

Project Title: Project on conservation of the environment and rural development with farmers' participation for the Mediterranean dryland zone of Chile  
Target Area : Sector San Jose, Ninhue county

Project Period : 1 March 2000 ~ 28 February, 2005  
Target Group : Farmers in San Jose

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	Means of Verification	IMPORTANT ASSUMPTIONS					
<b>OVERALL GOAL</b> Sustainable agriculture and poverty alleviation will be promoted through a land and water conservation program at small-scale watershed areas in an inland dry region.	<ul style="list-style-type: none"> <li>Useful programs of agricultural development will be made out in 9 counties in inland region through the soil and water conservation.</li> </ul>	<ul style="list-style-type: none"> <li>Agricultural development program of county</li> </ul>	<ol style="list-style-type: none"> <li>Economic conditions are stable</li> <li>Problems of lot possession do not block application of the program</li> </ol>					
<b>PROJECT PURPOSE</b> Integrated land and water conservation technology for sustainable agriculture development will be verified at small scale watershed in Ninhue County, Region VIII.	<ol style="list-style-type: none"> <li>At least 30 farm households in San Jose use the technology of soil conservation which have been improved / developed by CADEPA.</li> <li>At least 2 farms at 5 micro-scale watersheds of sector San Jose use the technology of small-scale irrigation.</li> </ol>	<ol style="list-style-type: none"> <li>Project record</li> <li>Project record</li> </ol>	<ol style="list-style-type: none"> <li>Agricultural policies of the Ministry of Agriculture do not change.</li> <li>Natural condition does not change suddenly.</li> </ol>					
<b>OUTPUTS</b> <ol style="list-style-type: none"> <li>Elaborating the appropriate agricultural development plan at small-scale watershed level.</li> <li>Improving techniques for soil / water conservation.</li> <li>Verifying the practical integrated technology for soil / water conservation.</li> </ol>	<ol style="list-style-type: none"> <li>By the end of the project, the agricultural development plan is created in at least 2 model micro-scale watersheds. *See the note 1 below</li> <li>By the end of year 2003, the percentage of farmers who participated in the farm planning process of agricultural development plan is more than 60%. *See the note 2 below</li> <li>By the end of the project, the number of improved / developed techniques for soil and water conservation is at least 3.</li> <li>By the end of the project, environmentally friendly and appropriate technology for soil / water conservation is verified at the model farm and is presented in an manual on 4 topics.</li> <li>By the end of the project, at least 5 bulletins for farmers are created.</li> </ol>	<ol style="list-style-type: none"> <li>Agricultural Development Plan</li> <li>Project record (Monitoring Record)</li> <li>Technical report (Project record)</li> <li>Project record</li> <li>Manual, technical report (Project record)</li> <li>Project record</li> </ol>	<ol style="list-style-type: none"> <li>The credit / incentive to introduce the technology improved / developed by CADEPA for soil / water conservation is accessible to poor farmers according to Chilean government policy.</li> </ol>					
<b>ACTIVITIES</b> <ol style="list-style-type: none"> <li>Resources assesment and agricultural development planning of small-scale watershed area               <ol style="list-style-type: none"> <li>Water resource assessment</li> <li>Social and economic study</li> <li>Soil erosion status survey</li> <li>Agricultural development planning</li> </ol> </li> <li>Improvement of soil / water conservation technologies               <ol style="list-style-type: none"> <li>Improvement of small-scale by water saving irrigation technology.</li> <li>Improvement of water resources development technology (surface run off, underground water)</li> <li>Improvement of soil management and conservation technology</li> </ol> </li> <li>Verification of Integrated technology               <ol style="list-style-type: none"> <li>Verification and field demonstration of conservative soil / water and effective technology for utilization</li> <li>Preparation of manuals for soil and water conservation</li> </ol> </li> </ol>	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="562 842 1621 863">INPUTS</th> </tr> <tr> <th data-bbox="562 863 1144 895">Japanese Side</th> <th data-bbox="1144 863 1621 895">Chilean Side</th> </tr> </thead> <tbody> <tr> <td data-bbox="562 895 1144 1385"> <ol style="list-style-type: none"> <li>Dispatch of experts               <ol style="list-style-type: none"> <li>Dispatch of long-term experts                   <ol style="list-style-type: none"> <li>Chief Advisor</li> <li>Coordinator</li> <li>Irrigation / water resources</li> <li>Soil management</li> <li>Farming / cultivation</li> </ol> </li> <li>Short-term experts                   <ol style="list-style-type: none"> <li>Groundwater survey, Geophysical exploration</li> <li>Small-scale irrigation (water-saving, drip)</li> <li>Soil physics, Soil chemistry, GIS</li> <li>Cultivation</li> <li>Farm management</li> <li>Development economy</li> <li>Economic project evaluation</li> <li>Participatory survey and planning method</li> <li>Other necessary experts</li> </ol> </li> </ol> </li> <li>Provision of machinery, Equipment and Materials</li> <li>C/P training in Japan</li> </ol> </td> <td data-bbox="1144 895 1621 1385"> <ol style="list-style-type: none"> <li>Assignment of C/P (for each long-term expert, and suitable number of C/P for each short-term expert)</li> <li>Assignment of responsible person (Project director, Project manager)</li> <li>Assignment of administrative person</li> <li>Budget allocation (including experiences for demo farm operation)</li> <li>Project office, facilities (for 5 experts), land for verification and demonstration</li> </ol> </td> </tr> </tbody> </table>	INPUTS		Japanese Side	Chilean Side	<ol style="list-style-type: none"> <li>Dispatch of experts               <ol style="list-style-type: none"> <li>Dispatch of long-term experts                   <ol style="list-style-type: none"> <li>Chief Advisor</li> <li>Coordinator</li> <li>Irrigation / water resources</li> <li>Soil management</li> <li>Farming / cultivation</li> </ol> </li> <li>Short-term experts                   <ol style="list-style-type: none"> <li>Groundwater survey, Geophysical exploration</li> <li>Small-scale irrigation (water-saving, drip)</li> <li>Soil physics, Soil chemistry, GIS</li> <li>Cultivation</li> <li>Farm management</li> <li>Development economy</li> <li>Economic project evaluation</li> <li>Participatory survey and planning method</li> <li>Other necessary experts</li> </ol> </li> </ol> </li> <li>Provision of machinery, Equipment and Materials</li> <li>C/P training in Japan</li> </ol>	<ol style="list-style-type: none"> <li>Assignment of C/P (for each long-term expert, and suitable number of C/P for each short-term expert)</li> <li>Assignment of responsible person (Project director, Project manager)</li> <li>Assignment of administrative person</li> <li>Budget allocation (including experiences for demo farm operation)</li> <li>Project office, facilities (for 5 experts), land for verification and demonstration</li> </ol>	<p>The following organizations make an agreement of cooperation on each charge.</p> <p>(AGCI, ODEPA, SEREMI, INIA, INDAP, CNR, SAG, CONAF, Ninhue county office)</p> <p><b>PRE-CONDITIONS</b></p>
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<p>*Note 1 : Micro-scale watershed : There might be slight difference on the border of the area depending on the situation of farmers' participation.</p> <p>*Note 2 : The percentage of participation is based on the number of farmers who performed all of the following three actions at least once : ① Participating in CADEPA related techniques</p>	<p>① Participating in CADEPA training courses, ② Visiting PECA for learning purposes, ③ Applying to the government's support program for</p>							

Progress of Each Activity

ANNEX 2

Plans of activities by PO		Object to be attained	Progress and result					Evaluation	Reason for delay	Plan in the future		
Item	Contents		Achievement of activity	Output of activity	Year of activity							
					1st	2nd	3rd				4th	5th
<b>I. Baseline study</b>												
1. Study on farmers and farming systems		To clarify the farming systems of the producers, cultivation technology, land use situation	The baseline study was implemented.	Situation of the farming systems, cultivation technology and land use were made clear.	*					4		
	1) Socio-economic study on Rural Area	To find the socio-economic problems and the level of the farmers' technologies in the county Ninhue	The study results were utilized to find those problems and levels.	Socio-economic problems and level of farmer's technologies were confirmed.	*					4		
		To clarify the real situation of the socio-economic status and the agricultural exploitation status in the county Ninhue	The study results were utilized to clarify the situation.	Socio economic and agricultural exploitation status were clarified.	*					4		
	2) Study on the condition of agricultural production technology	The crops, the technological capacity of those cultivations and the opinions of those farmers at small watersheds if clarified. To confirm the study results	The study results were utilized to analyze crops, capacity of those cultivations and opinions of those farmers were clarified.	Technological capacity of crop cultivation and farmer's opinions were confirmed.		*				4		
2. Basic study on soil	1) Study on the damage situation of soil erosion	To find the problems on soil erosion control of soil and technology level about soil conservation	The baseline study was implemented.	Situation of the farmers' recognition about soil degradation and their demands were made clear.	*	*				4		
	2) Study on the technology situation of soil control and soil conservation		The baseline study was implemented.	Situation of soil characteristics in the sector San Jose and some way of their control by farmers were made clear.	*	*				4		
3. Basic study on water resources	1) Study on existing use of water resources	To find the problems on the use of water resources and to clarify the technology level of irrigation in the county Ninhue	The baseline study was implemented.	The status quo of the water resources and irrigation was made clear.	*					4		
	2) Study on the existing technology, the situation of small scale irrigation											

II. Resources assessment and agricultural development planning of small-scale watershed area												
<b>1. Water resource assessment</b>	1) Elaboration of a topographical map	To make a map of sector San Jose	The topographical map was made.	The map was used to study the status of land use, incline, affluence, etc.	*					4		
	2) Meteorological study	To collect meteorological data in the sector San Jose	The meteorological data has been collected.	The data was used to analyze the water resources development.	*	*	*	*	*	4		
	3) Study on Water superficial-rivers and torrents	To make clear the quantity of superficial and groundwater resources through the various studies (observation, geophysical exploration, boring) and its analysis	The run-off data was studied in sector San Jose.	The data was used to analyze the water resources and design the reservoir.	*	*	*	*	*	4		
	4) Studies of groundwater		The geophysical studies were implemented in sector San Jose.	The data was used to understand the underground water situation.	*	*	*	*	*	3	On schedule	
	-Geophysical study		The water level of the shallow well has been studied.	The data was used to make the irrigation plan	*	*	*	*	*	3	The groundwater has become known to be contaminated by coliform.	To investigate the countermeasure against water contamination of groundwater
	-Study on groundwater		The deep well and test boring were implemented.	It became clear the low probability for deep well.		*		*	*	2	The study was stopped after the construction of first deep well with insufficient water.	To continue the analysis for deep well in order to raise the probability to find deep underground water.
	-Sondage study		The hydrological balance study was done.	The percentage of water availability was made clear.			*			4		
-Calculation of hydrological balance												
<b>2. Social and economic study</b>	1) Study on the social and geographical conditions	To clarify the real situation of the socio-economic and farming conditions at the sector of San Jose	Investigations were carried out.	Real situation of the social and geographical conditions were summarized.	*			*		4		
	2) Study on the economic situation and management of the farmers		Investigation has been implemented.	Real economical situation and manner of management will be clarified.	*		*	*	*	3	On schedule.	
	3) Study on the technical capacity of cultivation	To clarify the levels of the farmers' technologies and their intentions at the sector San Jose	Questionnaire was made to survey technological level and farmer's intentions.	The level of farmer's technologies and intentions were clarified.	*			*		4		
	4) Classification of data of existing cultivations	To confirm the data and results investigated	Data collection has been made.	Data of existing cultivation was summarized.	*		*	*	*	3	On schedule.	

3. Soil erosion status survey	1) Study on the condition of damages of soil erosion	To clarify the degree of soil erosion at the sector San Jose	The study on the condition of damages of soil erosion has been done by using USRE formula.	The situation of damages of soil erosion in the sector San Jose would be made clear on a map.	*	*	*	*	3	On schedule	
	2) Tests and analysis of soil erosion at plots -Preparation of test plots -Preparation of study of torrent -Analyses		/ Test plots were installed at two points with different slopes. The quantities of eroded soil and run off water from the plots have been measured continually. / Some gully were chosen and a study about gully development is going on. / The quantity of runoff sediment was compared between micro-watershed with soil conservational managements and one without soil conservation managements.	/The quantitative difference of runoff sediment among types of tillage-non-tillage, natural pasture and traditional tillage - has been made clear. / The gully development has been clarified. /The effectiveness of soil conservational managements on soil erosion has been clarified.	*	*	*	*	3	On schedule	
4. Agricultural development planning	1) Formulation of use plan of water resources	To calculate the availability for irrigation water	The water requirement and availability were calculated in the micro watershed areas.	The method of water use plan would be made clear.		*	*	*	3	On schedule	
	2) Preparation of map of election of good places for water resources	To make maps of good places for water resources development at Ninhue county	The studies has been done in Ninhue county.	The maps for water resources development would be made in 10 micro watersheds.	*	*	*	*	3	On schedule	
	3) Preparation of soil map -(Soil improvement, fertilization)	Soil map will be utilized for the elevation of farming technology.	Soil survey work has been done in Ninhue county.	The soil maps for soil improvement and fertilization have been made all over the Ninhue county and 2 model micro watershed.	*	*	*	*	3	On schedule	
	4) Preparation of model on farming pattern	Crops calendar will be utilized for the elevation of farming technology.	The model farming pattern has been studied.	The model farming pattern was made.		*	*	*	4		
	5) Preparation of crops calendar		Crop calenders have been under preparation.	Crop calenders would be completed in time.	*	*	*	*	3	On schedule	
	6) Land use plan	To prepare appropriate land use plan	The studies and discussion has been done for the land use plan in 2 micro watershed	The land use plan has been made by using improved technologies and with farmers' participation.			*	*	3	On schedule	To establish the method of simple land use plan by using GIS.
	7) Afforestation plan for soil conservation	To contribute the water/soil conservation by tree-planting	The studies and discussion with farmers has been done for afforestation plan.	/ The afforestation plan has been made. / Some farmers are going to planting trees on their lands.	*	*	*	*	3	On schedule	
	8) Program for economic evaluation of different production alternatives	To contribute the alleviation of poverty by using resources effectively	To contribute the alleviation of poverty survey was implemented to recognize the farmer's opinion .	Individual program for each farmer would be made.			*	*	3	Study was started after mid-term evaluation.	To make program feasible to contribute the alleviation of poverty.
	9) Promotion in organization of groups for cooperative use of machinery	To form the groups for cooperative use of non-tillage sowing machines pulled by animal	Discussed through the course necessity of forming farmer's group to use no-tillage sowing machines with farmers.	Farmers proposed to cooperative group for using no-tillage sowing machines and others.	*	*	*	*	2	Under discussion in CADEPA for the form of group to work smoothly and to be attainable.	To decide the form of group and to start working.

III. Improvement of soil/water conservation technologies													
1. Improvement of small-scale by water saving irrigation technology	1) Technology for drip-irrigation	To improve technology for small scale irrigation	The study for drip irrigation has been done in the demonstration field.	The water management system for drip irrigation was improved.			*	*	*	3	On schedule	To continue the analysis of drip-irrigation for the matured fruits.	
	2. Improvement of water resources development technology (surface run off, underground water)	1) Pond of small scale	To improve technology for small scale reservoir	The study of reservoir was done in the model micro watersheds.	The small scale reservoir has made in a farmer's field.			*	*	*	2	The study was stopped after the mid-term evaluation.	To continue the analysis for reservoir.
		2) Irrigation with groundwater	To elaborate the plan of underground water use	The study and analysis were done by using investigating data.	The method was made for estimating water availability of shallow well.			*	*	*	2	The study of fracture zone with test boring is just starting.	To continue the study and analysis for the fracture zone.
		3) Test of demonstration of water resources development	To demonstrate the irrigation system	The water resources study was done in the demonstration field.	The water resources were developed in the demonstration field.	*	*	*	*	*	3	On schedule	
			To prove the technology of solar energy						*	*	2	The study was started after the mid-term evaluation.	To continue the analysis for local energy
3. Improvement of soil management and conservation technology	1) Cultivation technology without plowing	To improve the appropriate technologies for soil control and conservation in the sector San Jose.	The non-tillage or minimum tillage cultivation technology was studied.	Cultivating technologies were developed.			*	*	*	*	3	Some problems to be studied are becoming obvious like treatment of straws..	To continue the study.
	2) Fertilization technology appropriate for the cultivation		The study on fertilization technology appropriate for the cultivation has been done.	Fertilization technologies appropriate for the cultivation have been developed.			*	*	*	*	3	Some nutrimental problems are becoming obvious.	To continue the study
	3) Technology to improve the soil for fruits and leguminous		The study for improving the soil has been done.	Technology to improve the soil are developing.			*	*	*	*	2	To make more clear, the study on this subject needs more time.	To continue the study
	4) Composting technology with crop residuals		The study on composing technology was done.	Composing technology with crop residuals was developed.			*	*	*	*	4		

IV. Verification of integrated technology												
1. Verification and field demonstration of conservative soil/water and effective technology for utilization	1) Irrigation technology of fruit-bearing	To make sure water resource at the small scale watershed	Irrigation system has been managed for the fruits.	The farmers introduced drip irrigation system in sector San Jose.	*	*	*	*	*	3	On schedule	
		To promote the water use for the cultivations of fruits and vegetables.	Promotion has been taking place on fruits and vegetables.	The farmers expressed to use system on fruits and vegetables.	*	*	*	*	*	3	On schedule	
	2) Demonstration of the use of water of pond and underground water	To verify the technology of using underground water and reservoir water.	Water resources were developed and shown in the demonstration field by using shallow well, deep well and tank.	The farmers made new shallow wells and tanks for their irrigation system.			*	*	*	2	The reservoir did not introduced yet.	To continue the study of reservoir and show it at the farmer's field.
	3) Technology of irrigation of vegetables, etc.	To verify the technology of irrigation for vegetables, etc.	The irrigation system was constructed in the green house at the demonstration field.	The farmers introduced drip irrigation system in their green house.		*	*	*	*	3	On schedule	
	4) Cultivating technology without plowing	To verify cultivating technology without plowing	The yields of wheat under non-tillage cultivation and its components were investigated and some recommendations for better management were given for each farmer.	/ The farmers who cultivate crops using non-tillage system are increasing. / Many farmers have been adopting new technology of non-tillage cultivation like treatment of subsoiler.		*	*	*	*	3	Some problems exist even now like weeds control or better cultivating technology for leguminous.	To continue verifying of improved technologies.
	5) Fertilization technology appropriate for the cultivations	To verify the technologies for appropriate fertilizer, improving soil and using resources of organic substances, etc.	The soils for non-tillage cultivation were analyzed and fertilizational recommendations were given for each farmer.	/ The farmers use appropriate fertilizer for non-tillage cultivation. / Many farmers have been adopting new technology of non-tillage cultivation like application of fowl drops.		*	*	*	*	3	It seems that some plant nutritious problems exist even now on non-tillage cultivated crops.	To continue verifying of improved technologies.
	6) Technology to improve the soil for fruits and leguminous		The soils under non-tillage cultivation where rupin was grown for soil improvement were investigated.	Some farmers have cultivated rupin or hualputra for soil improvement.		*	*	*	*	3	Some problems exist even now on better cultivating technology for leguminous.	To continue verifying of improved technologies.
	7) Composting technology with crop residuals		The characteristics of composts or other organic matter in/around the sector SAN JOSE were investigated.	The farmers would understand the effects of compost or organic matter.			*	*	*	4		
	8) Selection of new cultivations and new cultivation technologies	To elaborate the program for economically different alternatives.	Investigated economically different alternatives.	Elaborated the program of economically different alternatives.			*	*	*	3	On schedule	
	9) Technology of crop rotation system by cultivation without plowing	To verify the availability of rotation system without plowing.	Rotation system was introduced to farmers.	Farmers adopted rotation system without plowing.		*	*	*	*	3	On schedule	
	10) Technology for high quality production	To improve the quality of vegetables, grapes and wines	Greenhouse cultivation was introduced. Training for grafting of grape trees was done. Recommendation in each area of cultivation was summarized.	JICA introduced 2 greenhouses in 2 small water-shades and formed 2 working groups to practice cooperative working and sustainable cultivation system.		*	*	*	*	3	On schedule	
11) Technology of sustainable agriculture	To promote Agro-forestry system.	Introduced the system in technological manual of cultivation.	Demonstrative cultivation has started in PECA.		*	*	*	*	3	Needs more time to evaluate.	To continue cultivation to verify the effect.	

2. Preparation of manuals for soil and water conservation	1) Study, planning, evaluation	To present the improved technologies through manuals	Collecting materials and discussion have been done for the manuals	The manuals would be made.		*	*	*	*	3	On schedule	
	2) Irrigation/water resources											
	3) Soil management	To extend the improved technologies through conferences, training and seminars to other regions	The conference, training and seminar have been implemented.	The technologies are extending by a lot of activities for extension.								
	4) Agricultural systems and cultivation											

1 : No activity  
2 : Remaining problem (It will not be able to complete the activity until February 2005)  
3 : It will be able to complete the activity until February 2005.  
4 : Completion

## Long-term Experts

Area of speciality	Name	Period of dispatch
Chief Advisor	Nobuyoshi SAKAMOTO	2000/03/25 – 2002/05/31
Chief Advisor	Yukio SHINOMI	2002/06/10 – 2005/02/28
Project Coordinator	Shinichi KONDO	2000/03/01 – 2003/02/28
Project Coordinator	Hiroshi ISAKI	2003/02/15 – 2005/02/28
Irrigation and Water Resources	Koki OTA	2000/03/01 – 2003/02/28
Irrigation and Water Resources	Yukio OKUDA	2003/02/15 – 2005/02/28
Soil Management	Shigehiko YOSHIKAWA	2001/05/21 – 2005/02/28
Farming and Cultivation	Tadashi MANABE	2000/03/01 – 2003/02/28
Farming and Cultivation	Kuni MATSUYA	2003/02/15 – 2005/02/28

## Short-term Experts

Area of speciality	Name	Period of dispatch
Agricultural Economics	Shoichi ISHIOKA	2000/08/05 – 2000/09/02
Participatory Survey Method	Shiro MUKAI	2000/08/05 – 2000/10/04
Soil Management	Shigehiko YOSHIKAWA	2000/09/20 – 2000/11/19
Groundwater Survey	Masayuki IMAIZUMI	2000/12/05 – 2000/12/25
Geophysical Exploration	Hiroomi NAKAZATO	2000/12/05 – 2000/12/25
Soil Physics	Azumi TAKAGI	2000/12/07 – 2000/12/25
Economy for the Development	Shunsuke AKAMATSU	2001/05/21 – 2001/06/23
Geographic Information System	Ryota NAGASAWA	2001/07/23 – 2001/08/19
Soil Chemistry	Koichi HONDA	2001/09/03 – 2001/10/29
Small-scale Irrigation	Michio NARUOKA	2001/10/01 – 2001/10/29
Technology of Small-scale Reservoir	Tutomu KOBAYASHI	2002/01/20 – 2002/02/17
Soil Conservation	Takao FUJIMOTO	2002/06/17 – 2002/07/15
Agrarian Study for Sociology	Izumi CHIBA	2002/08/02 – 2002/08/27
Water Conservation	Yukio Okuda	2002/09/09 – 2002/10/07
Control of Diseases and Insects	Sadayoshi TASHIRO	2003/02/07 – 2003/03/05
Improvement of no-Tillage Seeder	Mikio YASHIRO	2003/06/17 – 2003/07/15
Planning of Model Farming System	Kiyoshi SAKAI	2003/07/03 – 2003/07/31
Groundwater Development	Keisuke TAKAGI	2004/09/04 – 2004/10/02
Evaluation of Project Impact	Naoya SHIMIZU	2003/09/28 – 2003/10/24
Fruit Cultivation in Dryland Zone	Kuniaki TAKAHASHI	2003/11/06 – 2002/12/04
Planning of Model Farming System	Kiyoshi SAKAI	2003/12/01 – 2003/12/27
Improvement of no-Tillage Seeder	Mikio YASHIRO	2004/04/15 – 2004/05/22
Groundwater Development	Keisuke TAKAGI	2004/07/01 – 2004/07/30



Training Area	Name	Period of Training of Study
Agricultural Machineries	Jorge RIQUELME	Before the beginning of CADEPA
Rural Agriculture development with the peasants participation	Patricia ZAMBRANO	Before the beginning of CADEPA
Agriculture Economics	Carlos RUIZ	2000/07/03 – 2000/08/02
Water Resources Management/irrigation	Harald WAGEMANN	2000/10/01 – 2000/11/25
Water Conservation/hierology resources	Hamil URIBE	2000/10/01 – 2000/11/25
Assessment of Agricultural Environment	Claudio PEREZ	2001/01/15 – 2001/02/16
Planning and Management	Hernan ACUÑA	2001/06/16 – 2001/07/01
Soil Chemistry	Nicasio RODRIGUEZ	2001/06/30 – 2001/07/25
Irrigation (Water saving irrigation, drip irrigation)	Angelica BORQUEZ	2001/08/17 – 2001/09/23
Water Resources (Plant/cost estimation)	Nolberto ORTIZ	2001/08/17 – 2001/09/23
GIS	Marcelino CLARET	2001/11/03 – 2001/12/09
Pasture / Farming	Fernando FERNANDEZ	2002/02/24 – 2002/03/23
Agriculture Economics	Roberto VELASCO	2002/02/24 – 2002/03/23
Rural Agriculture development with the peasants participation	Nelba GAETE	2002/06/20 – 2002/07/30
Peasant Organization	Patricio LEIGHTON	2002/08/25 – 2002/09/13
Water Harvest	Claudio ALIAGA	2002/10/01 – 2002/10/29
Soil Conservations	Ciro BELMAR	2002/10/01 – 2002/10/25
Support System for Small Farmers	Mitzi JELDRES	2003/02/19 – 2003/03/15
Agricultural and Rural Development	Andres CASTILLO	2003/02/21 – 2003/03/07
Development, extension of Agricultural Technology	Emilio RUZ	2003/06/22 – 2003/07/03
Quality Evaluation of Agricultural Products	Juan Pedro SOTOMAYOR	2003/08/24 – 2003/09/20
Rainfall Runoff model	Octavio LAGOS	2003/10/05 – 2003/11/07
Administration for Rural Development	Patricio HUEPE	2004/02/13 – 2004/02/28
Remote Sensing and GIS	Juan Paulo RAMIREZ	2004/02/23 – 2004/03/19
Sustainable Water Resources Development on Agricultural and Rural Area	Francisca ALVAREZ	2004/05/15 – 2004/07/31

## Provision of Machinery, Equipment and Materials

ANNEX 5

Fiscal Year	Name of Equipment			Unit Price ( \$ )	Q'ty	Total Price ( \$ )	Place of Installation	Utility	Stete
2,000	Rotary Mower			478,800	1	478,800	INIA Quilamapu	A	Excellent
2,000	Eclinometro	Abney Chicago		97,527	1	97,527	Irrigation/water resources	—	Stolen
2,000	Rain Recorder	Hobo		214,354	1	214,354	Irrigation/water resources	A	Excellent
2,000	GPS	Garmin	Ill Plus	381,807	1	381,807	Irrigation/water resources	—	Stolen
2,000	Double Prism			94,778	1	94,778	Irrigation/water resources	A	Excellent
2,000	Printer	HP	840	110,000	1	110,000	General Administration	A	Excellent
2,000	Digital Anemometer			390,929	1	390,929	Irrigation/water resources	A	Excellent
2,000	Mapping Software SURFER	Golden		374,312	1	374,312	GIS	A	Excellent
2,000	Chainsaw	Husqvarna		261,000	1	261,000	INIA Quilamapu	A	Excellent
2,000	GPS	Magellan Map	410	428,694	2	857,388	Irrigation/water resources	A	Excellent
2,000	Set TV	Sony	KV-29FV16C/7	483,890	1	483,890	General Administration	A	Excellent
2,000	Video Camera	Sony	CCD-TRV98	460,960	1	460,960	General Administration	A	Excellent
2,000	Video Deck	Sony	SLV-L7SCL	97,900	1	97,900	General Administration	A	Excellent
2,000	Trailer		4	944,000	1	944,000	Farming/Cultivation	A	Excellent
2,000	Plotter HP	HP	DesignJet 1655CM	5,737,578	1	5,737,578	GIS	A	Excellent
2,000	Autocad Map 2000	Map	2,000	2,917,581	1	2,917,581	GIS	A	Excellent
2,000	Desktop Computer	SOFCOM		579,800	4	2,319,200	General Administration	A	Excellent
2,000	Notebook Computer	Armada100	PP1020	1,050,000	3	3,150,000	General Administration	A	Excellent
2,000	Printer laserjet	HP	45	1,654,203	1	1,654,203	General Administration	A	Excellent
2,000	Soil moisture meter	Aqua pro		672,419	1	672,419	Irrigation/water resources	A	Excellent
2,000	Electrical Generator	Daishin	AD-2800	5,112	1	5,112	Irrigation/water resources	A	Excellent
2,000	Software Imagine Virtual	Erdas Imagin		5,531,064	1	5,531,064	GIS	A	Excellent
2,000	PH meter	Horiba	Twin meter	697,540	1	697,540	Irrigation/water resources	A	Excellent
2,000	Notebook Computer	Compaq	PP1020	1,045,000	1	1,045,000	General Administration	—	Stolen
2,000	Starflow System	Starflow	6526-21	1,604,800	1	1,604,800	Irrigation/water resources	A	Excellent
2,000	Soil Moisture Meter			7,570,050	1	7,570,050	Soil Management	A	Excellent
2,000	Water Levelmeter DIK 602A-A1	DAIKI	DIK-321	1,429,950	1	1,429,950	Irrigation/water resources	A	Excellent
2,000	Water Levelmeter DIK 601A-A1			936,230	1	936,230	Irrigation/water resources	A	Excellent

2,000	Groundwater level meter DIK 602A-C1			4,289,950	1	4,289,950	Irrigation/water resources	A	Excellent
2,000	Groundwater level meter DIK 602A-B1			2,859,900	1	2,859,900	Irrigation/water resources	A	Excellent
2,000	Groundwater level meter DIK 601A-B1			1,872,460	1	1,872,460	Irrigation/water resources	A	Excellent
2,000	Groundwater level meter DIK 601A-A1			1,872,460	1	1,872,460	Irrigation/water resources	A	Excellent
2,000	Total station main unit set	Sokkia	SET5005	6,682,600	1	6,682,600	Irrigation/water resources	A	Excellent
2,000	Vehicle Single Cabin	Chevrolet Luv		6,625,125	1	6,625,125	Farming and Cultivation	A	Excellent
2,000	Vehicle Double Cabin	Chevrolet Luv	Millenium	7,499,900	1	7,499,900	Soil Management	A	Excellent
2,000	Earth Resistivity Meter			46,441,500	1	46,441,500	Irrigation/water resources	A	Excellent
2,000	Electromagnetic Wave Analyzer			40,705,800	1	40,705,800	Irrigation/water resources	A	Excellent
2,000	Portable Gamma Ray Analyzer			36,041,060	1	36,041,060	Irrigation/water resources	A	Excellent
2,000	Seeder Juber	Juber	Serie 200	18,254,600	1	18,254,600	Soil Management	A	Excellent

## Provision of Machinery, Equipment and Machinery

Fiscal Year	Name of Equipment			Unit Price (\$)	Q'ty	Total Price (\$)	Place of Installation	Utility	Stete
2,001	Electrical Generator	Jesan		483,890	1	483,890	General Administration	A	Excellent
2,001	Altimeter	Brunton	Sherpa Class	159,182	1	159,182	GIS	A	Excellent
2,001	Sugar Refractometer 0-32%brix	Atago	ATC-1E	177,018	1	177,018	Farming and Cultivation (Cauquenes	A	Excellent
2,001	Sugar Refractometer 28-62%brix	Atago	ATC-2E	202,075	1	202,075	Farming and Cultivation (Cauquenes	A	Excellent
2,001	Pump	Pedrollo	4SR 2M	400,492	1	400,492	Irrigation/Water Resources	A	Excellent
2,001	Pump	Pedrollo	E90 C7	255,389	1	255,389	Irrigation/Water Resources	A	Excellent
2,001	Binocular	Tasco	10x50	52,781	1	52,781	GIS	A	Excellent
2,001	Curvimeter concurve eight			123,750	1	123,750	GIS	A	Excellent
2,001	Digital Camera	Sony	MVC CD200	470,248	1	470,248	General Administration	—	Stolen
2,001	Soil Hardness tester	Daiki	DIK5553	382,634	1	382,634	Soil Management	A	Excellent
2,001	Wooden frame square sieve			148,500	1	148,500	Irrigation/Water Resources	A	Excellent
2,001	Tray S33-18 custom W500xl			30,195	1	30,195	Irrigation/Water Resources	A	Excellent
2,001	Tray S33-18 custom W670xl			74,250	1	74,250	Irrigation/Water Resources	A	Excellent
2,001	Concrete	Pan	c122a	246,509	2	493,018	Irrigation/Water Resources	A	Excellent
2,001	Soil Thermometer	Weksell		34,456	1	34,456	Soil Management	A	Excellent
2,001	Clinometer	Abney Chicago 5		114,637	1	114,637	GIS	A	Excellent
2,001	Pole	Nedo		9,853	20	197,060	Irrigation/Water Resources	A	Excellent
2,001	Scanner	HP	C9870#AC3	140,351	1	140,351	General Administration	A	Excellent
2,001	CD Rom Recorder	IOMEGA	ZIPCDUSB	129,800	2	259,600	General Administration	—	Stolen
2,001	CR Rom Recorder	IOMEGA	GCE-8160B	78,200	2	156,400	General Administration	A	Excellent
2,001	Webcam USB			85,000	2	170,000	General Administration	A	Excellent
2,001	Hard Disk 60 GB			106,500	1	106,500	GIS	A	Excellent
2,001	Standard Soil Color Charts			116,820	1	116,820	Soil Management	A	Excellent
2,001	PH meter	Horiba		363,714	1	363,714	Irrigation/Water Resources	A	Excellent
2,001	Video Deck	Sony		103,900	1	103,900	Municipalidad Ninhue	A	Excellent
2,001	Portable Color meter	Orion	Aquafast IV	889,130	1	889,130	Farming and Cultivation (Cauquenes	A	Excellent
2,001	Fertilizer Aplicator	Breuer		1,177,640	1	1,177,640	Soil Management	A	Excellent
2,001	Rake	Yardage	PTO1000	758,200	1	758,200	Farming and Cultivation	A	Excellent

2,001	Distance meter	Bushnell	1000	537,030	1	537,030	GIS	—	Stolen
2,001	Stationary Thresher	LV		3,250,000	1	3,250,000	Farming/Cultivation	A	Excellent
2,001	Laboratory Thresher	LV		1,250,000	1	1,250,000	Farming/Cultivation	A	Excellent
2,001	Shaker and Accesories	Lab line		1,851,833	1	1,851,833	Farming/Cultivation	A	Excellent
2,001	Computer desktop	Athlon	AMDK7	1,949,722	1	1,949,722	GIS	A	Excellent
2,001	Notebook Computer	Compaq	Armada M700	2,311,622	1	2,311,622	General Administration	A	Excellent
2,001	Chopper	Comersa		3,386,000	1	3,386,000	Soil Management	A	Excellent
2,001	Sprayer	Rautop	PI 500	1,855,803	1	1,855,803	Soil Management	A	Excellent
2,001	Binocular Microscope	Axiolab		3,829,259	1	3,829,259	Farming/Cultivation	A	Excellent
2,001	Stereomicroscope	Carl Zeiss	STEMI 2000	2,657,585	1	2,657,585	Farming/Cultivation	A	Excellent
2,001	Analytic Balance	Precisa	XB220A	1,229,311	1	1,229,311	Farming/Cultivation	A	Excellent
2,001	GPS Garmin	Garmin III Plus		436,246	1	436,246	GIS	A	Excellent
2,001	Printer	HP	990	250,000	2	500,000	General Administration	A	Excellent
2,001	ZIP USB	IOMEGA	PCMBP	129,500	4	518,000	General Administration	A	Excellent
2,001	Hard Disk 40 GB	Maxtor	USB2040QLE001	255,200	2	510,400	General Administration	A	Excellent
2,001	Chomatography Columns	Perkin Elmer		273,713	3	821,139	Farming/Cultivation (Cauquenes)	A	Excellent
2,001	TV set	Sony		559,900	1	559,900	Municipalidad Ninhue	A	Excellent
2,001	Microphotographic equipment binocula	Axiolab		2,942,787	1	2,942,787	Farming/Cultivation	A	Excellent
2,001	Steel Camera and sweet	Minolta	AF28-80	1,368,670	1	1,368,670	General Administration	—	Stolen
2,001	Conductivity meter twin			747,447	1	747,447	Irrigation/Water Resources	A	Excellent
2,001	PH meter twin	Horiba		1,456,284	1	1,456,284	Irrigation/Water Resources	A	Excellent
2,001	Stainless sampling tube 100ml			15,840	72	1,140,480	Soil Management	A	Excellent
2,001	Stainless sampling tube 50ml			149,489	9	1,345,401	Irrigation/Water Resources	A	Excellent
2,001	Falling Head Permeameter	Daiki		1,049,396	2	2,098,792	Soil Management	A	Excellent
2,001	Three Phase Meter	Diki1130		2,727,440	1	2,727,440	Soil Management	A	Excellent
2,001	Soil Column Metod Kit for Pf	Daiki	3521	1,588,944	1	1,588,944	Irrigation/Water Resources	A	Excellent
2,001	Cilindrical Intakerate Meter			1,613,694	1	1,613,694	Irrigation/Water Resources	A	Excellent
2,001	Groundwater Level Recorder 603A C1			2,391,831	1	2,391,831	Irrigation/Water Resources	A	Excellent
2,001	Groundwater Level Recorder 601A A1			1,617,602	1	1,617,602	Irrigation/Water Resources	A	Excellent
2,001	Standard Compaction set SG10			1,747,343	1	1,747,343	Irrigation/Water Resources	A	Excellent
2,001	Variable Head Permeability			985,046	5	4,925,230	Irrigation/Water Resources	A	Excellent
2,001	Compressor S18-t-2b			1,410,745	1	1,410,745	Irrigation/Water Resources	A	Excellent

2,001	Vacuum Pump			1,108,796	1	1,108,796	Irrigation/Water Resources	A	Excellent
2,001	Power Tiller K120xRK125	Kubota	RK125-2	4,884,641	1	4,884,641	Farming/Cultivation	A	Excellent
2,001	Soil Penetrometer SR-2	Daiki	DIK5501	2,051,025	1	2,051,025	Soil Management	A	Excellent
2,001	VibroSubsoiler S226	Matsuyama	S-226	2,804,164	1	2,804,164	Farming/Cultivation	A	Excellent
2,001	Half Step Log Sprayer		PSB500	1,098,805	1	1,098,805	Farming/Cultivation	A	Excellent
2,001	Trailer TG 140B-VG	Yanmar	TG 140B-VG	3,213,528	1	3,213,528	Farming/Cultivation	A	Excellent
2,001	Copy Machine	Ricoh	Aficio 4006	7,005,223	1	7,005,223	General Administration	A	Excellent
2,001	Spectrofotometer	Lambda	C6950811	5,780,289	1	5,780,289	Farming/Cultivation (Cauquenes)	A	Excellent
2,001	Freeze Dryer System	Sanyo	MDF-U5086W	5,680,817	1	5,680,817	Farming/Cultivation	A	Excellent
2,001	Portable Leaf Meter	Eijelkamp	AM200-002	7,151,158	1	7,151,158	Farming/Cultivation (Cauquenes)	A	Excellent
2,001	Groundwater level Recorder DIK 603A			8,007,090	1	8,007,090	Irrigation/Water Resources	A	Excellent
2,001	Vehicle Wagon 4WD	Chevrolet	Grand Luv	12,785,440	1	12,785,440	Irrigation/Water Resources	A	Excellent
2,001	Tractor	New Holland	TL 90	14,939,893	1	14,939,893	Farming/Cultivation	A	Excellent
2,001	Chromatography	Perkin Elmer	Serie 200	15,083,835	1	15,083,835	Farming/Cultivation (Cauquenes)	A	Excellent
2,001	Spray Booth	Belspray	SB6	24,261,213	1	24,261,213	Farming/Cultivation (Cauquenes)	A	Excellent
2,001	Biodegester	C. Parmer		15,398,500	1	15,398,500	Farming/Cultivation	A	Excellent
2,001	Combine	New Holland	TC-55	43,027,400	1	43,027,400	Farming/Cultivation	A	Excellent
2,001	Trencher	F45 LH		14,168,579	1	14,168,579	Irrigation/Water Resources	A	Excellent
2,001	Soil Moisture Meter ste	Daiki	DIK-321A	20,636,472	1	20,636,472	Soil Management	A	Excellent
2,001	Chromatography accesories	P. Elmer	RI-71	20,085,000	1	20,085,000	Farming/Cultivation (Cauquenes)	A	Excellent
2,001	Elemental Analyzer C, N, S		Max CNS	35,483,500	1	35,483,500	Soil Management	A	Excellent

## List of Machinery, Equipment and Machinery

Fiscal Year	Name of Equipment			Unit Price (\$)	Q'ty	Total Price (\$)	Place of Installation	Utility	Stete
2,002	TV Sony	Sony	KV-29FS100	460,000	1	460,000	San Jose	A	Excellent
2,002	Digital Still Camera	Sony	MVC-CD200	617,880	1	617,880	Technical Agriculture	A	Excellent
2,002	Trailer	Solmet (verde)		2,336,400	1	2,336,400	Farming/Cultivation	A	Excellent
2,002	Palote	Rodameg		885,000	1	885,000	Farming/Cultivation	A	Excellent
2,002	Printer	HP	3420 USB	85,000	1	85,000	Irrigation/Water Resources	A	Excellent
2,002	Toolbook Asistant	Toolbook	8.5	1,459,601	1	1,459,601	General Administration	A	Excellent
2,002	ZIP	lomega	USB 250Mb	126,000	1	126,000	General Administration	—	Stolen
2,002	Video Deck	Sony	SLV-LX77	89,900	1	89,900	San Jose	A	Excellent
2,002	Carro Demostrativo Sistema de Riego			1,621,267	1	1,621,267	Irrigation/Water Resources	A	Excellent
2,002	Printer	HP	990Cxi	277,000	1	277,000	General Administration	A	Excellent
2,002	Juber Accesories			5,361,330	1	5,361,330	Soil Management	A	Excellent

## Provision of Machinery, Equipment and Materials

Fiscal Year	Name of Equipment			Unit Price (\$)	Q'ty	Total Price (\$)	Place of Installation	Utility	Stete
2,003	Electronic Balance	Roble	LB-300kg	290,000	1	290,000	PECA (San José)	A	Excellent
2,003	Hard Disk		60Gb	81,300	1	81,300	General Administration	A	Excellent
2,003	Hard Disk		80 Gb	99,250	1	99,250	GIS	A	Excellent
2,003	Pentium IV processor	Intel		179,700	1	179,700	GIS	A	Excellent
2,003	Scanner	HP	3570	116,000	1	116,000	GIS	A	Excellent
2,003	Video Capture Target	Pinnacle		114,000	1	114,000	GIS	A	Excellent
2,003	Athlon 2,4 Processor	Athlon		109,500	1	109,500	GIS	A	Excellent
2,003	Notebook Computer	IBM	G40	1,500,000	1	1,500,000	Farming/Cultivation	—	Stolen
2,003	Printer	HP	3820	85,000	1	85,000	Irrigation/Water Resources	A	Excellent
2,003	Notebook Battery	Toshiba	Li-ion	240,000	1	240,000	Irrigation/Water Resources	A	Excellent
2,003	Elemental Analyzer Accesories			2,750,560	1	2,750,560	Soil Management	A	Excellent
2,003	Chromatography Accesories			146,449	1	146,449	Farming/Cultivation (Cauquenes)	A	Excellent
2,003	Printer	Canon	1120	285,000	1	285,000	General Administration	A	Excellent
2,003	Cámara de Presión	RF		542,800	2	1,085,600	Irrigation/Water Resources	A	Excellent
2,003	Pluviometer	Hobo		324,412	3	973,235	Irrigation/Water Resources	A	Excellent
2,003	Lectro DIVER	Eijelkamp		661,626	1	661,626	Irrigation/Water Resources	A	Excellent
2,003	Digital Video Camera	Sony	DCR-TRV60	1,099,990	1	1,099,990	General Administration	A	Excellent
2,003	Sistema Medición de Flujo de Savia		DXN10	3,689,459	1	3,689,459	Irrigation/Water Resources	A	Excellent
2,003	Medidor de DQO y reactivos			2,515,859	1	2,515,859	GIS	A	Excellent
2,003	Monitor	Viewsonic	PF90	271,666	1	271,666	General Administration	A	Excellent
2,003	Gabinete Medium	ATX Codegen	4046-C9	25,071	2	50,142	General Administration and GIS	A	Excellent
2,003	Chromatography Accesories, UPS			2,464,187	1	2,464,187	Farming/Cultivation (Cauquenes)	A	Excellent
2,003	Software Idrisi	Clark Labs	Idrisi Kilimanjaro	719,324	1	719,324	GIS	A	Excellent
2,003	Upgrade de Arcview 3,x arcview 8.3			679,914	1	679,914	GIS	A	Excellent
2,003	Satelital Image SPOT	Spot		2,353,993	1	2,353,993	GIS	A	Excellent
2,003	Máquina Cortadora rotativa	INDEMAF		2,013,389	1	2,013,389	Soil Management	A	Excellent
2,003	Seeder	Cero Labranza	Tiro animal 5Hil.	2,380,000	3	7,140,000	Soil Management	A	Excellent



2,003	Transductor de Presión		WT-500, 500mm	1,078,610	1	1,078,610	Irrigation/Water Resources	A	Excellent
2,003	Photographic Camera	Nikon	N65	299,990	1	299,990	General Administration	A	Excellent
2,003	Tractor	New Holland	5010FWD	10,270,843	1	10,270,843	Farming/Cultivation	A	Excellent
2,003	Desktop Computer	HP	D220 MT	900,000	4	3,600,000	General Administration	A	Excellent
2,003	Digital Camera	Sony	P10	400,000	1	400,000	General Administration	A	Excellent
2,003	Digital Camera	Sony	P72	270,000	1	270,000	General Administration	A	Excellent
2,003	Seeder	Vence Tudo	SA 7300 (7 lines	3,269,892	1	3,269,892	Soil Management	A	Excellent
2,003	Seeder accessories	Vence Tudo		759,808	1	759,808	Soil Management	A	Excellent
2,003	Vibrocultivator	Kongskilde		773,500	1	773,500	Farming/Cultivation	A	Excellent

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Local Cost by the Japanese Side

ANNEX 6

Fiscal Year	2000	2001	2002	2003	2004	TOTAL
General	24,250,000	25,185,501	27,313,946	53,915,610	27,868,909	158,533,966
Specific	10,349,432	18,934,440	40,907,722	47,275,288	76,882,909	194,349,791
<b>TOTAL</b>	<b>34,599,432</b>	<b>44,119,941</b>	<b>68,221,668</b>	<b>101,190,898</b>	<b>104,751,818</b>	<b>352,883,757</b>

Unit: Chilean Peso