of the physical infrastructure such as construction work of the isolation nursery units of the isolation greenhouse and so on when necessity arises.



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- (2) To promote technical assistance activities through JICA's scheme of the Technical Assistance Activities for Genetic Resources.

V. TRAINING OF CHILEAN PERSONNEL IN JAPAN


1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take the necessary measures through JICA to accept, at its own expense, the Chilean personnel connected with the Project for technical training in Japan through the normal procedures under the technical cooperation scheme of the Government of Japan.
2. The Government of the Republic of Chile will take the necessary measures to ensure that the knowledge and experience acquired by the Chilean personnel who have received technical training in Japan will be utilized effectively for the implementation of the Project.

VI. SERVICES OF CHILEAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. In accordance with laws and regulations in force in the Republic of Chile, the Government of the Republic of Chile will take the necessary measures to secure, at its own expense, the necessary services of Chilean counterpart and administrative personnel as listed in IV of the Annex.
2. The Government of the Republic of Chile will allocate the necessary number of suitably qualified personnel corresponding to the Japanese experts to be dispatched by the Government of Japan, as specified in II of the Annex, for the effective and successful transfer of technology under the Project.

VII MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF CHILE

1. In accordance with the laws and regulations in force in the Republic of Chile, the Government of the Republic of Chile will take the necessary measures to provide at its own expense :

  
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- (1) Land, buildings and facilities as listed in V of the Annex;
- (2) Supply or replacement of equipment, machinery, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under III above;
- (3) Transportation facilities and travel allowances for the official travel of Japanese experts within the Republic of Chile;
- (4) Suitably furnished accommodation for the Japanese experts and their families.

2. In accordance with the laws and regulations in force in the Republic of Chile, the Government of the Republic of Chile will take the necessary measures to meet:

- (1) Expenses necessary for the transportation of the Equipment within the Republic of Chile, as well as for the installations, operation and maintenance thereof.
- (2) Custom duties, internal taxes and any other charges, imposed on the Equipment in the Republic of Chile.
- (3) All running expenses necessary for the implementation of the Project.

#### VIII ADMINISTRATION OF THE PROJECT

1. The President Executive of the Agricultural Research Institute (INIA) of Chile will bear overall responsibility for the implementation of the Project, with the support of the Development Manager of INIA for the administrative and managerial matters and of the Associate Director of Crop Research for the technical matters of the Project.
2. The Japanese Team Leader will provide necessary recommendations and advice on technical and administrative matters concerning the implementation of the Project to the Head of the Project.



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3. The Japanese expert will give necessary technical guidance and advice to the Chilean counterpart personnel on matters pertaining to the implementation of the Project.
4. For the effective and successful implementation of the Project, a Joint Committee will be established with the functions and composition as referred to in VI of the Annex.

IX. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Republic of Chile undertakes to bear all claims, if any should arise, against the Japanese experts engaged in the Project, resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Chile except for those arising from the willful misconduct or gross negligence of the Japanese experts according to the provisions of article 7 of the agreement.

X MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

XI TERM OF COOPERATION

The duration of the Technical Cooperation for the Project under this Attached Document will be five (5) years from Jan. 1, 1989.



A N N E X

I. MASTER PLAN

1. Objectives of the Project

The project aims at promotion of crop improvement in the Republic of Chile through the following activities to be conducted at the Platina and other Experiment Stations of the Agricultural Research Institute (INIA).

2. The Japanese Technical Cooperation included in the Project

- (1) Consultation for the construction of the base bank, active banks and facilities.
- (2) Technical guidance and advice to the Chilean counterpart personnel through research activities in the following subjects.
  - a) Exploration, collection, preservation, evaluation, multiplication and conservation of plant genetic resources
  - b) Establishment of quarantine system on introduction of germplasms
  - c) Utilization of biotechnology in breeding mainly of fruit trees, vegetables and oil crops.
- (3) Exchange of necessary information, data and research materials.

Note : In order to support the activities mentioned above, the Government of Japan will take necessary measures, such as information supply, field survey and so on, through JICA's scheme of the Technical Cooperation Activities for Plant Genetic Resources.

  
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## II. JAPANESE EXPERTS

Experts in the fields of :

(1) Plant Breeding

(2) Genetic Resources Management

Note : a) One of the experts will be nominated as Team Leader.

b) The other expert will be nominated as Coordinator.

c) Short-term experts may be dispatched when necessity arises, for the smooth implementation of the Project.

## III. LIST OF EQUIPMENT

1. Equipment, machinery, instruments, tools, spare parts and other materials for the base bank, active banks, laboratory and field survey.
2. Audio-visual equipment
3. Vehicles and their spare parts
4. Books and other printed matters
5. Other necessary equipment and materials related to the Project

## IV. LIST OF CHILEAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Head of the Project (The President Executive of the Agricultural Research Institute (INIA)).
2. (1) Deputy Head of the Project for Administrative and Managerial Matters; Development Manager of the Agricultural Research Institute (INIA).



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(2) Deputy Head of the Project for Technical Matters : Associate Director of Crop Research of the Agricultural Research Institute (INIA).

3. Counterpart personnel in the fields of :

(1) Plant Breeding

(2) Genetic Resources Management

(3) Other fields concerned with the Project mutually agreed upon as necessary.

4. Administrative Personnel :

(1) Administrative Officers

(2) Accounting officers

(3) Typists

(4) Other necessary officers

5. Other necessary personnel mutually agreed upon.

V. LIST OF LAND, BUILDING AND FACILITIES

1. Buildings and facilities for base bank at Vicuña Experimental Sub station, and active banks at Carillanca, Quilamapu and La Platina Experimental Stations.

2. Laboratory greenhouse and experimental farm land of La Platina experimental Station.

3. Rooms and space necessary for the installation and storage of the Equipment and materials provided by the Government of Japan.

4. Office space and necessary facilities for the Japanese Team Leader, Coordinator and Experts.

5. Other facilities mutually agreed upon as necessary.



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## VI THE JOINT COMMITTEE

### 1 Functions

The Joint Committee will meet at least once a year and whenever necessity arises, and work:

- (1) To formulate of the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;
- (2) To review the overall progress of the Project as well as the achievements of the above mentioned Annual Work Plan;
- (3) To review and exchange views on major issues arising from or in connection with the Project.

### 2. Composition

#### (1) Chairman :

Executive President of the Agricultural Research Institute (INIA)

#### (2) Chilean Side :

- 1) General Manager of The Agricultural Research Institute (INIA)
- 2) Development Manager of the Agricultural Research Institute (INIA)
- 3) Associate Director of Crop Research of the Agricultural Research Institute (INIA)
- 4) Representative of Ministry of Agriculture
- 5) Other personnel appointed by chairman

#### (3) Japanese Side

- 1) Team Leader
- 2) Coordinator
- 3) Experts
- 4) Representative of JICA in Chile
- 5) Personnel dispatched by JICA Headquarter if necessary.

Note : Official(s) of the Embassy of Japan may attend the Joint Committee as observers.

Annex 4 : Tentative Schedule of Implementation for the Plant Genetic Resources Conservation Project in the Republic of Chile (Signed on December 5, 1989)

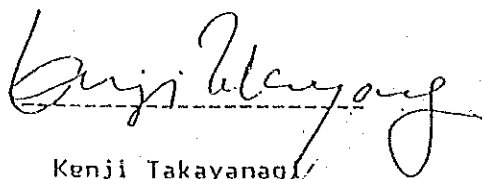
1. TSI (暫定実施計画)

TENTATIVE SCHEDULE OF IMPLEMENTATION  
FOR THE PLANT GENETIC RESOURCES CONSERVATION PROJECT  
IN THE REPUBLIC OF CHILE

The Japanese Planning and Consultation Team and the Agricultural Research Institute (INIA) of the Republic of Chile have jointly formulated the Tentative Schedule of Implementation of the Plant Genetic Resources Conservation Project in the Republic of Chile (hereinafter referred to as "the Project") as annexed hereto.

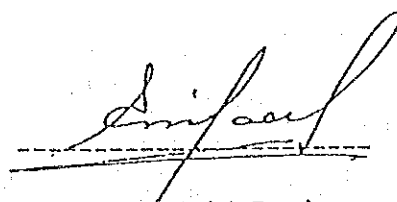
This has been formulated on the basis of the Record of Discussions on the Japanese Cooperation for the Project signed on December 27, 1988 between the Resident Representative in Chile of the Japan International Cooperation Agency and the authority concerned of the Agricultural Research Institute and on the conditions that the necessary budget will be allocated for the implementation of the Project by both sides, and that the above mentioned Schedule is subjected to change within the framework of the Record of Discussions when necessity arises in the course of implementation of the Project.

SANTIAGO, December 5, 1989



Kenji Takayanagi  
Leader

The Planning and Consultation Team  
Japan International Cooperation Agency  
Japan



Emilio Madrid Cerda  
Presidente Ejecutivo  
Instituto de Investigaciones  
Agropecuarias  
República de Chile

Activities of the Project

Item	Fiscal Year (※)	1st. '89	2nd. '90	3rd. '91	4th. '92	5th '93
I. CONSTRUCTION OF BASE BANK, ACTIVE BANKS AND OTHER FACILITIES						
II. GENETIC RESOURCES PROGRAM						
1. Genetic resources management and research						
(1) Survey and collection						
(2) Multiplication and regeneration						
(3) Preservation and conservation						
(4) Evaluation						
(5) Data registration and processing						
2. Establishment of quarantine system						
3. Utilization of genetic resources, including biotechnology						
III EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS						

(※) Japanese Fiscal Year: 1st. April to 31st. March.

Technical Cooperation Program (Japanese side)

Item	Fiscal Year(*)	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
I. DISPATCH OF EXPERTS						
1. Long - term assignment						
(1) Genetic resources management						
(2) Plant breeding						
2. Short-term assignment		Experts will be dispatched when necessity arises				
II. ACCEPTANCE OF CHILEAN PERSONNEL		About 3 to 4 persons a year				
III. PROVISION OF EQUIPMENTS, MACHINERIES AND MATERIALS						
IV. SPECIAL MEASURES						

(\*) Japanese Fiscal Year: 1st. April to 31st. March

Technical Cooperation Program (Chilean side)

Item	Fiscal Year (#)	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
<b>I. ASSIGNMENT OF COUNTERPARTS AND ADMINISTRATIVE PERSONNEL</b>						
1. Head of the project						
2. Deputy head of the project						
3. Counterpart personnel in following fields:						
(1) Genetic resources management and research						
(2) Plant breeding						
(3) Quarantine management and research						
(4) Other fields		When necessity arises.				
4. Administrative personnel						
(1) Administrative officers						
(2) Accounting officers						
(3) Secretaries						
(4) Other necessary officers						
<b>II. PROVISION OF LAND, BUILDINGS AND OTHER NECESSARY FACILITIES</b>						
<b>III. ALLOCATION OF NECESSARY BUDGET</b>						

(\*) Japanese Fiscal Year: 1st. April to 31.st March

I CONSTRUCTION OF THE BASE BANK , ACTIVE BANKS AND OTHER FACILITIES.

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
A. SEED STORAGE		-----				
B. QUARANTINE GREENHOUSES		-----				

PERSONNEL IN CHARGE : S. SUZUKI, T. TOYAO.

COUNTERPARTS : C. ORTIZ (DEVELOPMENT MANAGER), C. BERTRAND (GENETIC RESOURCES),  
 H. ALVAREZ (DEPUTY DIRECTOR), A. CUBILLOS (DIRECTOR),  
 H. SOTOMAYOR (ARCHITECT).



II - 1 GENETIC RESOURCES MANAGEMENT AND RESEARCH.

(1) SURVEY AND COLLECTION

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
1) RESEARCH ON STRATEGY OF COLLECTION						
2) DETERMINATION OF PRIORITY						
3) SURVEY OF DISTRIBUTION						
4) CLASSIFICATION OF COLLECTIONS						
5) INTERNAL COLLECTION						
6) EXTERNAL COLLECTION						
7) EXCHANGE OF COLLECTIONS						
8) EXPEDITIONS						

PERSONNEL IN CHARGE : S. SUZUKI, I. TOYAO.

COUNTERPARTS : C. ORTIZ (DEVELOPMENT MANAGER), C. BERTRAND (GENETIC RESOURCES),  
M. ALVAREZ (DEPUTY DIRECTOR), A. CUBILLOS (DIRECTOR),  
H. SOTOMAYOR (ARCHITECT).

II - 1 GENETIC RESOURCES MANAGEMENT AND RESEARCH.  
 (2) MULTIPLICATION AND REGENERATION.

ITEM	FISCAL YEAR	1st. '89	2nd. '98	3rd. '91	4th. '92	5th. '93
1) MULTIPLICATION OF EXISTING RESOURCES						
2) MULTIPLICATION OF COLLECTED RESOURCES						
3) PHYSIOLOGY OF SEED PRODUCTION						
4) MAINTENANCE OF GENETIC CONSTITUTION						

PERSONNEL IN CHARGE : S. SUZUKI, T. TOYAO.

COUNTERPARTS : C. BERTRAND (GENETIC RESOURCES), R. CORTAZAR (GENETICS),  
 O. PARAFIORI (MAIZ), I. RAMIREZ ( WHEAT), E. BERAITO (BARLEY  
 AND OATS), H. ESCAFF (VEGETABLES), G. BASCUR (DRY LEGUMES),  
 P. SOTO (FORAGES), A. CUBILLOS (COORDINATOR).

II - 1 GENETIC RESOURCES MANAGEMENT AND RESEARCH.

(3) PRESERVATION AND CONSERVATION.

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
1) ANALYSIS OF SEED LONGEVITY						
2) SEED AND VEGETATIVE PLANT CONSERVATION						
3) PHYSIOLOGY OF GERMINATION						
4) IN VITRO CONSERVATION						
5) DEVELOPMENT OF LONG - TERM IN VITRO CONSERVATION TECHNIQUES						
6) RESEARCH ON REGENERATION TECHNIQUES FROM CULTURED MATERIALS						

PERSONNEL IN CHARGE : S. SUZUKI, I. TOYAO.

COUNTERPARTS : C. BERTRAND (GENETIC RESOURCES), M. ESCAFF (VEGETABLES),  
C. MUNOZ (BIOTECHNOLOGY), J. VALENZUELA (FRUITS AND GRAPES),  
J. S. ROJAS (POTATOES), C. CIUDAD (BIOCHEMISTRY), H. HEWSTONE  
(TISSUE CULTURE).

II — 1 GENETIC RESOURCES PRESERVATION, MANAGEMENT AND RESEARCH.  
 (4) EVALUATION.

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
1) STANDARDIZATION OF EVALUATION METHODS						
2) EVALUATION OF EXISTING RESOURCES						
3) DEVELOPMENT OF EVALUATION TECHNIQUES						
4) DATA RECORDING AND MANAGEMENT						
5) DEVELOPMENT OF DATA PROCESSING TECHNIQUES FOR EVALUATION						

PERSONNEL IN CHARGE : T. TOYAO, S. SUZUKI.

COUNTERPARTS : C. BERTRAND (GENETIC RESOURCES), I. PENA (COMPUTER SCIENCES), O. PARATORI (MAIZ), I. RAMIREZ ( WHEAT), E. BERATTO (BARLEY AND OATS), J. J. ROJAS (POTATOES), H. ESCAFF (VEGETABLES), J. VALENZUELA (FRUITS AND GRAPES), G. BASCUR (DRY LEGUMES), R. ALVARADO (RICE), P. SOTO (FORAGES), A. CUBILLOS (COORDINATOR).

II - 1  
(5)

GENETIC RESOURCES PRESERVATION, MANAGEMENT AND RESEARCH.  
DATA REGISTRATION AND PROCESSING.

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
1) SURVEY AND USE OF EXISTING DATA		-----				
2) STANDARIZATION OF DATA		-----				
3) DESIGN OF INFORMATION SYSTEM		-----				
4) CREATION OF DATA BASE			-----			
5) DATA INPUT			-----			
6) PUBLICATION OF INDEX SEMINUM					-----	
7) ESTABLISHMENT OF NATIONAL INFORMATION NETWORK					-----	
8) INTERNATIONAL EXCHANGE OF INFORMATION BY NETWORK					-----	

PERSONNEL IN CHARGE : S. SUZUKI, I. TOYAO.

COUNTERPARTS : C. ORTIZ (DEVELOPMENT MANAGER), C. BERTRAND (GENETIC RESOURCES),  
M. ALVAREZ (DEPUTY DIRECTOR), A. CUBILLOS (DIRECTOR),  
H. SOTOHAYOR (ARCHITECT).

II - 2 ESTABLISHMENT OF QUARANTINE SYSTEM

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
a. SURVEY OF QUARANTINE SYSTEMS IN OTHER COUNTRIES FOR RESEARCH MATERIALS						
b. ESTABLISHMENT OF QUARANTINE PROTOCOLS FOR RESEARCH MATERIALS						
c. CONFORMATION WITH NATIONAL QUARANTINE REGULATIONS						
d. ESTABLISHMENT OF A NATIONAL QUARANTINE SYSTEM FOR RESEARCH MATERIALS						
e. DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR DETECTION AND THERAPY						

PERSONNEL IN CHARGE : S. SUZUKI, T. TOYAO.

COUNTERPARTS : H. ALVAREZ (FRUIT AND GRAPE PHYTOPATHOLOGY), H. CAGLEVIC (CEREAL PHYTOPATHOLOGY), G. HERRERA (PLANT VIROLOGY), P. SEPULVEDA (DRY LEGUME PHYTOPATHOLOGY), A. BRUNA (VEGETABLE PHYTOPATHOLOGY), C. FERNANDEZ (POTATO PHYTOPATHOLOGY), H. GONZALEZ (NEMATODOLOGY), E. PRADO (ENTOMOLOGY), C. CIUDAD (BIOCHEMISTRY), H. HEWSTONE (TISSUE CULTURE).

II - 3 UTILIZATION OF GENETIC RESOURCES INCLUDING BIOTECHNOLOGY.

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
a. UTILIZATION OF RESOURCES BY CONVENTIONAL TECHNIQUES						
b. RESEARCH OF RESOURCES BY CELL ENGINEERING TECHNIQUES						
c. RESEARCH OF RESOURCES BY GENETIC ENGINEERING TECHNIQUES						

PERSONNEL IN CHARGE : T. TOYAO, S. SUZUKI.

COUNTERPARTS : C. MUNOZ (FRUIT AND GRAPE BIOTECHNOLOGY), N. HEWSTONE (TISSUE CULTURE), C. CIUDAD (BIOCHEMISTRY).

M. ESCAFF (VEGETABLE BREEDING), F. ORIEGA (PASTURE BREEDING), J. KALAZICH (POTATO BREEDING), I. RAMIREZ (WHEAT BREEDING), E. BERATTO (BARLEY AND OAT BREEDING), R. ALVARADO (RICE BREEDING), N. LIZAMA (RAPE SEED BREEDING), C. MUNOZ (FRUIT AND GRAPE BREEDING).

3. EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS.

ITEM	FISCAL YEAR	1st. '89	2nd. '90	3rd. '91	4th. '92	5th. '93
A. PREPARATION OF MANUALS						
B. SEMINARS, CONFERENCES AND MEETINGS						
C. PUBLICATIONS						
D. SHORT TERM COURSES						
E. EXCHANGE OF BREEDING MATERIALS						

PERSONNEL IN CHARGE | S. SUZUKI, T. TOYAO.

COUNTERPARTS | C. ORTIZ (DEVELOPMENT MANAGER), C. BERTRAND (GENETIC RESOURCES),  
H. ALVAREZ (DEPUTY DIRECTOR), A. CUBILLOS (DIRECTOR),  
H. SOTONAYOR (ARCHITECT).



Annex 5 : Amendment to the Record of Discussions on the Japanese Technical Cooperation for the Plant Genetic Resources Conservation Project in Chile (signed on August 28, 1990)

Annex  
AMENDMENT  
TO THE RECORD OF DISCUSSIONS  
ON  
THE JAPANESE TECHNICAL COOPERATION  
FOR  
THE PLANT GENETIC RESOURCES CONSERVATION PROJECT  
IN  
CHILE


Mr. Kazutoshi Iwanami, the Resident Representative of Japan International Cooperation Agency (hereinafter referred to as "JICA") in Chile, and the authorities concerned of the Government of Chile agreed to make the amendments to the Record of Discussions of the technical cooperation for the Plant Genetic Resources Conservation Project in Chile (hereinafter referred to as "the Project") signed on December 27, 1988, as follows:

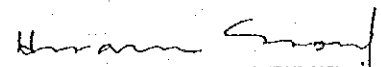
(1) With respect to the paragraph II, in the Annex. An expert will be dispatched as Coordinator newly, thereby the paragraph shall be amended to add the sentence "(3) Coordinator" and to get rid of the sentence "b) The other expert will be nominated as Coordinator".

(2) With respect to the paragraph VIII.1 in the Attached Document and the paragraph IV.2 and VI.2(2) in the Annex, Administrative Director of INIA will replace Development Manager of INIA, and will be responsible for the administrative and managerial matters of the Project, as the Deputy Head of the Project. And National Coordinator of Genetic Resources Program of INIA will replace the Associate Director of Crop Research of INIA, and will be responsible for the technical matters of the Project, as the Deputy Head of the Project.

(3) With respect to the paragraph VI.2(2) in the Annex. Special Project Coordinator of INIA will be added to the members of the Chilean Side of the Joint Committee.

Santiago, August 28, 1990.

  
Mr. Kazutoshi Iwanami  
RESIDENT REPRESENTATIVE  
IN CHILE  
JAPAN INTERNATIONAL  
COOPERATION AGENCY

  
Mr. Hiram Grove  
PRESIDENT EXECUTIVE OF  
THE AGRICULTURAL RESEARCH  
INSTITUTE  
REPUBLIC OF CHILE

Annex 6 : Japanese Contributions  
(1) Dispatch of Japanese Experts

Annex 6(1): Japanese Contributions, Dispatch of Experts  
DISPATCH OF EXPERTS (LONG TERM)

FISCAL YEAR	NAME (FIELD)	YEAR	1988	1989	1990	1991	1992	1993
	Dr. SHIGERU SUZUKI (TEAM LEADER, GENETIC RESOURCE MANAGEMENT)		3/1					
(4)	Dr. TADAYUKI TOYAO (COORDINATOR, PLANT BREEDING)		5/13				5/12	
	Dr. KAZIO HOSHINO (PLANT BREEDING)						4/13	
	Dr. YOICHI OKAWERA (COORDINATOR)				10/22			

12/31

12/31

12/31

DISPATCH OF EXPERTS (SHORT TERM)

FISCAL YEAR	NAME (FIELD)	YEAR	1988	1989	1990	1991	1992	1993
8 8 (2)	Mr. YASUYUKI ASAKURA (GENETIC RESOURCE FACILITIES)		11/27-12/4					
	Mr. ISAMI YAMAZAKI (APPARATUS FACILITIES/MACHINERY)		11/27-12/4					
8 9 (3)	Mr. YASUYUKI ASAKURA (DESIGN OF QUARANTIN GREENHOUSE)			11/27-12/17				
	Mr. GOSUKE MOTOHAMA (DESIGN OF QUARANTIN GREENHOUSE)			11/27-12/17				
	Mr. KAZUMORI NOTSUHKA (GRAPE BREEDING)			4/4 --- 5/31				
9 0 (6)	Dr. KINZO KUMAGAI (DESIGN OF DATA BASE SYSTEM)				5/30 --- 7/30			
	Mr. YASUYUKI ASAKURA (CONSTRUCTION OF QUARANTINE GREENHOUSE)				10/10 - 11/17			
	Dr. YASUNBU OKAWA (BIOTECHNOLOGY ON RAPESEED BREEDING)				11/30 --- 1/14			
	Mr. MASARU TANAKA (BIOTECHNOLOGY ON VEGETABLE BREEDING)				3/1 --- 5/1			
	Mr. GOSUKE MOTOHAMA (CONSTRUCTION OF QUARANTINE GREENHOUSE)				3/25 - 4/23			
	Mr. RYOJI KIMURA (GENETIC RESOURCE MANAGEMENT)				4/10 --- 7/10			
9 1 (5)	Dr. FUMIHIRO FUJIMOTO (FORAGE CROP BREEDING)					10/18 - 11/29		
	Dr. KIYOHARU ONO (BIOTECHNOLOGY ON RICE BREEDING)					2/25 - 3/24		
	Dr. TETSURO SAMADA (QUARANTINE MANAGEMENT)					3/20 - 4/18		
	Dr. KAZUTOSHI OKUNO (GENETIC RESOURCES COLLECTION AND EVALUATION)					3/20 - 4/18		
	Dr. RYU OSUGI (EVALUATION OF PHOTOSYNTHESIS OF FORAGE CROPPERS)					3/20 --- 5/2		
9 2 (5)	Dr. SHIGEO NISHIMURA (BIOTECHNOLOGY)						10/26 - 11/25	
	Mr. SHUNSUKE ODA (WHEAT BREEDING AND BIOTECHNOLOGY)						2/1 - 2/23	
	Mr. AKIO KIKUCHI (GENETIC RESOURCES COLLECTION AND EVALUATION)						2/17 - 3/22	
	Mr. HIROYASU YAMANE (GRAPE BREEDING)						3/16 - 4/13	
	Dr. MORIO IIZUKA (QUARANTINE MANAGEMENT)						4/7 --- 7/5	

Annex 6(2): Japanese Contributions, Training of Chilean Personnel in Japan

FISCAL YEAR	NAME (FIELD)	YEAR	1988	1989	1990	1991	1992	1993
89 (3)	Mr. CLAUDIO ORTIZ (OBSERVATION: RESEARCH MANAGEMENT)		9/24 - 10/12					
	Mr. FERNANDO ORTEGA (FORAGE CROPS G.R. MANAGEMENT)			3/21 - 9/13				
	Mr. NOICES ESCAFF (VEGETABLE G.R. MANAGEMENT)			3/28 - 5/19				
90 (5)	Mr. CESAR BERTRAND (PLANT G.R. MANAGEMENT)			5/14 - 10/28				
	Mr. AGUSTIN ALJARO (VEGETABLE G.R. MANAGEMENT)			6/9 - 7/9				
	Mr. GALALIER LEMUS (FRUIT TREE BREEDING)			8/9 - 8/29				
	Dr. JORGE VALENZUELA (FRUIT TREE G.R. MANAGEMENT)			8/6 - 8/29				
	Dr. GUIDO HERRERA (QUARANTIN SYSTEM)			3/31 - 5/21				
91 (6)	Dr. CARLOS HUNOZ (BIOTECHNOLOGY)					7/18 - 8/18		
	Mr. MARIO KELLADO (WHEAT BREEDING)					7/18 - 8/20		
	Dr. HIRAM GROVE (OBSERVATION: RESEARCH MANAGEMENT)					7/20 - 8/4		
	Miss PAULINA SEPULVEDA (PATHOLOGICAL QUARANTINE)						3/17 - 4/22	
	Mr. ENRIQUE PENALOZA (G.R. EVALUATION)						3/17 - 5/27	
	Mr. EDMUNDO BERRATTO (OBSERVATION: RESEARCH MANAGEMENT)						3/31 - 4/25	
92 (5)	Dr. ROBERTO ALVARADO (G.R. MANAGEMENT, RICE BREEDING)						8/24 - 10/14	
	Mr. ALTURO LAVIN (GRAPE BREEDING)						8/24 - 10/21	
	Dr. RAFAEL NOVOA (OBSERVATION: RESEARCH MANAGEMENT)							3/3 - 3/24
	Mrs. BLANCA LUZ PINILLA (QUARANTINE/PATHOLOGY)							3/30 - 6/13
	Miss MARISOL MUÑOZ (BIOTECHNOLOGY)							3/30 - 6/16

## Annex 6(3): Japanese Contributions, Prevision of Equipment

BASE BANK

List of Equipment 1/5

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US\$	TOTAL PRICE. US\$	USE	MAINTENANCE	REMARKS
89	AIR CONDITIONING SYSTEM, EMERGENCY POWER GENERATOR AND INSULATION PANELS *	1	80,679	80,679	A	A	
	MOISTURE TESTER *	2	4,380	8,760	B	A	
	OTTAWA SEED BLOWER *	1	5,835	5,835	B	A	
	TV MONITORING SYS *	1	4,500	4,500	A	A	
90	PICK-UP TRUCK(4WD,DOUBLE CABIN) *	1	13,900	13,900	A	A	
	SEED COUNTER	2	6,595	13,190	A	A	
	CONSOLE GERMINATOR	1	11,018	11,018	A	A	
	SEED CONTAINING BOTTLES(0.25L)	1	10,429	10,429	A	A	10,000 BOTTLES
	PERSONALCOMPUTER *	1	8,991	8,991	A	A	
	CENTRIFUGAL SEED DIVIDER *	1	6,400	6,400	B	A	
	STEREOMICROSCOPE *	1	3,605	3,605	B	A	
	SEED CONTAINING ENVELOPE	1	2,304	2,304	B	A	15,000 ENVELOPS
ENVELOPE SEALER	1	1,429	1,429	B	A		
91	LABORATORY CLIPPER	1	12,127	12,127	B	A	
	ELECTRONIC BALANCE *	1	3,135	3,135	A	A	
92	CONSOLE GERMINATOR *	1	12,360	12,360	A	A	
	DATA RECORDER(BAR-CODE READER SYS.) *	1	8,652	8,652	B	A	
	DEHUMIDIFIER *	1	7,830	7,830	B	A	
	DRYING OVEN	1	1,844	1,844	B	A	
SEED CONTAINING BOTTLE(1L) *	1	1,220	1,220	A	A	2,500 BOTTLES	
TOTAL				218,208			
93	ELECTRONIC ACRYLIC DESICATOR CABINET	1					
	WATER PURIFICATION SYSTEM	1					

## ACTIVE BANK LA PLATINA

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US\$	TOTAL PRICE. US\$	USE	MAINTENANCE	REMARKS
89	AIR CONDITIONING SYSTEM, EMERGENCY POWER GENERATOR AND INSULATION PANELS *	1	98,306	98,306	A	A	
	STATIONWAGON *	1	21,159	21,159	A	A	
	CONSOLE GERMINATOR *	1	18,907	18,907	A	A	
	LABORATORY CLIPPER *	1	13,080	13,080	B	A	
	MOISTURE TESTER *	2	4,380	8,760	A	A	
	SEED COUNTER	1	7,432	7,432	A	A	
	OTTAWA SEED BLOWER *	1	5,835	5,835	B	A	
	CENTRIFUGAL SEED DIVIDER *	1	4,908	4,908	B	A	
90	GRAVITY SEPARATOR *	1	32,968	32,968	B	A	
	STATIONWAGON JEEP *	1	19,000	19,000	A	A	
	SEED COUNTER *	2	6,595	13,190	A	A	
	SEED CONTAINING BOTTLES(0.25L)	1	10,429	10,429	A	A	10,000 BOTTLES
	AIR PULS SEED DIVIDER *	1	6,400	6,400	B	A	
	STEREOMICROSCOPE *	1	3,605	3,605	B	A	
	MOISTURE TESTER DIGITAL *	1	2,326	2,326	A	A	
	SEED CONTAINING ENVELOPE	1	2,304	2,304	B	A	15,000 ENVELOPS
ENVELOPE SEALER	1	1,429	1,429	B	A		
91	SEED CONTAINING BOTTLES(0.25L)	1	10,299	10,299	A	A	10,000 BOTTLES
	ELECTRONIC BALANCE *	1	3,135	3,135	A	A	
	ENVELOPE SEALER	2	1,567	3,134	B	A	
92	SEED GERMINATOR *	1	12,360	12,360	A	A	
	AIR CONDITIONER FOR SPARE *	1	6,047	6,047	D	A	
	DATA RECORDER(BAR-CODE READER SYS.) *	1	5,788	5,788	B	A	
	SEED CONTAINING BOTTLE(1L) *	1	1,220	1,220	A	A	2,500 BOTTLES
TOTAL				312,021			
93	DEHUMIDIFIER	1					
	WATER PURIFICATION SYSTEM	1					

Note: \* Purchased in Chile

## ACTIVE BANK QUILAHAPU

## List of Equipment 2/5

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US\$	TOTAL PRICE. US\$	USE	MAINTENANCE	REMARKS
89	AIR CONDITIONING SYSTEM, EMERGENCY POWER GENERATOR AND INSULATION PANELS	* 1	88,444	88,444	A	A	
	MOISTURE TESTER	* 1	4,380	4,380	A	A	
90	SEED COUNTER	* 2	6,595	13,190	A	A	
	CONSOLE GERMINATOR	* 1	11,018	11,018	A	A	
	SEED CONTAINING BOTTLES(0.25L)	1	10,429	10,429	A	A	10,000 BOTTLES
	OTTAWA SEED BLOWER	* 1	7,024	7,024	B	A	
	CENTRIFUGAL SEED DIVIDER	* 1	6,400	6,400	B	A	
	STEREOMICROSCOPE	* 1	3,605	3,605	B	A	
	MOISTURE TESTER DIGITAL	* 1	2,326	2,326	A	A	
	SEED CONTAINING ENVELOPE	1	2,304	2,304	B	A	15,000 ENVELOPS
ENVELOPE SEALER	1	1,429	1,429	B	A		
91	GRAVITY SEPARATOR	1	22,761	22,761	B	A	
	PICK-UP TRUCK(4WD, DOUBLE CABIN)	* 1	14,000	14,000	A	A	
	LABORATORY CLIPPER	1	12,127	12,127	B	A	
	SEED CONTAINING BOTTLES(0.25L)	1	10,299	10,299	A	A	10,000 BOTTLES
	PERSONAL COMPUTER	* 1	6,700	6,700	A	A	
ELECTRONIC BALANCE	* 1	3,135	3,135	A	A		
92	AIR CONDITIONER FOR SPARE	* 1	6,047	6,047	D	A	
	DATA RECORDER(BAR-CODE READER SYS.)	* 1	5,788	5,788	A	A	
	SEED CONTAINING BOTTLE(1L)	* 1	1,220	1,220	A	A	2,500 BOTTLES
TOTAL				232,626			
93	DEHUMIDIFIER	1					
	WATER PURIFICATION SYSTEM	1					

## ACTIVE BANK CARILLANCA

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US\$	TOTAL PRICE. US\$	USE	MAINTENANCE	REMARKS
89	AIR CONDITIONING SYSTEM, EMERGENCY POWER GENERATOR AND INSULATION PANELS	* 1	88,570	88,570	A	A	
	MOISTURE TESTER	* 2	4,380	8,760	A	A	
	OTTAWA SEED BLOWER	* 1	5,835	5,835	B	A	
90	GRAVITY SEPARATOR	* 1	32,968	32,968	B	A	
	SEED COUNTER	* 2	6,595	13,190	A	A	
	CONSOLE GERMINATOR	* 1	11,018	11,018	A	A	
	SEED CONTAINING BOTTLES(0.25L)	1	10,429	10,429	A	A	10,000 BOTTLES
	PERSONAL COMPUTER	* 1	8,991	8,991	A	A	
	CENTRIFUGAL SEED DIVIDER	* 1	6,400	6,400	B	A	
	STEREOMICROSCOPE	* 1	3,605	3,605	B	A	
	SEED CONTAINING ENVELOPE	1	2,304	2,304	B	A	15,000 ENVELOPS
ENVELOPE SEALER	1	1,429	1,429	B	A		
91	PICK-UP TRUCK(4WD, DOUBLE CABIN)	* 1	14,000	14,000	A	A	
	LABORATORY CLIPPER	1	12,127	12,127	B	A	
	SEED CONTAINING BOTTLES(0.25L)	1	10,299	10,299	A	A	10,000 BOTTLES
	ELECTRONIC BALANCE	* 1	3,135	3,135	A	A	
92	AIR CONDITIONER FOR SPARE	* 1	6,047	6,047	D	A	
	DATA RECORDER(BAR-CODE READER SYS.)	* 1	5,788	5,788	B	A	
	SEED CONTAINING BOTTLE(1L)	* 1	1,220	1,220	A	A	2,500 BOTTLES
TOTAL				246,115			
93	DEHUMIDIFIER	1					
	WATER PURIFICATION SYSTEM	1					

Note: \* Purchased in Chile

## LABORATORY OF BIOTECHNOLOGY

## List of Equipment 3/5

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE-US\$	TOTAL PRICE-US\$	USE	MAINTENANCE	REMARKS	
89	PLANT GROWTH ENVIRONMENTAL CHAMBER	*	2	12,015	24,030	A	A	
	DNA-SEQU GEL ELE.PHORESIS		1	21,805	21,805	B	A	
	PERSONAL COMPUTER	*	1	10,036	10,036	A	A	
	ANALYTICAL BALANCE		3	2,877	8,631	A	A	
	LAMINAR FLOW HOOD	*	1	8,422	8,422	A	A	
	MICROCENTRIFUGE REFRIGERATED		1	6,216	6,216	A	A	
	LIGHTING SYS FOR TISSUE CULTURE	*	2	2,554	5,108	A	A	
	FREEZER	*	1	5,090	5,090	A	A	
	STEREOMICROSCOPE WITH ILLUMINATION	*	1	4,858	4,858	A	A	
	REFRIGERATOR	*	2	2,325	4,650	A	A	
	HOMOGENIZER POLYTRON OR HISSOTRON		1	4,387	4,387	A	A	
	WATER PURIFICATION SYSTEM	*	2	2,012	4,024	A	A	
	ORBITAL SHAKER	*	1	2,920	2,920	A	A	
	AIR CONDITIONER		3	927	2,781	A	A	
	BOTTLETOP DISPENSERS, ADJUSTABLE		2	1,247	2,494	A	A	
	BALANCE		1	2,396	2,396	A	A	
	MICROCENTRIFUGE		1	2,288	2,288	A	A	
	PIPET WASHING ASSEMBLY		1	2,196	2,196	A	A	
	MAGNETIC STIRRER/HOT PLATE		2	966	1,932	A	A	
	POTENTIOMETER	*	1	1,917	1,917	A	A	
	MICROPIPETES ADJUSTABLE(4/BOX)		2	902	1,804	A	A	
	HYGROTHERMOGRAPH		3	580	1,740	A	A	
	REPETITIVE DISPENSER		1	1,115	1,115	A	A	
	EPPENDORF TUBES,0.5ml		20	51	1,020	A	A	
	EPPENDORFF TUBES,1.5ml		10	54	540	A	A	
	COREX TUBES 30ml WITH SCREW CAP(36/BOX)		1	480	480	A	A	
	DISPOSABLE TIPS,200-1000ml		10	47	470	A	A	
	DISPOSABLE TIPS,0-200ml		10	37	370	A	A	
	COREX TUBES 15ml WITH SCREW CAP(100/BOX)		1	324	324	A	A	
	COREX 30 ADAPTER(12/BOX)		1	148	148	A	A	
COREX 15 ADAPTER(12/BOX)		1	148	148	A	A		
HYGROMETER/THERMOMETER		3	34	102	A	A		
90	ULTRACENTRIFUGE	*	1	78,574	78,574	B	A	
	LIGHT MICROSCOPE	*	1	33,186	33,186	A	A	
	INVERTED MICROSCOPE	*	1	16,514	16,514	A	A	
	AUTOCLAVE, HORIZONTAL	*	1	11,678	11,678	A	A	
	SAFETY FLOW FUME HOOD	*	1	6,989	6,989	A	A	
	STEREOMICROSCOPE WITH PHOTO TUBE	*	1	5,895	5,895	A	A	
	AIR PURIFIER	*	3	1,175	3,525	A	A	
	CAMERA SYSTEM	*	1	3,009	3,009	B	A	
	WATER STILL	*	1	2,537	2,537	A	A	
	MIXER WITH HOLLOW THROUGHSHAFT		1	918	918	A	A	
	ULTRASONIC CLEANER	*	1	611	611	A	A	
	PHOTOMETER	*	1	346	346	A	A	
	91	SPECTROPHOTOMETER	*	1	28,500	28,500	B	A
ROTOR FOR ULTRACENTRIFUGE		*	1	16,950	16,950	B	A	
ULTRAFREEZER		*	1	5,580	5,580	A	A	
FRACTION COLLECTOR		*	1	4,900	4,900	B	A	
ICE MAKER		*	1	4,142	4,142	A	A	
THERMOREGULATED BATH			2	1,254	2,508	A	A	
DEWAR FLASKS 20L			2	1,231	2,462	A	A	
INCUBATOR		*	1	2,190	2,190	A	A	
ANNULAR FIBER OPTIC ILLUMINATOR			1	1,567	1,567	A	A	
OVEN FOR DRYING AND STERILIZING			1	1,455	1,455	A	A	
EPI FL EXITATION FILTER BLOCK		*	1	1,450	1,450	B	A	
AIR CONDITIONER		*	1	1,180	1,180	A	A	

Note: \* Purchased in Chile

## LABORATORY OF BIOTECHNOLOGY

List of Equipment 4/5

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US\$	TOTAL PRICE. US\$	USE	MAINTENANCE	REMARKS
9 1	LIGHTING SYSTEM FOR TISSUE CULTURE *	2	450	900	A	A	
	DEWAR FLASKS 5L	2	422	844	A	A	
	HAND PUMP FILTER SYSTEM	2	414	828	A	A	
	MAGNIFICATION SYSTEM ILLUMINATED	1	522	522	A	A	
	GLASS ELECTRODES	2	198	396	A	A	
	SCHOTT DURAN BOTTLES 1L	24	13	312	A	A	
	SCHOTT DURAN BOTTLES 250ml	48	6	288	A	A	
	SCHOTT DURAN BOTTLES 100ml	48	6	288	A	A	
	SCHOTT DURAN BOTTLES 500ml	24	10	240	A	A	
	DESCICATORS, 250mm	1	201	201	A	A	
	SLIDE STAINING SET	1	194	194	A	A	
	SYRINGE HAMILTON S	4	45	180	A	A	
	SCHOTT DURAN BOTTLES 50ml	24	6	144	A	A	
	PIPET WASHER	1	112	112	A	A	
DESCICATORS, 100mm	1	67	67	A	A		
9 2	DENSITOMETER *	1	30,115	30,115	B	A	
	ROTOR FOR ULTRACENTRIFUGE *	1	10,460	10,460	B	A	
	POLINERASE CHAIN REACTION *	1	8,720	8,720	A	A	
	STEREOMICROSCOPE *	2	3,560	7,120	B	A	
	WALK-IN COLD CABINET *	1	6,410	6,410	A	A	
	ELECTRO PORATION *	1	6,070	6,070	A	A	
	INVERTED MICROSCOPE *	1	3,460	3,460	A	A	
	ORBITAL SHAKER *	1	3,170	3,170	A	A	
	ROTOR FOR MICROCENTRIFUGE	1	2,016	2,016	A	A	
GRADIENT MAKER *	1	760	760	B	A		
TOTAL				454,925			
9 3	CO <sub>2</sub> INCUBATOR	1					
	ROTOR FOR ULTRACENTRIFUGE	1					
	MINI VERTICAL ELECTROPHORESIS SYSTEM	1					
	MINI ISOELECTRIC FOCUSING SYSTEM	1					
	BIO-DOT MICROFILTRATION APPARATUS	1					
	HIGH-PRESSURE LIQUID CHROMATOGRAPHY SYSTEM	1					

Note: \* Purchased in Chile

QUARANTINE SYSTEM

List of Equipment 5/5

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US\$	TOTAL PRICE. US\$	USE	MAINTENANCE	REMARKS
9 1	LIGHT MICROSCOPE	*	1	29,000	29,000	A	A
	ELISA IMMUNO READER	*	1	19,200	19,200	A	A
	SAFETY FLOW FUME HOOD	*	1	5,285	10,570	A	A
	REFRIGERATOR, EXPLOSION PROOF		1	9,933	9,933	A	A
	LAMINAR FLOW CABINET	*	2	3,650	7,300	A	A
	AUTOCLAVE, VERTICAL		1	7,164	7,164	B	A
	STEREOMICROSCOPE, ZOOM	*	2	3,500	7,000	A	A
	WATER STILL	*	1	6,900	6,900	A	A
	INCINERATOR		2	6,739	6,739	C	A
	AUTOCLAVE, TABLETOP		1	2,358	4,716	A	A
	INCUBATOR		1	1,366	4,098	A	A
	MICROCENTRIFUGE		2	3,313	3,313	A	A
	MICROPIPETTES, ADJUSTABLE		3	1,761	1,761	A	A
	STERILIZER OVEN, FORCED CONVECTION		1	1,515	1,515	A	A
	MAGNIFICATION SYSTEM ILLUMINATED		1	493	986	A	A
	PRECISION ELECTRONIC BALANCE		1	978	978	A	A
	DEWAR FLASKS 25L	*	2	840	840	A	A
	BACTERIAL COLONY COUNTER		1	664	664	A	A
	UV LAMP, HAND-HELD		1	470	470	A	A
9 2	ELECTRON MICROSCOPE	*	1	182,500	182,500	A	A
	MICROTOME WITH GLASS KNIFE MAKER	*	1	47,540	47,540	A	A
	PLANT GROWTH ENVIRONMENTAL CHAMBER	*	1	7,420	7,420	A	A
	ULTRA LOW FREEZER	*	1	4,510	4,510	A	A
TOTAL					365,117		

Note: \* Purchased in Chile

\*1. AMOUNT FOR 1993 98,313 US\$

\*2. TOTAL AMOUNT 1,927,325 US\$

\*3. EXCHANGE RATE Y/US\$ 1989: 148.0 1990:140.0 1991:134.0 1992:122.0 1993:108.5

FREIGHT AND OTHER CHARGES

89		5,726
90		15,322
91		22,475
92		2,171
TOTAL		45,694

CONSTRUCTION OF QUARANTINE GREENHOUSE

9 0	HIGH SECURITY GREENHOUSE	1	75,222	A	A
	MEDIUM SECURITY GREENHOUSE	1	59,153	A	A
9 1	NET HOUSE	1	8,766	A	A
TOTAL			143,141		



Annex 6(4):Japanese Contributions, Local Running Costs and others (US\$)

FISCAL YEAR	GENERAL EXPENSES	INTERNATIONAL EXCHANGE OF TECHNOLOGY	PUBLICATIONS	SEMINARS	TOTAL
89	40,310	8,690	3,025	-	52,025
90	32,978	-	-	3,522	36,500
91	35,856	-	-	-	35,856
92	40,204	6,420	-	6,720	53,344
93	48,824	-	-	9,302	58,126
TOTAL	198,172	15,110	3,025	19,544	235,851

Annex 7(1):Chilean Contributions, Staff Allocation  
Name of Counterpart Personnel and Sector of Activities

ITEMS	NAME OF PERSONS	EXPERTISE/POSITION	DE LONG TRG* EXP. STA.	INCHARGE OF ACTIVI. OF TSI									REMARKS	
				I	II - I					II 2	II 3	III		
					①	②	③	④	⑤					
Head of the Project	H. Grove	Executive President												
Deputy Head of the Project (Administrative and Managerial Matters)	A. Chacon	Administrative Director												
Deputy Head of the Project	A. Cubillos	Coordinator for G.R.												
Assistant Deputy Head of the Project	C. Muñoz	Coordinator for Biotec.												
Coordinator and Bank Curator														
Coordinator:Genetic Resources	A. Cubillos	Genetic Resources	LPL	○	○	○	○	○	○				○	A. Bank & Quara. Cu.
Coordinator:Biotechnology	C. Muñoz	Biotechnology	LPL	○	○		○					○		
Base Bank Curator	C. Bertrand	Genetic Resources	JNT	○	○	○	○	○	○				○	
Active Bank Curator	I. Segel	Genetic Resources	CAR		○	○	○	○	○				○	
Coordinator:Rice #	R. Alvarado	Genetic Resources	QLM		○	○	○	○	○			○	○	
Quarantine Curator	G. Herrera	Virus	LPL								○			
Coordinator:Wheat	I. Ramirez	Wheat	LPL		○	○		○				○		
Coordinator:Maize	O. Paratori	Maize	LPL		○	○		○						
Coordinator:Fruits	J. Valenzuela	Fruits	LPL				○	○						
Coordinator:Vegetables	A. Aljaro	Vegetables	LPL		○	○	○	○				○		
Coordinator:Beans	J. Tay	Beans	QLM		○	○		○						
Coordinator:Porage	H. Acuña	Porage	QLM		○	○		○						
Coordinator:Plant Pathology	R. Nadariaga	Crop Diseases	QLM								○			
Coordinator:Barley, Oat	E. Beratto	Barley, Oat	CAR		○	○		○				○		
Coordinator:Potatoes	J. Kalazich	Potatoes	REM		○		○					○		
Researchers in each Sector														
	P. Hinrichsen	Biotechnology	LPL					○				○		
	N. Hewstone	Tissue culture	LPL				○				○	○		
	H. Muñoz	Biotechnology	LPL									○		
	H. Escaff	Vegetables	LPL					○				○		
	R. Cortázar	Genetics	LPL		○									
	G. Lenus	Fruit	LPL									○		
	C. Ciudad	Biochemistry	LPL				○				○	○		
	J. E. Sierra	Computer	LPL					○	○					
	S. Altamirano	Public Information	LPL						○					
	H. Alvarez	Fruit Diseases	LPL									○		
	D. Pinilla	Fruit Diseases	LPL									○		
	P. Sepúlveda	Bean Diseases	LPL									○		
	H. González	Nematodes	LPL									○		
	A. Bruna	Vegetable Diseases	LPL									○		
	P. Ortega	Porage	CAR									○		
	N. Lizana	Rapeseed	CAR									○		
	H. Campos	Rapeseed	CAR					○				○		
	C. Hewstone	Wheat	CAR						○			○		
	E. Peñaloza	Beans	CAR						○			○		

Annex 7(2):Chilean Contributions, Operating Costs (US\$)

YEAR	GENETIC RESOURCES PROGRAMME	BIOTECHNOLOGY PROGRAMME	CONSTRUCTIONS	INFRA- STRUCTURES	TOTAL
89		3,332			
90		29,827			
91		47,771			
92		117,000			
93		123,000			
TOTAL		320,930	539,051	12,505	872,486

Annex 8 : Progress of Activities Submitted by Japanese Experts

PROGRESS OF ACTIVITIES IN EACH FIELD  
 1. CONSTRUCTION OF THE BASE BANK, ACTIVE BANKS AND OTHER FACILITIES.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF PROLONGATION RATE
1. SEED STORAGE	To advice about design and construction of safe and effective long-term & mid-term seed storages.	5	Construction was completed and tested with satisfactory result. Although minor improvement and addition are recommended.	To study on possible implementation of solar energy system.	X (Not included in this project)
2. QUARANTINE GREENHOUSES	To advice about design and construction of the quarantine greenhouse with necessary and sufficient isolating conditions, and to inspect its completion.	5	Construction was completed with some additional structures. Inspection of the system was satisfactory.	INIA should consider how to install the remaining isolating units.	X (Not included in this project)

I-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.  
(1) SURVEY AND COLLECTION

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF PROLONGATION	
					RATE	
1) RESEARCH ON STRATEGY OF COLLECTION	To do research on collecting strategy based on the analysis of collected materials, and to study appropriate collection method.	3	Collected specimens of some forage and historical small grain species have been investigated and helped by botanical collection records and botanists' recommendations, collection strategy was discussed.	Beans, maize or other collections will be analyzed in order to prepare plans for future collection.	X	No: self-sustainable.
2) DETERMINATION OF PRIORITY	Based on the analysis of natural and cultural conditions, to determine priorities of species and area to be collected.	3	Contact with a Japanese renowned expeditioner suggested the importance of ethnobotanical significance for some collection plan. This was realized by a fortunate coincidence of related parties.	Priority among agronomically important species will be analyzed.	X	No: self-sustainable.
3) SURVEY OF DISTRIBUTION	To survey areas not yet collected for important crop related species or those unique to Chile.	1	Contacts with experienced collectors were attempted.	Preliminary survey on limited genera or species may be considered.	O	Based on the published records, some survey will be necessary to establish methodology.
4) CLASSIFICATION OF COLLECTION	To identify distribution of genus and species of important genetic resources and classify collected materials.	2	Preliminary classification was attempted for collected forage species.	Tentative analysis on limited species may be of interest for future application.	Δ	Advice of botanists on herbarium samples are needed.
5) INTERNAL COLLECTION	To collect vegetable species, beans, potato and others for uncollected areas.	4	Collections of strawberry, beans, forage plants and other species were realized by eventual cooperation from abroad, USDA, CIAT, JICA mission and DSIR (NZ).	Collection according to the priority will be realized.	Δ	Collaboration with national collections by other groups than INIA will be necessary.
6) EXTERNAL COLLECTION	To supplement internal collections of important resources, to introduce or collect related species from neighboring countries.	2	Collaboration for Japanese international collections are discussed.	Contact for cooperation is needed. Analysis of the existing collection is a prerequisite.	O	At least one experience helped by Japanese mission will be very useful for future.
7) EXCHANGE OF COLLECTION	To introduce or exchange collections from or with other institutions to implement INIA collection.	4	Long-term duplicate conservation of collections from other genetic resource centers of neighboring countries has been discussed. National integration of genetic resources has been discussed.	Expeditions in strongly saline or extremely dry conditions will be organized.	X	No: self-sustainable.
8) EXPEDITIONS	To plan and realize expeditions of unutilized genetic resources for possible future use.	2	Literature survey of utilized plants in Chile has been advanced. Expeditions of underutilized small grains and forages are being organized.		O	Experiences of multi-species expedition on specific environments are needed.

I-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.  
 (2) MULTIPLICATION AND REGENERATION.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	RATE	NECESSITY AND BENEFIT OF PROLONGATION
1) MULTIPLICATION OF EXISTING RESOURCES	To multiply important genetic re- seed sources for long-term storage.	4	Soybean, common beans, rice, maize and a part of wheat were multiplied for collection.	Wheat, barley, oats, vegetables should be multiplied.	X	No: self-sustainable.
2) MULTIPLICATION OF COLLECTED RESOURCES	To multiply collected materials for characterization and long-term storage.	3	Introduced tomatoes were multiplied.	Bromus species and other collected materials should be multiplied.	X	No: self-sustainable.
3) PHYSIOLOGY OF SEED PRODUCTION	To do research on physiology of seed production to obtain good quality seed for long-term storage	1	No accountable activities yet.	Research on related national species is needed.	△	Literature survey or foreign research experiences will be helpful.
4) MAINTENANCE OF GENETIC CONSTITUTION	In order to prevent genetic shift of characteristics in seed multi- plication, to do research and pro- pose practical guidelines for seed multiplication of some species.	1	Some simulation studies were surveyed.	Systematic survey of literature and theo- retical analysis are remained.	○	Based on theoretical review, some simulation studies will be beneficial.

II-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.  
(3). PRESERVATION AND CONSERVATION.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF PROLONGATION	
					RATE	
1) ANALYSIS OF SEED LONGEVITY	To analyze physiological response of seed of indigenous species in order to find optimum storage conditions.	1	No accountable activities yet.	Seed longevity related to moisture contents may be analyzed.	△	Appropriate usage of seed dryers and containers will be discussed.
2) SEED AND VEGETATIVE PLANT CONSERVATION	To establish long-term seed storage for important agricultural species: (seed 24,000, plant 500)	4	Soybean(240), common beans(800), maize(800), forage(800), berries(50) have been stored as base collection. Active collection are to be arranged.	Much closer cooperation with crop programs is highly recommended.	×	No amount of realized collection is still small, but may be self-sustainable by the effort of INIA.
3) PHYSIOLOGY OF GERMINATION	To research conservation of recalcitrant seeds. To find means to rescue deteriorating seeds.	1	Germination tests of collected wild flower species has been initiated.	Germination tests will be continued and extended to other endemic species.	△	Literature survey or collaboration with flower or weed scientists will be helpful.
4) IN VITRO CONSERVATION	To establish long-term conservation of genetic resources using in vitro technique. (300 accessions)	4	Potato and sweet potato are registered and stored in vitro.	Some other fruits or vegetables are to be stored in vitro with the established technique.	×	No self-sustainable for routine species by the effort of INIA.
5) DEVELOPMENT OF LONG-TERM IN VITRO CONSERVATION TECHNIQUES	To find appropriate in vitro conservation techniques for some species.	2	Some vegetables or fruits species have been studied to find out appropriate storing conditions.	Research to find out a stable long-term storing condition for some important species is necessary.	○	Development and practical technique for garlic and other endemic species will be attempted.
6) RESEARCH ON REGENERATION TECHNIQUES FROM CULTURED MATERIALS	To develop regenerating technique for some species to establish long-term in vitro conservation.	2	Rapeseed, asparagus and others have been studied for plant regeneration from cultured conditions.	Research to find out a stable regenerating condition for some important species is necessary.	○	

I-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.  
(4) EVALUATION.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF PROLONGATION	
					RATE	
1) STANDARDIZATION OF EVALUATION METHODS	To establish consensus on the standardized evaluation process of characteristics for important crop species.	4	IBPGR minimum descriptors have been recommended for the evaluation of important agronomic species. International Research Centers also recommend further evaluation of recently developed characteristics.	To discuss and finalize if questions are raised on said standards.	X	No: self-sustainable.
2) EVALUATION OF EXISTING RESOURCES	To evaluate important part of INIA collection (17,000 accessions) by the standardized process.	4	900 accessions of maize have been evaluated by INIA standard. Beans, wheat, rice, barley, oats and other crop collections are being evaluated mainly by IBPGR standard with some modifications.	Evaluation by the standardized method will be continued on some important crops.	X	No: realized evaluation is still limited, but may be self-sustainable by the effort of INIA.
3) DEVELOPMENT OF EVALUATION TECHNIQUES	To develop a large scale evaluation technique in order to increase efficiency of genetic resources utilization.	2	Electrophoresis of seed protein has been applied for Beans and forages. Protein analysis technique for early selection of wheat breeding lines for baking quality was transferred.	Some efficient large scale evaluation techniques will be introduced and examined.	O	Newly developed biochemical and molecular techniques will be applied for characterization of collected resources.
4) DATA RECORDING AND MANAGEMENT	To establish data base of evaluated characteristics. Field data recording systems will be efficiently utilized.	2	Garlic data of INIA have been surveyed and a preliminary analysis is being discussed.	Maize data will be created as a data base. Some other crop data will be prepared as data base.	Δ	Field data recording systems will be introduced and tested.
5) DEVELOPMENT OF DATA PROCESSING TECHNIQUES FOR EVALUATION	To develop data processing techniques for more efficient evaluation and utilization of genetic resources.	2	An example of numerical classification of PCR has been displayed. Preliminary discussion is going on for the study of garlic data on this line. Analysis of collection in some crops will be very helpful for further application to others.	Appropriate use of numerical taxonomy is needed.	O	Preliminary study for the application of statistical analysis to help evaluation of genetic resources will be started.



I-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.  
(5) DATA REGISTRATION AND PROCESSING.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF PROLONGATION	
					RATE	
1) SURVEY AND USE OF EXISTING DATA	To search unpublished characteristic data and to augment their utility by publishing or data base creation.	4	Maize evaluation data were examined and adjusted. Garlic data are now examined and analyzed.	Data of other important crops will be searched and examined.	X	No: self-sustainable.
2) STANDARDIZATION OF DATA	To standardize genetic resources data in order to increase their utilization.	4	Some discussion over standardization of evaluation data has been centered on the use of IBPCR standard with minor modifications.	Discussion will be continued for other crop data.	X	No: self-sustainable.
3) DESIGN OF INFORMATION SYSTEM	To design and establish information management system for genetic resources data.	4	Information management system related to handling of passport data has been completed. The part related to inventory data is being prepared.	Inventory data management should be completed.	△	Migration of the system to the new INIA computing facilities will be watched carefully.
4) CREATION OF DATA BASE	To create data base of genetic resources using the system in 3).	4	A part of data was created as a data base and now available for retrieval and printing.	According to the change of computer system of INIA, all the data bases should be migrated later.	X	No: self-sustainable.
5) DATA INPUT	To input passport data of newly registered genetic resources and characteristic data.	4	Data input of common beans, soybeans, forages and maize is in progress. Data input is temporarily suspended to face with the system renovation.	Data of wheat, barley, oats, other beans, vegetables should be input.	X	No: self-sustainable.
6) PUBLICATION OF INDEX SEMINAR	To publish index seminar of INIA genetic resources.	1	Report writing sub programs were proposed and discussed.	Publication of index seminar will be very difficult affected by the change of INIA information system.	○	Continued supervision will be indispensable for information C/P in order to publish Index.
7) ESTABLISHMENT OF NATIONAL INFORMATION NETWORK	To establish national information network including INIA Experimental Stations and other institutions.	2	Contact and consultation with IBM and other companies are unsuccessful. Network formation of INIA Experimental Station through INTERNET university information system has been examined.	Union of bank information in INIA should be explored under the renovated information system.	○	Connection of INIA Exp. Stations and other collaborating organizations through a network is needed.
8) INTERNATIONAL EXCHANGE OF INFORMATION BY NETWORK	To establish international information network in order to exchange information among important genetic resources centers.	5	Preliminary contacts to international information networks or information service systems are successful in technical terms. On-line retrieval of GRIN (USDA RG information system) is now successful.	Administrative authorization of Japanese Genetic Resources Center for on-line retrieval is to be solicited.	△	Continued active relations and extension to other collaborating foreign organizations are necessary.

II - 2. ESTABLISHMENT OF QUARANTINE SYSTEM.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF PROLONGATION	
					RATE	
(1). SURVEY OF QUARANTINE SYSTEMS IN OTHER COUNTRIES FOR RESEARCH MATERIALS	To survey on quarantine systems for genetic resources in the important genetic resources centers of neighboring countries.	3	Quarantine systems of Japan and some neighboring countries and international research centers have been surveyed.	Related surveys and studies will be continued.	X	No: self-sustainable.
(2). ESTABLISHMENT OF QUARANTINE PROTOCOLS FOR RESEARCH MATERIALS	To establish protocols of inspection for bacteria, virus, nematodes, etc for introduced research materials.	3	Some example for virus detection procedure has been analysed.	Preliminary protocols related to introduced materials will be established.	X	No: self-sustainable.
(3). CONFORMATION WITH NATIONAL QUARANTINE REGULATIONS	To adjust these protocols in conformation with the national quarantine regulations.	3	Exchange of information and opinion between INIA & SAG is in advance. Legal arrangement has been cleared.	Above protocols will be examined and authorized by national quarantine system of SAG.	X	No: self-sustainable.
(4). ESTABLISHMENT OF NATIONAL QUARANTINE SYSTEM FOR RESEARCH MATERIALS	To establish national quarantine system proper to the introduced genetic resources of INIA.	3	Exchange of information and opinion between INIA & SAG is in advance. Legal arrangements has been cleared. And related situations in Japan have been transferred.	Introduction of related information from abroad and accumulation of own experience will improve the system.	Δ	Continued visit of Japanese experts and training of Chilean counterparts in Japan will advance the analysis.
(5). DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR DETECTION AND THERAPY	To develop advanced techniques for detection, identification and therapy of unexpected pathogens and insects.	2	Necessary equipments are prepared. Technology transfer is starting.	Transfer of technology in this field should be continued and deepened.	○	Identification technique for new pathogens by electron microscope and molecular immunology will be attained.

I-3. UTILIZATION OF GENETIC RESOURCES INCLUDING BIOTECHNOLOGY.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	NECESSITY AND BENEFIT OF	
					RATE	PROLONGATION
(1) UTILIZATION OF RESOURCES BY CONVENTIONAL TECHNIQUES	To utilize genetic resources of vegetables, fruits, oil crops and others by conventional breeding techniques.	3	Breeding plans for grape, rape, garlic and asparagus are proposed depending upon advice of each crop expert.	Measures to improve the breeding program of fruits, vegetables and others will be taken.	X	No: may be self-sustainable.
(2) RESEARCH OF RESOURCES BY CELL ENGINEERING TECHNIQUES	To develop efficient use of genetic resources by various cell engineering techniques.	2	Haploid breeding techniques of rape, embryo rescue of seedless grapes and mass propagation by in vitro culture of asparagus and garlic has been applied.	Transfer of further breeding technologies relating to cell engineering for main crops is programmed.	O	Garlic mass-propagation technique and other once transferred techniques should be studied further.
(3) RESEARCH OF RESOURCES BY GENETIC ENGINEERING TECHNIQUES	To augment efficiency of genetic resources utilization by technology transfer in the field of genetic engineering.	1	Necessary equipments and installation have been arranged. A competent scientist has been newly adopted and assigned for this line of research.	Introduction and adaptation of techniques and materials are to be resumed.	O	Study for the application of genetic engineering of virus coat protein to breed resistant potato and melon plants is programmed.

III. EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS.

ITEM	FINAL GOAL	SCORE	PRESENT STATUS AND ATTAINMENT	REMAINED ACTIVITIES	RATE	NECESSITY AND BENEFIT OF PROLONGATION
1. PREPARATION OF MANUALS	To prepare manuals for genetic resources management and utilization with various specialities in a series.	3	A manual for chromosome observation of various important crop species has been compiled.	Preliminary manuals for genetic resources management will be prepared.	Δ	Continued consultation may be helpful.
2. SEMINARS, CONFERENCES AND MEETINGS	To hold meeting of related specialists and national/international seminars to exchange information.	4	A national seminar to discuss Rules for PGR management on national level with international advising group is successfully realized. A recommendation to organize a National Committee for GR of Chile was prepared and will be presented for the Minister of Agriculture very soon.	A cooperation for the international seminar on genetic resource management and national policy was asked for from Austral University.	Δ	Continued consultation and cooperation may be helpful.
3. PUBLICATIONS	To publish and distribute pamphlets, manuals, proceedings, index seminar, data book of characteristics, etc.	3	The significance and activities of genetic resource conservation project was published in a colored pamphlet. Maize evaluation data were prepared in a specially designed data book. A standard of management for national GR was published.	Genetic evaluation data will be published. Index seminar will be prepared for printing.	Δ	Continued consultation and cooperation may be helpful.
4. SHORT TERM COURSES	To hold a short training course for national/international participation in order to transfer genetic resources management techniques.	3	An application for the 5 year seminar plan was accepted by JICA HDQ.	A visit of Preparatory Mission is scheduled.	Δ	5 year plan for international seminar will be discussed and be prepared to start in 1984.
5. INTERNATIONAL EXCHANGE OF GENETIC RESOURCES INFORMATION AND BREEDING MATERIALS	To exchange genetic resources information, literature, breeding materials and other research materials.	4	Multilateral exchange of genetic resources information has been attained with neighboring countries and international research centers by visits, invitations and communications. Bilateral exchange of genetic resources has also been noted.	To follow the result of a recommendation of national seminar to the Minister of Agriculture.	Δ	To form a National committee of PGR Management to integrate national rule for the management and exchange of PGR.

PROGRESS OF THE ACTIVITIES

ITEM	CATEGORY OF ATTAINMENT					NECESSITY OF PRO- LONGATION
	5	4	3	2	1	
<b>I. CONSTRUCTION OF THE BASE BANK, ACTIVE BANKS AND OTHER FACILITIES</b>						
1. SEED STORAGE	○					x
2. QUARANTINE GREENHOUSES	○					x
<b>II. GENETIC RESOURCES PROGRAM</b>						
<b>1. GENETIC RESOURCES MANAGEMENT AND RESEARCH</b>						
<b>(1) SURVEY AND COLLECTION</b>						
1) RESEARCH ON STRATEGY OF COLLECTION			○			x
2) DETERMINATION OF PRIORITY			○			x
3) SURVEY OF DISTRIBUTION					○	○
4) CLASSIFICATION OF COLLECTION				○		△
5) INTERNAL COLLECTION	○					△
6) EXTERNAL COLLECTION				○		○
7) EXCHANGE OF COLLECTION	○					x
8) EXPEDITIONS				○		○
<b>(2) MULTIPLICATION AND REGENERATION.</b>						
1) MULTIPLICATION OF EXISTING RESOURCES	○					x
2) MULTIPLICATION OF COLLECTED RESOURCES			○			x
3) PHYSIOLOGY OF SEED PRODUCTION					○	△
4) MAINTENANCE OF GENETIC CONSTITUTION					○	○
<b>(3) PRESERVATION AND CONSERVATION</b>						
1) ANALYSIS OF SEED LONGEVITY					○	△
2) SEED AND VEGETATIVE PLANT CONSERVATION	○					x
3) PHYSIOLOGY OF GERMINATION					○	△
4) IN VITRO CONSERVATION	○					x
5) DEVELOPMENT OF LONG-TERM IN VITRO CONSERVATION TECHNIQUES				○		○
6) RESEARCH ON REGENERATION TECHNIQUES FROM CULTURED MATERIALS				○		○
<b>(4) EVALUATION</b>						
1) STANDARDIZATION OF EVALUATION METHODS	○					x
2) EVALUATION OF EXISTING RESOURCES	○					x
3) DEVELOPMENT OF EVALUATION TECHNIQUES				○		○
4) DATA RECORDING AND MANAGEMENT				○		△
5) DEVELOPMENT OF DATA PROCESSING TECHNIQUES FOR EVALUATION				○		○
<b>(5) DATA REGISTRATION AND PROCESSING</b>						
1) SURVEY AND USE OF EXISTING DATA	○					x
2) STANDARDIZATION OF DATA	○					x
3) DESIGN OF INFORMATION SYSTEM	○					△
4) CREATION OF DATA BASE	○					x
5) DATA INPUT	○					x
6) PUBLICATION OF INDEX SEMINUM					○	○
7) ESTABLISHMENT OF NATIONAL INFORMATION NETWORK				○		○
8) INTERNATIONAL EXCHANGE OF INFORMATION BY NETWORK	○					△
<b>2. ESTABLISHMENT OF QUARANTINE SYSTEM</b>						
(1) SURVEY OF QUARANTINE SYSTEMS IN OTHER COUNTRIES FOR RESEARCH MATERIALS			○			x
(2) ESTABLISHMENT OF QUARANTINE PROTOCOLS FOR RESEARCH MATERIALS			○			x
(3) CONFORMANCE WITH NATIONAL QUARANTINE REGULATIONS			○			x
(4) ESTABLISHMENT OF A NATIONAL QUARANTINE SYSTEM FOR RESEARCH MATERIAL			○			△
(5) DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR DETECTION AND THERAPY				○		○
<b>3. UTILIZATION OF GENETIC RESOURCES INCLUDING BIOTECHNOLOGY</b>						
(1) UTILIZATION OF RESOURCES BY CONVENTIONAL TECHNIQUES			○			x
(2) RESEARCH OF RESOURCES BY CELL ENGINEERING TECHNIQUES				○		○
(3) RESEARCH OF RESOURCES BY GENETIC ENGINEERING TECHNIQUES					○	○
<b>III. EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS</b>						
1. PREPARATION OF MANUALS			○			△
2. SEMINARS, CONFERENCES AND MEETINGS		○				△
3. PUBLICATIONS			○			△
4. SHORT TERM COURSES			○			△
5. INTERNATIONAL EXCHANGE OF GENETIC RESOURCES INFORMATION AND BREEDING MATERIALS		○				△

\* CATEGORY OF ATTAINMENT: 5:100%, 4:75%, 3:50%, 2:25%, 1:0%  
NECESSITY OF PROLONGATION: ○:NECESSARY, ×:UNNECESSARY, △:PARTIAL COOPERATION NECESSARY

Annex 9 : Progress of Activities Submitted by Chilean Counterparts

INSTITUTO DE INVESTIGACIONES AGROPECUARIAS

PROPOSAL FOR THE EXTENSION OF THE JICA-INIA PROJECT  
CONSERVATION OF GENETIC RESOURCES

SANTIAGO DE CHILE

May, 1993

OUTLINE OF A PROPOSAL FOR PROLONGATION OF THE JICA-INIA  
PROJECT "CONSERVATION OF GENETIC-RESOURCES"

1. BACKGROUND.

1.1. OBJECTIVES OF THE PRESENT PROJECT.

The Project "Conservation of Genetic Resources", which the Agricultural Research Institute "INIA" is developing with the cooperation of the Japanese International Cooperation Agency, was signed considering three main objectives:

- a. To contribute, in a systematic, permanent and rational way, to the exploration, collection, preservation, characterization, documentation and distribution of the plant genetic resources of Chile.

For this purpose a germplasm base bank was established at the Vicuña Experiment Substation (Vicuña) and active banks, at the Experiment Stations of La Platina (Santiago), Quillamapu (Chillán) and Carillanca (Temuco).

- b. To contribute to the maintenance of the Chilean agricultural health, by introducing exotic plant genetic resources to the country using techniques to reduce the risks of introducing new pest and diseases to a minimum.

For this purpose a phytopathology laboratory, quarantine greenhouses and an electron microscopy laboratory were established at La Platina Experiment Station (Santiago).

- c. To contribute to the best use of the plant genetic resources of the country, developing the capacity to incorporate new biological technologies to the traditional procedures for the creation of new variety.

For this purpose an agronomic biotechnology laboratory was established.

These objectives have defined the three components that this project presents:

- Conservation
- Quarantine, and
- Biotechnology

The overall objective of the Project is to contribute in the creation of National Programs for Genetic Resources and Agronomic Biotechnology in INIA, including a better post-entry quarantine system for the introduction of experimental germplasm to the country.

## 1.2. DURATION OF THE PROJECT.

This Project was signed under a 5 year plan. It started in January 1989 and will end in December 1993.

## 1.3. ADVANCES OF THE PROJECT COMPONENTS UP TO JULY 1993.

### A. CONSERVATION.

Construction of buildings and installation of laboratories.

The construction of buildings and installation of the laboratories were accomplished within the time schedule determined in the Tentative Schedule of Implementations (TSI).

Base bank: Construction ended on schedule on March 1990.

Active Banks: Construction ended on schedule on November 1990.

#### Appointment of Staff

The following staff has been appointed to the project.

- Base Bank	1	curator (researcher)
	1	laboratory assistant
- La Platina active bank	1	curator (researcher)
	1	research assistant
- Quillamapu active bank	1	part-time researcher
- Carillanca active bank	1	researcher
	1	part-time research assistant

Research activities.

The research activities on conservation started in 1990.

Significant advances were obtained in the following lines of



work, established in the TSI.

- Survey and collection: The general collection strategies were defined and priorities were determined for germplasm exchange.
- Multiplication and regeneration: A multiplication plan of the existing germplasm was achieved but not of the newly collected germplasm.
- Preservation and conservation: Conservation methods for seeds, vegetative and *in vitro* materials were established for the main species which INIA has usually maintained.
- Evaluation: Standardization of evaluation methods and evaluation of the existing germplasm were attained.
- Data registration and processing: Existing data were identified and standardized. A data base was created and data input started.

Partial advances were performed in the following lines of work established in the TSI.

- Survey and collection: Classification of the collection was partially done. Three domestic collections were performed.
- Preservation and conservation: The analysis of seed longevity was initiated.
- Evaluation: Data taking and management was started.
- Data registration and processing: An information system was designed for information exchange through international networks.

Advances were not achieved in the following lines.

- Survey and collection: Collections or expeditions abroad were performed.
- Multiplication and regeneration: Studies of the physiology of seed production was not approached.
- Preservation and conservation: Some problems were encountered in the analysis of seed viability and the physiology of germination has not been approached yet.
- Data registration and processing: No *Index Seminum* will be published.

## B. QUARANTINE.

### Construction of the building and installation of laboratories.

The construction of the building and the installation of laboratories were accomplished within the period established in the TSI.

Quarantine laboratory and greenhouses: The construction ended in March 1992, suffering a delay of only two months.

Electron microscope laboratory: The arrangement of facilities finished at the beginning of the 5th year (March of 1993).

### Assignment of personnel.

The assignment of personnel for running the of quarantine has been partly accomplished:

- Quarantine                    1        research assistant

### Research activities.

Activities on quarantine research was initiated just at the beginning of 1993.

Significant advances were observed in the following lines of work established in the TSI:

- Survey of quarantine systems in other countries: Quarantine systems of the following countries were studied. Japan (MAFF, NIAR, FTRS), Brazil (EMBRAPA, COPERÇUCAR), Costa Rica (CATIE), Colombia (CIAT) and Mexico (CIMMYT).
- Establishment of quarantine protocols for experimental materials: A general protocol for germplasm introduction to INIA was formulated.
- Conformity of INIA is system to the Chilean legislation on the subject: An agreement for the introduction and quarantine for experimental materials was established between INIA and SAG. (Plant Quarantine authority of Chile).

Advances on the following lines of the work were partially achieved:

- Establishment of a national system of quarantine of experimental materials: An introduction of tomato seeds from Paraguay was done to test the system.

No advances were registered on the following lines:

- Development of advanced techniques for the detection and therapy of quarantine problems during germplasm introduction.

### C. BIOTECHNOLOGY.

**Construction of buildings and installation of laboratories.**

The installation of laboratories was accomplished within the period established in the TSI.

Biotechnology Laboratory: A facility was established during the first 3 months of activities of the project (1990). Now facilities are being enlarged and will be finished before the end of the Project.

**Assignment of personnel.**

The assignment of personnel was completely finished:

- |                            |   |             |         |
|----------------------------|---|-------------|---------|
| - Laboratory in La Platina | 3 | researchers |         |
|                            | 2 | research    | assist- |
|                            |   | ants        |         |

**Research activities.**

The research activities for utilization of the germplasm started in 1989.

Significant advances were recorded in the following lines of the work established in the TSI.

- Utilization of genetic resources by conventional methods: Breeding programs were analyzed and strengthened for rice, oats, barley, forages, common beans, fruit crops, vegetables crops, rapeseed and wheat.

Advances were partially attained for the following lines of the work established in the TSI.

- Development of micropropagation and tissue culture techniques: Culture techniques for garlic, asparagus, rapeseed and grapes were developed.
  
- development of biochemical techniques: Protein analysis by electrophoresis were developed for wheat, *Bromus*, common beans and other dry beans.

No advances were made on the following lines:

- Research on molecular genetics techniques.

#### D. GENERAL ACTIVITIES.

Advances in preparation of publications, seminars and germ-plasm exchange to and from Japan were done.

Three offices have been assigned for housing long and short term experts at La Platina Experiment Station.

The following support staff was also assigned:

- La Platina                    1      Full time secretary
- 1      Full time driver.

#### 2. REASONS TO PROLONG THIS PROJECT.

A delay in the start of the lines of work, lateness to achieve the first actions, evolution in the objectives and techniques considered at the beginning of the Project, and institutional changes which INIA has experienced resulted in the fact that the objectives established in the TSI have not been sufficiently accomplished. The necessity to satisfy these objectives justify an extension of this Project.

A brief analysis of the principal causes which prevented the accomplishment of the initial objectives will follow.

##### 2.1. DELAY IN THE START OF THE LINES OF WORK.

Before work could start construction of building, installation of laboratories and equipments should be installed. The first two activities were responsibility of INIA and the donation of equipments was the responsibility of JICA.

**A. CONSTRUCTION OF BUILDINGS AND INSTALLATION OF LABORATORIES.**

There was no delay in the construction of the buildings. The installation of the laboratories was somewhat late, but this delay was not critical to the development of the Project.

## B. RECEIPT AND INSTALLATION OF EQUIPMENTS.

The arrival of some of the equipments and their installation suffered delays which affected the development of the Project.

**Biotechnology laboratory:** Equipments for biotechnology arrived during 1991 and 1992. Equipments to be used for molecular genetics and plant genetic transformation have not arrived yet and will possibly be utilized at the final stage of the Project.

**Base bank:** The installation of refrigerators and air-conditioners was delayed by 4 months, so they start functioning just at the beginning of July 1991. The seed dryer has not been installed at present, but will be before the end of the Project. This equipment is essential for the long-term seed storage.

**Active banks:** The installation of the refrigerators and air-conditioners was delayed several months, they start its functioning at La Platina Experiment Station in October 1991, in Carillanca Experiment Station in December 1991, and in Quillamapu Experiment Station in March 1992. The seed dryers have not arrived yet, but should arrive before the end of the Project. These equipments are crucial for Carillanca and Quillamapu for medium-term seed storage.

**Laboratory and greenhouses of quarantine:** The installations of the equipments finished in the 4<sup>th</sup> and 5<sup>th</sup> year of the Project (1992 and 1993) according to the program, and are now functioning perfectly, however, their utilization has been limited to only one introduction of tomato seeds from Paraguay.

**Electron Microscope laboratory:** The equipments arrived and are now being installed. These equipments are essential to supplement the quarantine work. The knowledge for utilization of these equipments is limited at this time.

## 2.2. LATENESS OF ACTIONS IN THE EARLY STAGE.

The actions of the Project developed slowly during the early years due to some of INIA reasons and also to reasons outside of INIA.

### A. CAUSES ATTRIBUTABLE TO INIA.

The three areas of the Project (conservation, quarantine and biotechnology) were activities unknown to the INIA, although they appeared to be intuitively very important. All new ideas are accepted with a certain degree of hesitation by any human society. This also occurred with the researchers of INIA, who

were related to the Project as counterparts in specific areas of investigation. However, the development of the Project succeeded in demonstrating the importance of the three fields, and consequently, these hesitations are totally overcome at present. All the scientific community of INIA now recognize that the genetic resources must acquire a more relevant role in the reconversion and modernization of the Chilean agriculture.

The development of the Project required an adequation of the operational system of INIA in relation to staff and budget assignment. This adequation is not an easy process specially staff assignment.

A change of priorities in the national policy related to agriculture occurred during 1990 as a consequence of the change of government. This induced some degree of confusion related to the relevance of this Project during 1990 and 1991. This situation is totally overcome now. At present genetic resources, their introduction through modern quarantine technique and their utilization applying biotechnology looked are subjects with the highest priority for the Chilean agriculture, and consequently for INIA.

Finally, INIA also suffered a budget imbalance, which resulted in a reduction and restructuring of its personnel. This induced a delay in assigning personnel to the different components of the Project.

For these reasons many activities have developed later than expected, did not started on time or insufficient personnel was assigned.

#### B. CAUSES ATTRIBUTABLE TO ELEMENTS OUTSIDE OF INIA.

The approval of the agreement of INIA and SAG to authorize the legal functioning of the quarantine facilities at La Platina Experiment Station has delayed the starting of quarantine activities.

The delay in the beginning of the BID II Institutional Development Plan, which had been considered as a basic financial element of this Project, is the principal reason for the lack of personnel and budget assignment.

#### 2.3. EVOLUTION OF THE OBJECTIVES AND TECHNIQUES CONSIDERED AT THE BEGINNING OF THE PROJECT.

The Project was initially considered to concentrate particularly on the genetic resources presently maintained and inves-

tigated by INIA. The development of the Project has demonstrated the great potential value that other plant genetic resources existing in Chile represent. This fact has induced INIA and its Genetic Resource Program to consider the extension of the range of its responsibility. A great proportion (approximately 45%) of the Chilean plant genetic resources are original and endemic to the country, for which a first-hand knowledge related to preservation, evaluation and utilization should be developed.

#### 2.4. CHANGES WHICH INIA HAS SUFFERED AS THE INSTITUTION.

INIA has suffered some changes which have affected the Project during the past 4 years. This is the case of its computing system. The Project has developed a computerized database to be used in a IBM 9370 system available in every Experiment Station of INIA. However, the Institute considered necessary to replace this system by a new one consisting of personal computers connected in a Local Area Network all Experiment Stations. This system will be implemented with on the BID II Institutional Development Plan. The change of computational system was decided in 1992, but the specific form that will have the new system has not been determined. This implies that the development of the database and depended activities be delayed and confronted with its migration to the new system.

#### 3. GOALS TO BE ACHIEVED BY THE PROJECT PROLONGATION.

##### 3.1. GENERAL GOAL.

It should be reminded that the final objective of INIA's activities is to contribute to the development, reconversion and sustainment of Chilean agriculture by the creation, adaptation and transfer of technologies.

On the other hand, the objectives of the JICA-INIA Project are the conservation, quarantine and utilization of genetic resources incorporating biotechnologies to the traditional breeding methods. These objectives are coincident with those of the Institute as they will contribute in acquiring germ-plasm through collection and introduction under a safe quarantine system, in conserving, characterizing, evaluating and finally utilize them more efficiently by the application of new biotechnological techniques. All these efforts are to obtain new varieties, for the final goal, which should satisfy regional and national objectives to develop, reconverse and sustain the Chilean agricultural system.

From this point of view the objectives of the JICA-INIA Project is of principal importance for INIA and our National



Agriculture. These objectives started to establish slowly at the beginning of the Project, and recently are acquiring a rhythm which allow us to foresee future stability. An interruption of the Project at this moment can result in a serious disincentive, for both researchers and INIA-authorities.

For these reasons, it seems logical to maintain the activities in all three components. In this way, the Project will achieved the following general objective in its final stage.

To create conditions in INIA that allow the development of sustainable activities in the conservation, the quarantine and the biotechnological utilization of plant genetic resources.

### 3.2. SPECIFIC GOALS.

The extension of the Project is intended concentrate in specific activities of the three components in which no significant advances were accomplished as established in the initial TSI.

#### A. CONSERVATION.

Help is indispensable in the following lines of research.

- Survey and collection: Survey of distribution, external collections and expeditions, with emphasis on native or naturalized materials.
- Multiplication and regeneration: Maintenance of genetic constitution.
- Preservation and conservation: Development of a long-term *in vitro* preservation technique and regeneration from *in vitro* cultured plant material.
- Evaluation: Development of a massive evaluation and data processing technique for genetic resources evaluation.
- Data registration and processing: Publication of an *Index Seminum* and establishment of a national system for information exchange.

Partial Help is needed in the following lines of research.

- Survey and collection: Classification of collected materials, domestic collection, external collection, organization of expeditions with emphasis on native and naturalized materials.
- Multiplication and regeneration: Physiology of seed production with emphasis on native and naturalized materials.
- Preservation and conservation: Analysis of seed longevity and germination physiology with emphasis on native and naturalized materials.
- Evaluation: Electronic data acquisition and management.
- Data Registration and processing: Design of information system and exchange of information through national and international networks.

#### B. QUARANTINE.

Help is indispensable in the following lines of research.

- Development of advanced techniques for the detection of diseases and their therapy in introduced experimental plant material.

Partial help is needed in the following lines of research.

- Establishment of a national system of quarantine for the introduced experimental materials.

#### C. BIOTECHNOLOGY.

It is proposed that the activities to be performed in the field of agronomic biotechnology will be considered only well established and well developed techniques which INIA will use to benefit the various breeding programs. It will not consider the development of biotechnologies which need innovative expansion. These technologies will be handed to other institutions of the country and, as a consequence, INIA will stay away from competition with advanced laboratories.

Help is indispensable in the following lines of research.

- Cell engineering techniques for utilization of genetic resources.

- Genetic engineering techniques for utilization of genetic resources.

#### 4. LENGTH OF EXTENSION.

A 3 year extension is estimated as a period when satisfactory results could be obtained for all expected objectives.

#### 5. ASPECTS TO BE CONSIDERED FOR THE EXTENSION.

##### 5.1. EQUIPMENTS.

Up to now, most equipments to satisfy the requirements of all areas of the Project have been donated. For this reason, the extension of the Project propose the acquisition of equipments which cover the following criteria:

- Renovation of the existing equipments including back-ups and accessories.
- Donation of new laboratory equipment for implementing those newly developed techniques, and for Experiment Stations not included in the initial Project.
- New equipment only in those cases where new technology developments requires it or in cases in which the new equipment in result in an increase of efficiency in the already proposed work.

The definitive list will be elaborated according to the approved objectives.

##### 5.2. LONG-TERM EXPERTS.

The cultural differences and the language barriers of the Japanese and Chilean participants may cause important problems which interfere with the success of the Project. Fortunately the present long-term experts have perfectly understood the Chilean's mentality, which has greatly reduced this problem. An extension of 3 years has been proposed, which is a short time for new experts to get acquainted with the project and the Chilean mentality. For this reason, it is suggested that not only the leader but also the coordinator of the Project should be maintained in order to guarantee the continuity of the Project so the quality and quantity of the work to be assumed may not be affected.

### 5.3. SHORT-TERM EXPERTS.

In general 4 to 5 experts for the extension period are required.

#### A. CONSERVATION.

Depending on the objectives to be attained, at least cooperation of 1 short-term expert per year is requested.

#### B. QUARANTINE.

Depending on the objectives to be attained, at least cooperation of 1 short-term expert per year is requested.

#### C. BIOTECHNOLOGY.

Depending on the objectives to be attained, at least cooperation of 2 short-term experts per year is requested.

### 5.4. TRAINING.

The necessity of 4 to 5 scholarships per year for the extension is estimated. The following fields are tentatively proposed.

#### A. CONSERVATION.

Depending on the objectives to be attained, at least 1 training per year is requested.

#### B. QUARANTINE.

Depending on the objectives to be attained, at least 1 training per year is requested.

#### C. BIOTECHNOLOGY.

Depending on the objectives to be attained, at least 2 training per year are requested.

### 6. ELEMENTS OF COUNTERPART OFFERED BY INIA.

#### 6.1. PERSONNEL.

Two types of personnel will continue to cooperate with the Project: Personnel directly assigned to the Project and counterparts for specific fields of research.

**A. PERSONNEL DIRECTLY ASSIGNED TO THE PROJECT.**

The Personnel directly assigned to the Project will be composed of the presently existing personnel and the additional ones which will be incorporated as shown below. The following additional personnel will be assigned.

**Conservation.**

- Base bank	1	research assistant
- Quillamapu active bank	1	full-time researcher
	1	research assistant
- Carillanca active bank	1	full-time research assistant

**Quarantine.**

The La Platina Experiment Station will officialize the assignment of a quarantine researcher duly responsible.

**B. COUNTERPART PERSONNEL FOR SPECIFIC RESEARCH FIELDS.**

Will include specialists in plant breeding, phytopathology, entomology, biochemistry, computing and biometry, who will be defined in conformity with the objectives to be decided.

**6.2. BUDGET.**

The budget presently assigned for the activities of the Project will be maintained.

Annex 10 : Data of Activities Submitted by the Project

Table 1. GERMPLOSH COLLECTIONS AND INTRODUCTIONS FROM 1989 TO 1993

Year	Exploration and Collection	Collections from other Internal Organizations	Introductions from External Organizations	Introductions by Exchange	Total
before 1988		50			50
1989		50	1		51
1990	1250	100	33	14	1397
1991	58	10150	11	5	10224
1992	939	22512	137	58	23546
1993 (Up to June)	60	8000	42		8102
Total	2307	40862	224	77	43470

Annex 10 : Data of Activities Submitted by the Project

Table 2. EXPLORATION AND COLLECTION ACCORDING TO CROPS

Year	Strawberry	Beans	Forage Plants	Potatoes	Others	Total
before 1988						0
1989						0
1990		1250				1250
1991	58					58
1992	62		513	65	299	939
1993 (Up to June)					60	60
Total	120	1250	513	65	359	2307

Annex 10 : Data of Activities Submitted by the Project

Table 3. COLLECTIONS ACCORDING TO CROPS FROM OTHER INTERNAL ORGANIZATIONS

Crops	before 1988	1989	1990	1991	1992	1993 (up to June)	Total
Potatoes	50	50	100	50			250
Sweet Potatoes				50	50		100
Maize				600	1200		1800
Common Bean				1200	600		1800
Lentil					2200		2200
Chickpea					2800		2800
Vegetables					1500		1500
Wheat				8000	8000	8000	24000
Barley					500		500
Oats					150		150
Forage Crops					1700		1700
Rice					1800		1800
Peas					1300		1300
Rape seed					200		200
Soybean				250			250
Berries					62		62
Others					450		450
<b>Total</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>10150</b>	<b>22512</b>	<b>8000</b>	<b>40862</b>

Annex 10 : Data of the Activities Submitted by the Project

Table 4. INTRODUCTION ACCORDING TO CROPS FROM EXTERNAL ORGANIZATIONS

Crop Year	Garlic	Fruit Tree	Forage Plants	Vegeta- bles	Oil Crops	Total
before 1988						
1989	1(1)					1
1990	1(2)	3(3)	19(4)	2(2)	8(5)	33
1991		11(3)				11
1992				46(6,7,8) 45(6) 46		137
1993 (Up to June)				42(9)		42
Total	2	14	19	181	8	224

- (1) Nagasaki Agr. Exp. Sta., Japan  
(2) Saga A.E.S., Japan  
(3) Fruit Tree Res. Sta., Japan : 3 Plums and 11 Persimons  
(4) Nat. Grassland Res. Inst., Japan  
(5) Chugoku Nat. A.E.S., Japan  
(6) Takú Seed Co., Japan  
(7) Nat. Ins. Vegetables, Ornamental Plants and Tea, Japan  
(8) Chiba A.E.S., Japan  
(9) CETAPAR, Paraguay



Annex 10 : Data of Activities Submitted by the Project

Table 5. COLLECTIONS BY EXCHANGE WITH OTHER ORGANIZATIONS

Crop	Grapes	Straw- berry	Maize	Total
Year				
before 1988				
1989				
1990	14(1)			14
1991		5(2)		5
1992			58(3)	58
1993 (Up to June)				
Total	14	5	58	77

(1) Fukuoka A.E.S., Japan

(2) Nat. Inst. Vegetables, Ornamental Plants and Tea, Japan

(3) Hokkaido Pref. Plant Genetic Research Center, Japan

Annex 10 : Data of Activities Submitted by the Project

Table 6. MULTIPLICATION OF EXISTING AND COLLECTED RESOURCES FROM 1989 TO 1993

Year	No. of Accessions		
	Existing	Collected	Total
before 1988			0
1989	650		650
1990	750		750
1991	8450		8450
1992	3200		3200
1993 (Up to July)	100	150	250
Total	13150	150	13300

Guilamapu multiplied 8000 wheat entries in 1991, but the harvest was damaged by insect infestation. 2000 entries were multiplied again in 1992.

Carillanca multiplied 8000 wheat entries in 1991.

Annex 10 : Data of Activities Submitted by the Project

Table 7. MULTIPLICATION OF EXISTING AND COLLECTED RESOURCES ACCORDING TO CROPS

Crop	No. of Accessions		
	Existing	Collected	Total
Soybean			0
Common Beans	850		850
Rice	1000		1000
Maize	1300		1300
Wheat	10000		10000
Barley			
Oats			
Vegetables			
Others		150	150
<b>Total</b>	<b>13150</b>	<b>150</b>	<b>13300</b>

Annex 10 : Data of Activities Submitted by the Project

Table 8. SEED AND VEGETATIVE PLANT CONSERVATION FROM 1989 TO 1993

Year	Base Bank	Active Banks			Active Bank Total
		La Platina	Quilamapu	Carillanca	
before 1988		50			50
1989		50			50
1990		100			100
1991		100			100
1992	1462	5450	14050	18750	32250
1993 (Up to July)		8000			8000
<b>Total</b>	<b>1462</b>	<b>13750</b>	<b>14050</b>	<b>12750</b>	<b>40550</b>

## Annex 10 : Data of Activities Submitted by the Project

Table 10. IN VITRO CONSERVATION

Crop Year	Potato	Sweet Potato	Total
before 1988	50		50
1989	50		50
1990	100		100
1991	50	50	100
1992		50	50
1993 (Up to July)			
Total	250	100	350

## Annex 10 : Data of Activities Submitted by the Project

Table 9. SEED CONSERVATION ACCORDING TO CROPS

Crop	Base	Active Banks			Total
	Bank	La Platina	Quilamapu	Carillanca	
Soybean	250				0
Common beans		600	1200		1800
Maize	600	1800			1800
Forages	500			1700	1700
Berries	62				0
Lentil		600	1200	400	2200
Chickpea		800	1200	800	2800
Vegetables		1500			1500
Wheat		8000	8000	8000	24000
Barley				500	500
Oats				150	150
Rice			1800		1800
Pea			500	800	1300
Rapeseed				200	200
Others	50	100	150	200	450
Total	1462	13400	14050	12750	40200

Annex 10 : Data of Activities Submitted by the Project

Table 11. CHARACTERIZATION / EVALUATION OF EXISTING RESOURCES

Year	Maize	Beans	Wheat	Rice	Others*	Total
before 1988	400				80	480
1989	400				80	480
1990		400			120	520
1991		600			120	720
1992						0
1993 (Up to June)	100		2000	100		2200
Total	900	1000	2000	100	120	4120
No. of Total Accessions	1800	1800	24000	1800	120	29520
Rate of Completion (%)	50,00	55,56	8,33	5,56	100,00	13,96

\* Repeated evaluation of the garlic collection

Annex 10 : Data of Activities Submitted by the Project

Table 12. PASSPORT DATA IN THE DATA BASE

Year	Common Beans	Soybean	Forages	Maize	Others	Total
before						
1988						0
1989						0
1990						0
1991						0
1992	1263	239	444	1655	5	3606
1993 (Up to June)			262		62	324
Total	1263	239	706	1655	67	3930

Annex 10. Data of Activities Submitted by the Project

Table 13. DISTRIBUTION OF GERMFLASM

Year	International	Total
before		
1988	0	
1989		
1990	21 (Grape)	
1991	18 (Strawberry) 2 (Garlic) 60 (Maize) 40 (White Potato)	
1992	10 (Rice, Wheat, Barley, Beans) 20 (Sweet Potato)	
1993 (Up to June)	0	
Total	171	

Annex 10 : Data of Activities Submitted by the Project

EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS

1. Preparation of Manuals

- 1) The Manual for Chromosome Observation (1992)
- 2) A User's Manual for Genetic Resource Information Management of INIA (1993)

2. The number of Times of Seminars and Meetings

Year	Seminars	Internal Meetings	Joint Meetings
1989		1 (INIA G.R. Leader conf.)	2 (Joint Committee Meeting)
1990	1 (Base Bank)	1 (INIA G.R. Coordinator conf.)	2 (Joint Committee Meeting)
1991		1 (INIA G.R. Coordinator conf.) 2 (INIA G.R. Committee)	1 (Joint Committee Meeting)
1992	1 (National G.R. System)	1 (INIA G.R. Coordinator conf.) 2 (INIA G.R. Committee)	1 (Joint Committee Meeting)
1993 (Up to July)			
Total	2	8	6

### 3. Publications

- 1) A colored booklet on the significance and activities of genetic resources conservation project (June 1990)
- 2) A data book of maize evaluation (1990)
- 3) A standard of management for national GR (October 1992)
- 4) A data book of garlic evaluation (in preparation)
- 5) A colored booklet on the significance and activities of plant quarantine system of INIA (June 1993)
- 6) A recommendation of National Plant Genetic Committee of Chile for the Minister of Agriculture (July 1993)
- 7) Novedades Biotecnológicas (57 issues, every 2 weeks from May, 1992)

### 4. Exchange of Genetic Resources Information, Literature, Breeding Materials and Research Materials

#### List of Literature collected from other Organizations

- 1) Catalogue of Plant Germplasm (3rd. ed., 1990) NIAR, Japan
- 2) Catalogue of Germplasm Collections 1989, AFRC Institute, U.K.
- 3) Catálogo de Datos Pasaporte de Colecciones de Germoplasma de Varios Cultivos (1989) INIAP, Ecuador
- 4) GRIN User's Manual (1992) ARS, USDA, U.S.A.
- 5) GRIN DATA Dictionary (1992) ARS, USDA, U.S.A.

Annex 10 : Data of Activities Submitted by the Project

5. EXCHANGE OF BREEDING AND RESEARCH MATERIALS

SOURCES OF BREEDING MATERIALS :

Blueberry	: U.S.A. (Oregon)
Raspberry	: U.S.A. (Oregon)
Peas	: Japan, U.S.A.
Garlic	: Argentina (INTA)
Asparagus	: U.S.A. ((U. California)
Potato	: Argentina, CIP (Peru)
Wheat (bread & durum)	: CIMMYT, Argentina, Brasil, Uruguay, Bolivia, Canada, U.S.A., Ex-Yugoeslavia
Barley	: CIMMYT, ICARDA
Oat	: U.S.A. (Wisconsin)
Rice	: CIAT
Maize	: CIMMYT
Faba bean	: ICARDA
Chickpea	: ICARDA
Common beans	: CIAT
Lentil	: ICARDA
Sweet Potato	: CIP
Others	: Japan, Uruguay, Brasil, Argentina, Colombia, Mexico, France U.K, U.S.A.



Annex 10 : Data of Activities Submitted by the Project

LIST OF RESEARCH PAPER PUBLICATIONS

- Shigeru SUZUKI y Tadayuki TOYAO (1990)  
El programa de recursos genéticos de Japón y su cooperación en Chile.  
SIMIENTE 60(3):20, 41 Congreso Agronómico - Santiago
  
- Alberto CUBILLOS y César BERTRAND (1991)  
La conservación de recursos genéticos. Parte II. El programa del  
INIA.  
IPA CARILLANCA 10(4):29-32
  
- Alberto CUBILLOS y Shigeru SUZUKI (1991)  
La conservación de recursos genéticos. Parte I. Un reto para la  
humanidad.  
IPA CARILLANCA 10(4):26-28
  
- Alberto CUBILLOS and Shigeru SUZUKI (1991)  
Japan assists Chile in Launching INIA Genetic Resource Conservation  
Program.  
Diversity 7(1-2):38-39
  
- Tadayuki TOYAO, Moisés ESCAFF y Carlos MUÑOZ (1991)  
Caracterización cariotípica de algunos clones de ajo.  
SIMIENTE 61(2-3):138 (Resumen), 42 Congreso Agronómico 1991 - Chillán
  
- Alberto CUBILLOS (1992)  
1992. Criterios para el funcionamiento del sistema de preservación de  
recursos genéticos. INIA., E.E. La Platina No. 40. 56p.
  
- Shigeru SUZUKI y Alberto CUBILLOS (1992)  
La aplicación de las biotecnologías en los programas de recursos  
genéticos.  
SIMIENTE 62:127-132

- Shigeru SUZUKI (1992)  
Development of the plant genetic resource conservation system  
-Plant Genetic Resource Conservation Project in Chile-  
Farming Japan 26(5):55-58
  
- Shigeru SUZUKI (1993)  
Modo no convencional de información en los recursos genéticos y la  
biotecnología.  
SIMIENTE (in press)
  
- Tadayuki TOYAO, Moisés ESCAFF y Carlos MUÑOZ (1993)  
Caracterización cariotípica de 34 clones de Ajo.  
Agricultura Técnica (Chile) 53(1)
  
- Alberto Cubillos, Andrés Contreras y Jubel Moraga, eds. 1993.  
Conclusiones y recomendaciones del Seminario Taller sobre Recursos  
Fitogenéticos.  
Seminario Taller sobre Recursos Fitogenéticos, INIA/JICA, La Leonera,  
Codegua Chile. 25 p. (in press)

Annex 10 : Data of Activities Submitted by the Project

LIST OF PRESENTATIONS IN CONGRESS

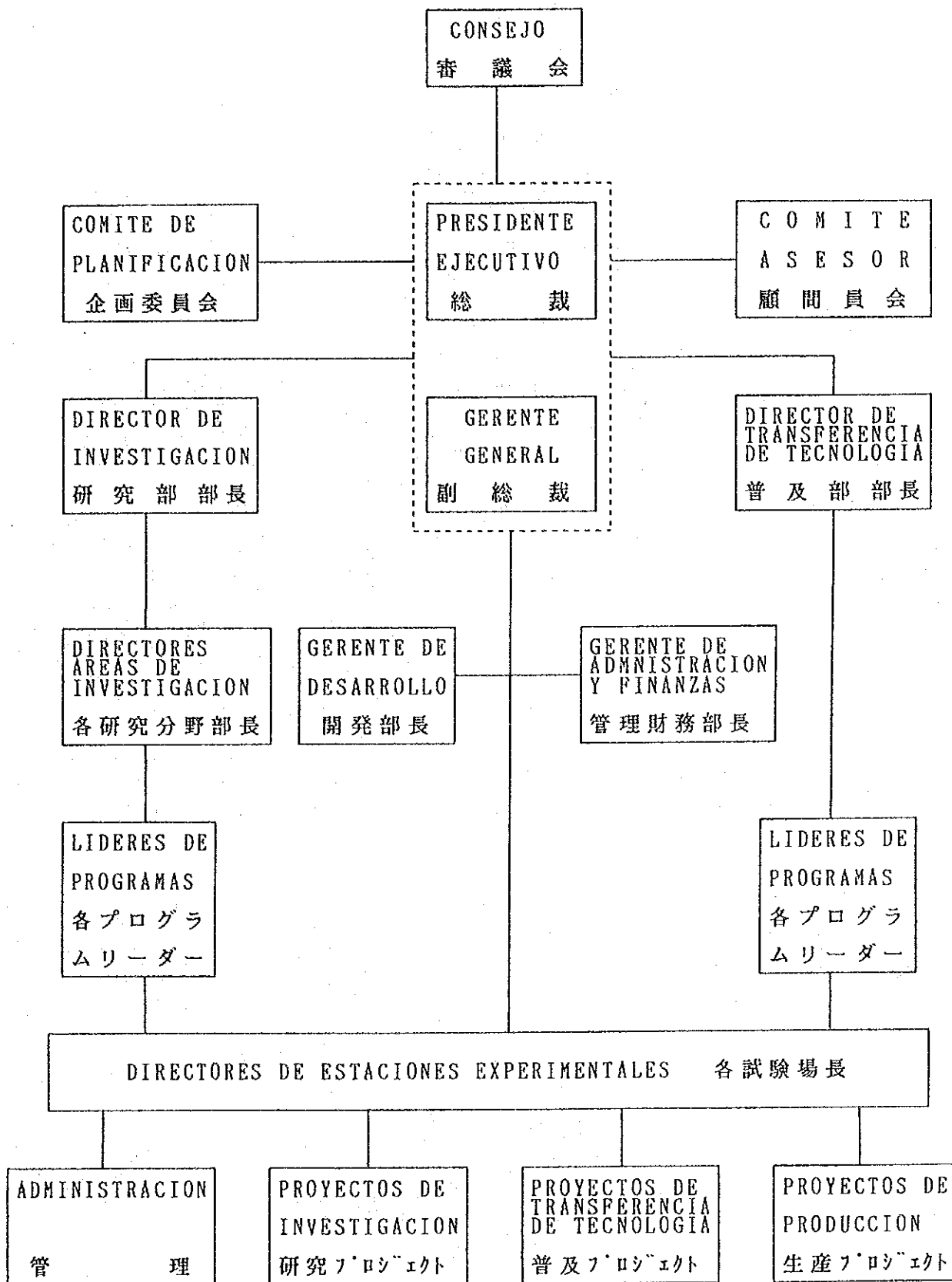
- Shigeru SUZUKI y Alberto CUBILLOS (1990)  
Aplicación de las biotecnologías en los programas de recursos genéticos.  
SIMIENTE 60(3):201 (Resumen), 41 Congreso Agronómico - Santiago
  
- Alberto CUBILLOS, Juan E. SIERRA y Kineo KUMAGAI (1991)  
La base de datos de Recursos Genéticos del INIA.  
SIMIENTE 61(2-3):164 (Resumen), 42 Congreso Agronómico 1991 - Chillán
  
- Shigeru SUZUKI (1991)  
Cooperación internacional e intercambio de recursos genéticos.  
II Reunión nacional sobre recursos fitogenéticos (Quito, Ecuador)
  
- Shigeru SUZUKI (1991)  
Modo no convencional de utilización de la información en el campo de los recursos genéticos y la biotecnología.  
SIMIENTE 61(2-3):165 (Resumen), 42 Congreso Agronómico - Chillán
  
- Tadayuki TOYAO, Nicole HEWSTONE y Carlos MUÑOZ (1991)  
Técnicas de recuento de cromosomas en especies de interés agrícola.  
SIMIENTE 61(2-3):164 (Resumen), 42 Congreso Agronómico 1991 - Chillán

Annex 11: Result of Evaluation for Attainment of Activities Evaluated by the Team  
PROGRESS OF THE ACTIVITIES

ITEM	CATEGORY OF ATTAINMENT				
	5	4	3	2	1
I. CONSTRUCTION OF THE BASE BANK, ACTIVE BANKS AND OTHER FACILITIES					
1. SEED STORAGE	○				
2. QUARANTINE GREENHOUSES	○				
II. GENETIC RESOURCES PROGRAM					
1. GENETIC RESOURCES MANAGEMENT AND RESEARCH					
(1) SURVEY AND COLLECTION					
1) RESEARCH ON STRATEGY OF COLLECTION			○		
2) DETERMINATION OF PRIORITY			○		
3) SURVEY OF DISTRIBUTION					○
4) CLASSIFICATION OF COLLECTION				○	
5) INTERNAL COLLECTION		○			
6) EXTERNAL COLLECTION				○	
7) EXCHANGE OF COLLECTION		○			
8) EXPEDITIONS				○	
(2) MULTIPLICATION AND REGENERATION					
1) MULTIPLICATION OF EXISTING RESOURCES		○			
2) MULTIPLICATION OF COLLECTED RESOURCES			○		
3) PHYSIOLOGY OF SEED PRODUCTION					○
4) MAINTENANCE OF GENETIC CONSTITUTION					○
(3) PRESERVATION AND CONSERVATION					
1) ANALYSIS OF SEED LONGEVITY					○
2) SEED AND VEGETATIVE PLANT CONSERVATION		○			
3) PHYSIOLOGY OF GERMINATION				○	
4) IN VITRO CONSERVATION		○			
5) DEVELOPMENT OF LONG-TERM IN VITRO CONSERVATION TECHNIQUES				○	
6) RESEARCH ON REGENERATION TECHNIQUES FROM CULTURED MATERIALS				○	
(4) EVALUATION					
1) STANDARDIZATION OF EVALUATION METHODS		○			
2) EVALUATION OF EXISTING RESOURCES		○			
3) DEVELOPMENT OF EVALUATION TECHNIQUES					○
4) DATA RECORDING AND MANAGEMENT					○
5) DEVELOPMENT OF DATA PROCESSING TECHNIQUES FOR EVALUATION					○
(5) DATA REGISTRATION AND PROCESSING					
1) SURVEY AND USE OF EXISTING DATA		○			
2) STANDARDIZATION OF DATA		○			
3) DESIGN OF INFORMATION SYSTEM		○			
4) CREATION OF DATA BASE		○			
5) DATA INPUT		○			
6) PUBLICATION OF INDEX SEMINUM				○	
7) ESTABLISHMENT OF NATIONAL INFORMATION NETWORK				○	
8) INTERNATIONAL EXCHANGE OF INFORMATION BY NETWORK	○				
2. ESTABLISHMENT OF QUARANTINE SYSTEM					
(1) SURVEY OF QUARANTINE SYSTEMS IN OTHER COUNTRIES FOR RESEARCH MATERIALS			○		
(2) ESTABLISHMENT OF QUARANTINE PROTOCOLS FOR RESEARCH MATERIALS			○		
(3) CONFORMANCE WITH NATIONAL QUARANTINE REGULATIONS			○		
(4) ESTABLISHMENT OF A NATIONAL QUARANTINE SYSTEM FOR RESEARCH MATERIAL			○		
(5) DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR DETECTION AND THERAPY				○	
3. UTILIZATION OF GENETIC RESOURCES INCLUDING BIOTECHNOLOGY					
(1) UTILIZATION OF RESOURCES BY CONVENTIONAL TECHNIQUES			○		
(2) RESEARCH OF RESOURCES BY CELL ENGINEERING TECHNIQUES				○	
(3) RESEARCH OF RESOURCES BY GENETIC ENGINEERING TECHNIQUES					○
III. EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS					
1. PREPARATION OF MANUALS			○		
2. SEMINARS, CONFERENCES AND MEETINGS		○			
3. PUBLICATIONS			○		
4. SHORT TERM COURSES					○
5. INTERNATIONAL EXCHANGE OF GENETIC RESOURCES INFORMATION AND BREEDING MATERIALS	○				

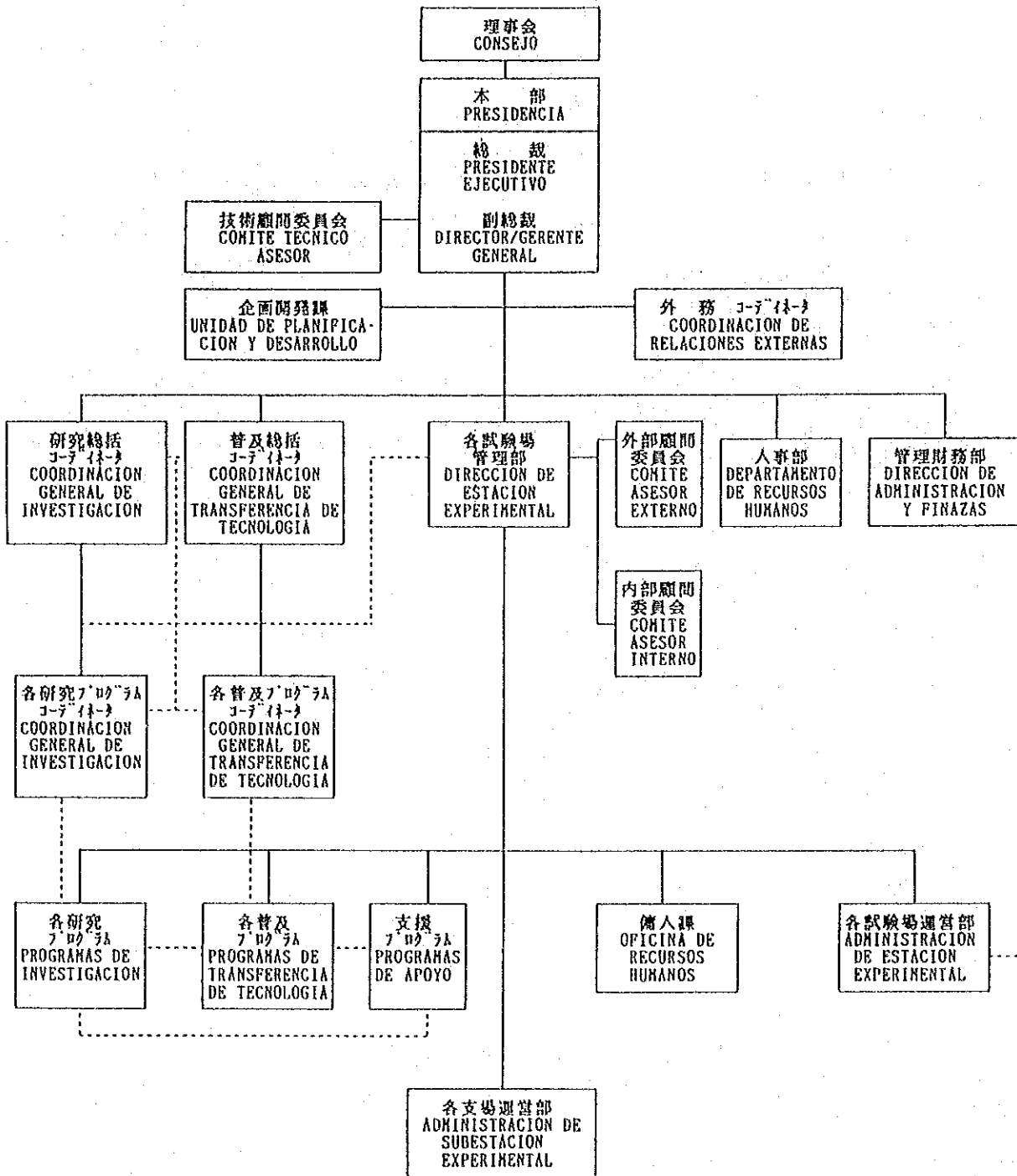
\* CATEGORY OF ATTAINMENT: 5:100%, 4:75%, 3:50%, 2:25%, 1:0%

Annex 12(1):Organizational Chart of INIA in 1989



Annex 12(2):Organizational chart of INIA in 1993

I N I A 組 織 図  
 ORGANIGRAMA BASICO  
 INIA





JICA