REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

ENHANCING RESILIENCE TO CLIMATE CHANGE OF THE SMALL AGRICULTURE IN THE CHILEAN REGION OF O'HIGGINS

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org

ACRONYMS

AGCI	Agencia de Cooperación Internacional de Chile. Agencia pública dependiente del Ministerio de Relaciones Exteriores que capta o entrega y administra recursos de cooperación internacional, tanto entrantes al país como entregados por Chile a países de igual o menor desarrollo.	Chilean International Cooperation Agency. Public agency under the Ministry of Foreign Affairs that channels, delivers and administers international cooperation resources, both incoming and outbound.
ATP - PTA	Asesor Técnico Principal	Primary Technical Advisor
CIREN	Centro de Información de Recursos Naturales. Institución de apoyo al Ministerio de Agricultura que proporciona información de recursos naturales renovables.	Natural Resources Information Center. Support institution under the Ministry of Agriculture that produces information on renewable natural resources.
CNR	Comisión Nacional de Riego. Persona jurídica de derecho público, dependiente del Ministerio de Agricultura, creada con el objeto de asegurar el incremento y mejoramiento de la superficie regada del país.	National Commission for Irrigation. Public institution under the Ministry of Agriculture, with the aim of assuring the growth and enhancement of the country's irrigated area.
CONAF	Corporación Nacional Forestal. Entidad de derecho privado dependiente del Ministerio de Agricultura, cuya tarea es administrar la política forestal de Chile y fomentar el desarrollo del sector.	National Forestry Corporation. Private institution under the Ministry of Agriculture that administers Chile´s forestry policy and promotes sectorial development.
CONAMA	Comisión Nacional del Medio Ambiente. Derogada en enero de 2010 con la creación del Ministerio de Medio Ambiente. Ver MMA.	National Commission for Environment, became the Ministry of Environment (see below) in 2010.
DGA	Dirección General de Aguas. Organismo del Estado dependiente del Ministerio de Obras Públicas que se encarga de promover la gestión y administración del recurso hídrico.	General Directorate of Water. State office under the Ministry of Public Works in charge of management and administration of water.
ECLAC	Comisión Económica para América Latina y El Caribe	Economic Commission for Latin America and the Caribbean
ENSO	El Niño Oscilación Sur	El Niño Southern Oscillation
FAO	Organización de las Naciones Unidad para la Alimentación y la Agricultura	Food and Agriculture Organisation of the United Nations
FIA	Fundación para la Innovación Agraria	Fundation for Agricultural Innovation
GORE	Gobierno Regional. Órgano público encargados de la administración superior de cada una de las regiones de Chile, tiene por objeto el desarrollo social, cultural y económico de la región correspondiente.	Regional Government. Public institution in charge of social, cultural and economic development of a given subnational administrative division called region.
IAG - AMR	Informe Anual de Gestión	Annual Management Report
IIE - EII	Evaluación Intermedia Independiente	Independent Interim Evaluation

IFE - EFI	Evaluación Final Independiente	Independent Final Evaluation
INDAP	Instituto de Desarrollo Agropecuario. Servicio descentralizado dependiente del Ministerio de Agricultura que tiene por objeto promover el desarrollo económico, social y tecnológico de los pequeños productores agrícolas y campesinos.	Institute for Agriculture Development. Decentralised service under the Ministry of Agriculture that aims at promoting the economic, social and technological development of small farmers.
INE	Instituto Nacional de Estadísticas	National Institute of Statistics
INIA	Instituto de Investigaciones Agropecuarias. Corporación de derecho privado sin fines de lucro y dependiente del Ministerio de Agricultura. Es la principal institución de investigación del ramo de Chile.	Agricultural Research Institute. A private not-for-profit corporation that depends upon the Miistry of Agriculture and is the Chilean main research institution in the field.
IPCC	Panel Intergubernamental de Cambio Climático	Intergovernmental Panel on Climate Change
ITA - QSR	Informe Trimestral de Avance	Quarterly Status Report
MIDEPLAN	Ministerio de Planificación (hoy Ministerio de Desarrollo Social)	Ministry of Planning
MINAGRI	Ministerio de Agricultura. Institución del Estado encargada de fomentar, orientar y coordinar la actividad silvoagropecuaria del país.	Ministry of Agriculture. State department in charge of promoting, orienting and coordinating the agricultural and forestry activity in the country.
MMA	Ministerio del Medio Ambiente. Órgano del Estado encargado del diseño y aplicación de políticas, planes y programas en materia ambiental y la protección y conservación de la diversidad biológica y de los recursos naturales renovables e hídricos.	Ministry of Environment. State organ in charge of the design and implementation of policies, plans and programmes in matters environmental and of protection of biological diversity and renewable natural and hydric resources.
NIE	Agencia Nacional de Implementación	National Implementing Agency
ODEPA	Oficina de Estudios y Políticas Agrarias. Servicio público centralizado, dependiente del Ministerio de Agricultura, que presta servicios especializados de asesoría e información.	Agricultural Policies and Studies Office. Centralised service under the Ministry of Agriculture that provides specialised advisory and information services.
PMU - UGP	Unidad de Gestión del Proyecto	Project Management Unit
PNUD	Programa de las Naciones Unidas para el Desarrollo	United Nations Development Program
POA - AOP	Plan Operativo y Presupuesto Anual	Annual Operating Plan and Budget
PRODESAL	Programa de Desarrollo Local (INDAP). Su finalidad es apoyar a los pequeños productores agrícolas y sus familias que desarrollan actividades silvoagropecuarias.	Local Development Programme (INDAP). Its aim is to support small farmers and their families in developing agricultural, forestry and livestock-breeding activities.
SAG	Servicio Agrícola y Ganadero. Servicio descentralizado dependiente del Ministerio de Agricultura cuyo objeto es contribuir al desarrollo agropecuario del país mediante la protección, mantención e incremento de la salud animal y vegetal;	Agriculture and Livestock Service. Decentralised service under the Ministry of Agriculture that aims at contributing to the agricultural development of the country through the protection,

	la protección y conservación de los recursos naturales renovables y el control de insumos y productos agropecuarios sujetos a regulación en normas legales y reglamentarias.	maintenance and enhancement of animal and plant health, the protection of renewable natural resources and the control of agricultural inputs and products that are subject of legal and procedural regulation.
SAT	Servicio de Asesoría Técnica (INDAP). Su objetivo es contribuir a mejorar de forma sostenible el nivel de competitividad del negocio o sistema productivo desarrollando las capacidades de los usuarios.	Technical Assistance Service (INDAP). Its objective is to contribute to the sustainable enhancement in business or productive-system competitiveness through users' capacity development.
SEREMI	Secretaría Regional Ministerial. Es el órgano desconcentrado de los ministerios de Estado de Chile, con la condición de representante del ministerio respectivo en la región.	Regional Ministerial Secretary. It is the subnational organ of State Ministries in Chile, having the condition of representative of the Ministry in a given region.
SIRSD	Sistema de Incentivos para la Recuperación de Suelos Degradados del Ministerio de Agricultura. Ayuda económica no reembolsable destinada a cofinanciar actividades y prácticas destinadas a recuperar los suelos agropecuarios degradados y/o a mantener los suelos agropecuarios ya recuperados.	MINAGRI's Incentive System for the Recovery of Degraded Soils. Non-refundable economic support the cofinances practices and activities that seek to recover agricultural or livestock-breeding degraded soils and/or the maintenance of recovered agricultural or livestock-breeding soils.
UNEA	Unidad Nacional de Emergencias Agrícolas y Gestión del Riesgo Agroclimático. Unidad operativa del MINAGRI que gestiona el Sistema Nacional de Gestión del Riesgo Agroclimático.	National Unit for Agricultural Emergencies and Agroclimatic Risk Management. Operational unit of MINAGRI that manages the National Agroclimatic Risk Management System.
UNFCCC	Convención Marco de las Naciones Unidas sobre Cambio Climático.	United Nations Framework Convention on Climate Change

ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	**REGULAR PROJECT**
Country/ies:	**CHILE**
Title of Project/Programme:	**Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**
Type of Implementing Entity:	**NATIONAL IMPLEMENTING ENTITY**
Implementing Entity:	**AGENCIA DE COOPERACIÓN INTERNACIONAL –AGCI**
Executing Entity/ies:	**MINISTRY OF AGRICULTURE AND MINISTRY OF ENVIRONMENT**
Amount of Financing Requested:	**9.960.000 USD**

Important note: figures in the present document apply the international metric system and use coma (,) for the notation of the decimal marker unless otherwise stated.

Project / Programme Background and Context

Chile: national circumstances

Chile is a tri-continental country with territory that extends along the southwest portion of South America and includes Easter Island in Oceania as well as part of Antarctica to the south. Continental Chile is located between 17° 30' and 56° 30' Latitude South, while Chile's Antarctic Territory covers the area between 53° and 90° Longitude West and the South Pole. It is bordered by the Pacific Ocean along 8,000 kilometers of coastline.

In general terms, Chile has a temperate climate. Due to some variations caused mainly by differences in latitude and altitude, it gives rise to desert, tropical, Mediterranean, temperate, and polar climates, among others. Ecologically, the presence of biodiversity and specific plant formations in a given zone depends on the existing climate.

On the other hand, Chile's population grew quickly in the 20th Century, but growth has slowed in the past decade and is expected to decelerate even more towards the middle of the 21st Century. The total population was last recorded at 17.4 million people in 2012 from 7.7 million in 1960, changing 127 % , during the last 50 years.

The country's development has improved the quality of life of its inhabitants, and in 2010 Chile ranked 45th globally in the United Nations Human Development Index. Since

1990, Chile has experienced rapid economic growth and diversification and increased its reliance on exports. These developments can be explained by the country's stable government, political institutions capable of generating and maintaining consensus on key issues, and effective public policies.

Chilean climate change policies and plans

Under the UNFCCC criteria (article 4, No 8), Chile is considered as a country vulnerable to climate change with respect to its: low-elevation coastal areas, arid and semi-arid areas, afforested areas and areas exposed to deforestation and fragile ecosystems in the Andean and coastal regions.

In 2008 the Chilean Government adopted the "National Action Plan on Climate Change" as the strategic guideline for policy planning and implementation with respect to climate adaptation and mitigation issues. The Action Plan, among others, stipulates the elaboration of adaptation plans for seven key sectors, including the forestry and agriculture sector.

The adaptation plan for this sector has been co-developed by the Ministry of Agriculture and the Climate Change Office of the Ministry of Environment during 2012 and has been officially approved by both Ministries in May 2013. The plan involves 21 adaptation measures several of them are addressed to the poorest and the most vulnerable groups in this sector.

As an implementation strategy for this sectorial plan, the technical workgroups on climate change of the two ministries have identified a series of concrete actions as a "first step" towards the gradual implementation of the whole plan, which financing through the Adaptation Fund of the United Nations Framework Convention on Climate Change (UNFCCC) is subject of this request.

Climate change impacts in Chile

In its second national communication to the UNFCCC (2011) the Chilean Government highlighted the vulnerability of a variety of sectors to the expected future climate scenarios (Fig.1). These scenarios (generated with HadCM3+PRECIS) suggest changes in temperature and precipitation patterns from south to north and from the coast to the Andes:

- Temperature rises are expected between 1°C and 3°C in a moderate scenario (B2) and between 2°C and 4°C in a severe scenario (A2) across the country, at the end of the century.
- Rainfall patterns will change from north to south, resulting in water shortage especially in the central part of the country where 70% of the total population is living and in water abundance in the extreme southern part of Chile.
- Glaciers, which act as strategic water reserves, will continue to retreat.
- Snow storage capacity in the mountain areas will decrease because the increasing temperature will shift the snow-line to higher altitudes.

Rising temperature and changes in precipitation in addition to soil erosion due to storms and desertification processes, will impact strongly in the productivity of the agriculture,

forestry and livestock sector and driving changes in land use patterns along the country. For most of the country, losses in productivity of annual crops are to be expected, especially for non-irrigated lands and also in regions with irrigation restrictions, due to water shortage. Also losses in productivity of vineyards are to be expected in the actual cultivated area, located in the northern and central parts of Chile, due to both, restrictions in water supply and the reduction of the fruit development period caused by higher temperatures.

Regarding pastures and livestock, the seasons for both the sheep and bovine cattle production is expected to change, depending on the geographical area. On the other hand, forest plantation production of *Pinus radiata*, is projected to decrease in the northern and central areas and improve its potential production from the Araucanía Region to the southern areas of the country.

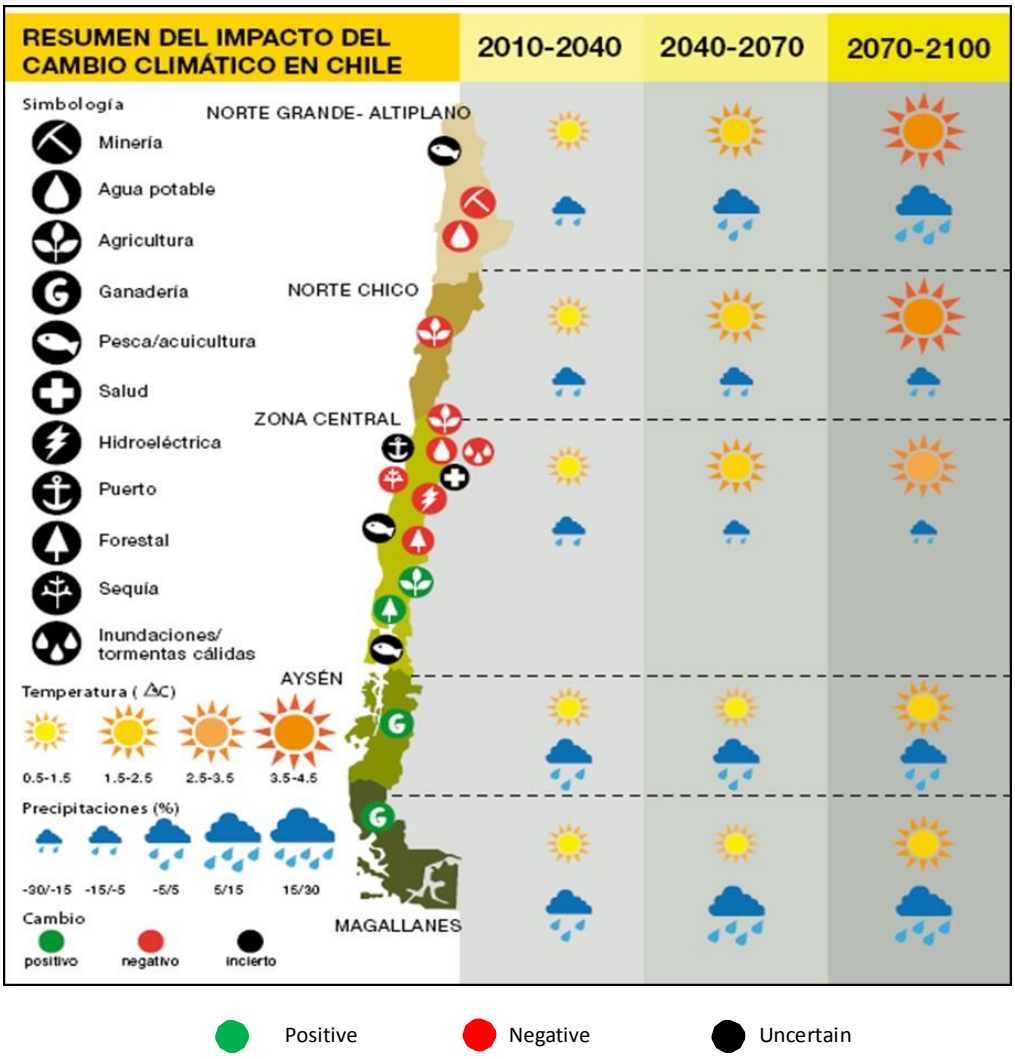


Fig. 1: Summary of climate change impacts on Chile for the period 2010-2100. Second national communication to the United Nations Framework Convention on Climate Change (2011)

Agricultural groups and regions most vulnerable to climate change

Central Region (29 deg. SL-34 deg.SL) , in which adaptation actions are needed in order to avoid or minimize negative climate impacts which threaten agriculture productivity and

livelihood at both ends of the socioeconomic scale.

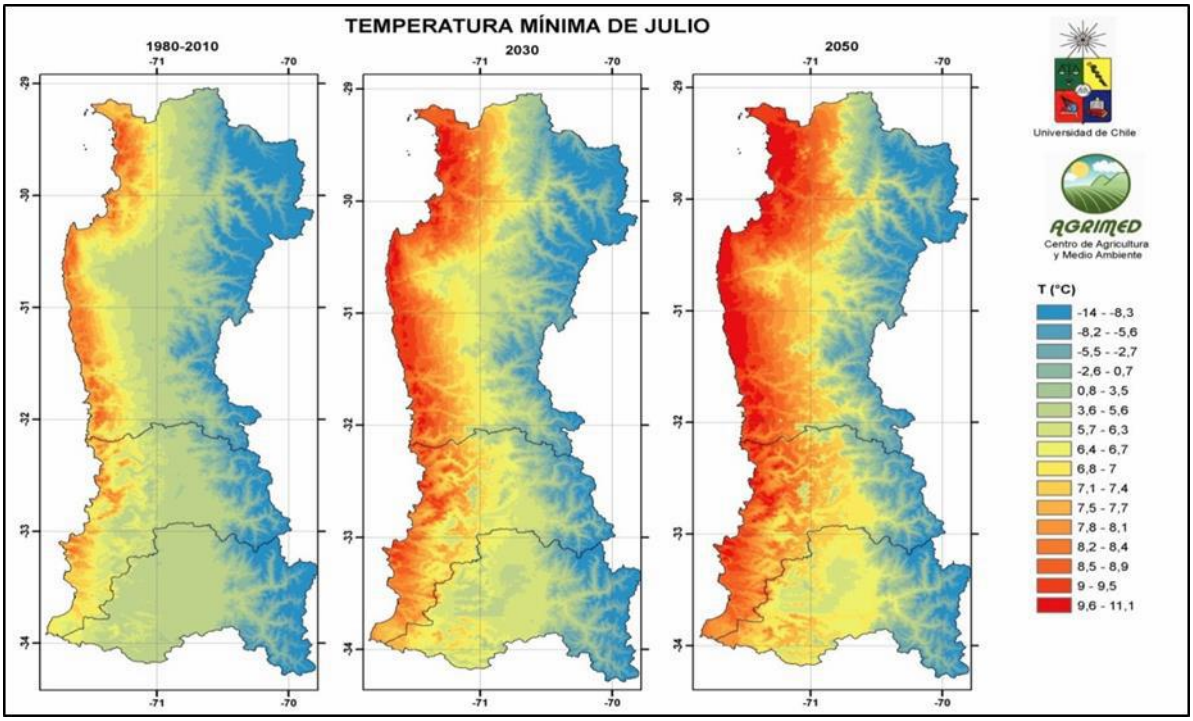


Fig 2: Projections of changes in minimum temperature (during July) and annual precipitation for central Chile; AGRIMED (2013)

Studies[1] (AGRIMED & ASAGRIN, 2011; AGRIMED, 2013; Fig. 2) suggest that the combination of rising temperatures and precipitation decline in this area will increase the process of desertification and soil erosion together with prolonged droughts and heat stress on traditional crops and livestock.

A field study, carried out in 2011 by AGRIMED & ASAGRIN, analysed climate change vulnerability of 20 different agricultural groups from the Aymara population in the north of Chile to the cattle farmers in the Patagonian pampa in the south. Their total vulnerability to potential climate change impacts has been estimated as the sum of 6 specific impacts, caused by: (i) soil erosion, (ii) water shortage in dry areas, (iii) water shortage in irrigated areas, (iv) plagues and diseases, (v) crop development (plant phenology) and (vi) heat stress on crops and livestock.

The results of this participatory survey (Tab.1) show that the most vulnerable groups are: (i) farmers in the dry areas of central Chile between the regions of Valparaíso and Biobío, farmers in the transversal valleys of the regions of Atacama and Coquimbo and the extensive cattle farmers in the dry areas of central Chile (Fig.3). For all these groups, water availability and management has been identified as the key issue related to climate threats, followed by heat stress on crops and livestock.

[1] Portafolio de propuestas para el programa de adaptación del sector silvoagropecuario al cambio climático en Chile, 2011. Centro de Agricultura y Medio Ambiente de la Universidad de Chile (AGRIMED) y Gestión de Agronegocios (ASAGRIN), Santiago.

Plan de acción para la protección y conservación de la biodiversidad, en un contexto de adaptación al Cambio Climático, 2013. Centro de Agricultura y Medio Ambiente de la Universidad de Chile (AGRIMED), Santiago.

N°	Farmer communities or locations	Soil erosion	Water shortage drylands	Water shortage irrigated	Plagues, diseases	Crop development	Heat stress	TOTAL
1	Andean valleys	4	0	2	2	3	4	**15**
2	Aymara farmers of the Atacama region	2	0	0	2	1	0	**5**
3	Irrigated dessert valleys	2	0	2	5	4	5	**18**
4	Andean areas of Limarí, Petorca and Maipo	3	0	5	4	4	5	**21**
5	Transversal valleys	3	4	0	1	4	3	**15**
6	Extensive cattle farmers in drylands	4	5	4	3	2	3	**21**
7	Coastal drylands; regions V to VIII **	5	5	0	4	4	2	**20**
8	Drylands; regions V to VIII **	5	5	0	4	4	5	**23**
9	Fruit farming; annual plants; regions V,VII	1	0	4	4	3	5	**17**
10	Fruit farming; perennial plants; regions V to VII	1	0	4	4	3	1	**13**
11	Grain producers; regions VI-VIII	2	0	4	3	3	4	**16**
12	Vegetable producers; regions V and Metropolitan	2	0	3	3	3	3	**14**
13	Winegrowing; regions VI-VIII	1	0	4	4	3	4	**16**
14	Pre-andean drylands	0	0	0	0	0	0	**0**
15	Forestry; regions VI-X	4	3	0	2	0	3	**12**
16	Non irrigated coastal areas, regions IX-X	3	3	0	2	2	1	**11**
17	Non irrigated areas, regions IX-X	4	4	0	3	2	2	**15**
18	Farmers at the Chiloé island	4	3	0	2	2	1	**12**
19	Andean areas in the regions X and XI	2	1	3	1	1	1	**9**
20	Cattle farmers, Patagonian pampa and Tierra del Fuego Island	4	1	0	1	0	0	**6**
	TOTAL	**56**	**34**	**35**	**54**	**48**	**52**	

** In this regions the project area will be located.

Table 1: Vulnerability to 6 climate change threats for 20 agricultural groups in Chile (AGRIMED& ASAGRIN, 2011)

The numbers of table 1 refer to a scale from “0” (no threat) to “5” (very high threat) and represents the assessment of local farmers and experts who participated in the respective workshops.

The results of an opinion survey, carried out by the Ministries of Agriculture and Environment in 8 Chilean regions in the context of the public consultation process (“Consulta Ciudadana”) of the Adaptation Plan for forestry and agriculture in 2012, showed that most of the proposed actions which have been identified by local agricultural groups as the first step in the implementation of the adaptation plan, are related to water supply and management.

Proposed project area

Based on the above noted findings and complementary studies carried out by the services of the Agriculture Ministry (INIA, SAG, INDAP, CNR, FIA, ODEPA, CONAF) and with the aim to include a variety of agriculture groups, the region of “Libertador General Bernardo O´Higgins” in the center of Chile has been chosen to implement the adaptation measures described in detail in the following paragraph.

The region of O´Higgins includes both, irrigated and non-irrigated agricultural systems managed on an intensive or extensive level either by small scale farmers or by export oriented ones. The Ministry of Agriculture in this region holds a network of services and

already established activities related to capacity building, agro- technology transfer and climate change related research. We can therefore assume that the implementation of the climate change adaptation measures described in the following paragraph are meeting the very needs of that region and will be carried out in a management, evaluation and monitoring appropriate environment.

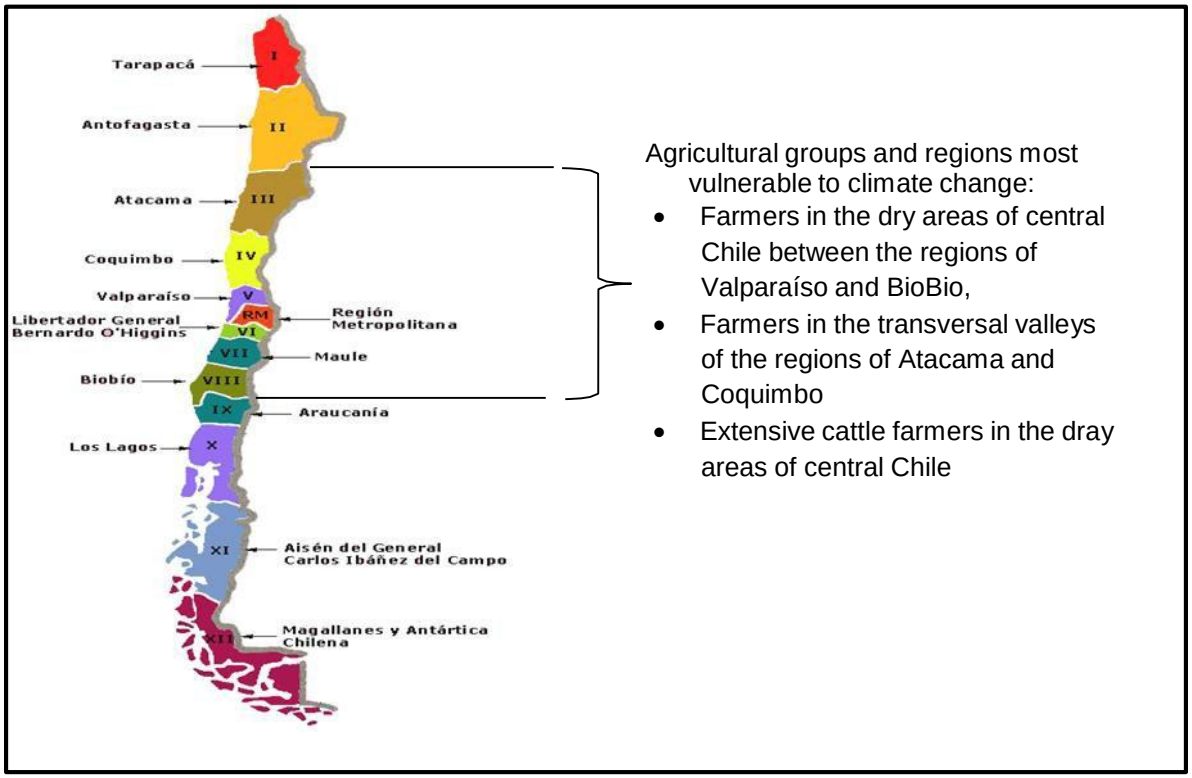


Fig 3: Regions and agricultural groups most vulnerable to climate change

The O´Higgins region (33°51' – 35°01' SL) includes 33 municipalities. Eight of them have been chosen as project area: Paredones, Pichilemu, Marchihue, La Estrella, Litueche, Navidad, Lolol and Pumanque (fig. 4).

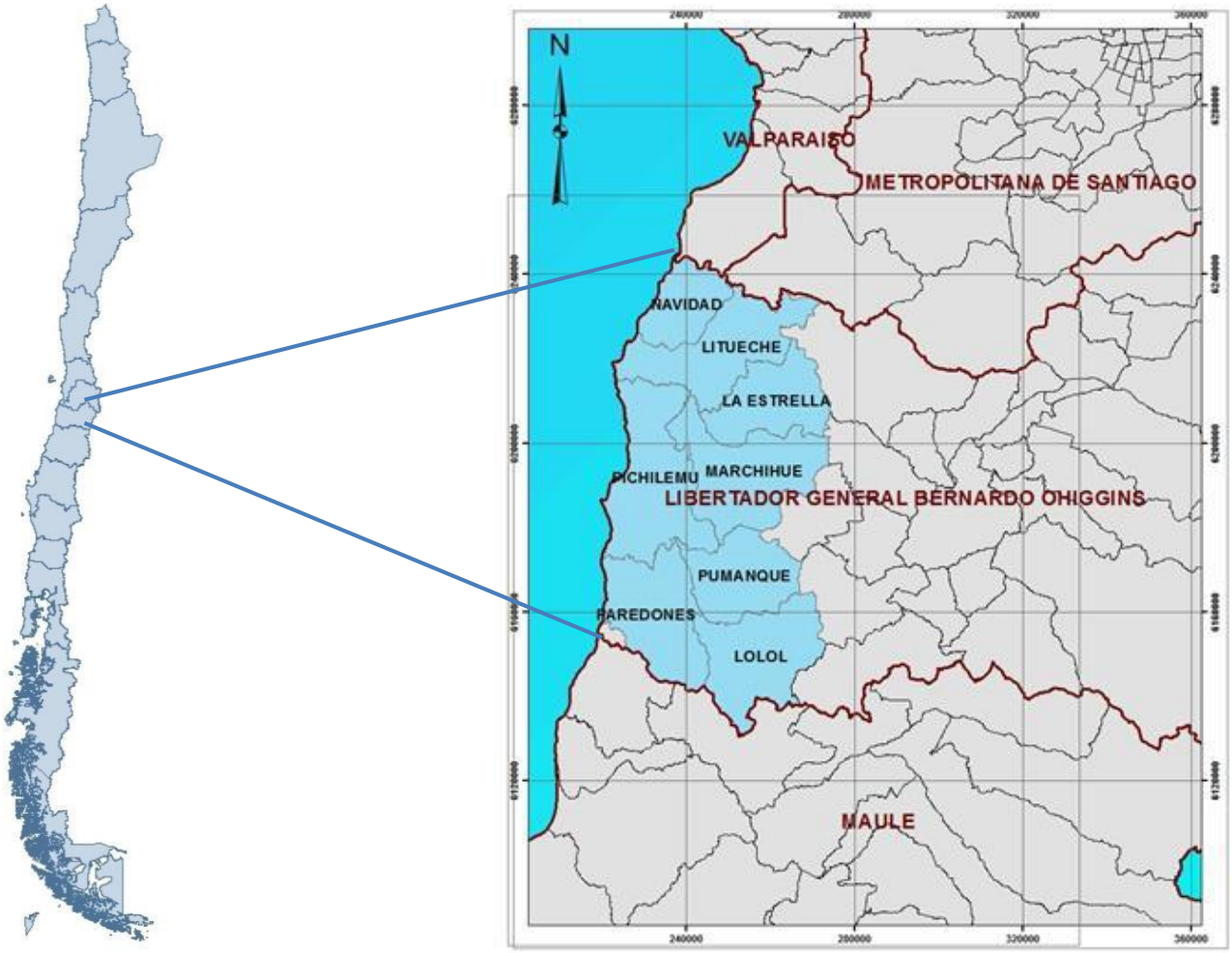


Figure 4: Municipalities in the project area in the O'Higgins region

Climate variability and climate change in the project area

Studies (AGRIMED, 2008) show for a 2040 climate scenario in the project area a 20%-25% decrease in the average annual rainfall and a temperature increase of about 3°C.

Statistics (fig.5) for the commune of Litueche are outlining the decreasing trend in annual precipitation during the last 45 years and highlight the extreme interannual variability in precipitation which varies as an average from 1100mm/year to 500ml/year with frequent extreme periods, when the inter annual differences reaches 700ml and more. This succession of extreme dry and relative wet years, which apparently are related to El Niño (red lines) and La Niña (blue lines) events, is one of the main threats to sustainable land use and water supply in the project area. Considering the current climate, dry seasons in the project area lasts between 6 and 8 months per year and this period will probably increase during the next decades. According to climate change projections, previously mentioned, this region is located among the area that will be most affected by precipitation decreases. Models show a high degree of certainty in this matter. This situation will certainly increase the difficulties that the small farmers of the area actually face, regarding water scarcity and soil degradation. It will affect not only their production, but also the already degraded soil quality, ecosystem services and biodiversity. It will intensify the current problems these populations of small and subsistence farmers tackle,

who are classified among the poorest of the region, exacerbating their poverty situation and increasing their vulnerability to climate conditions.

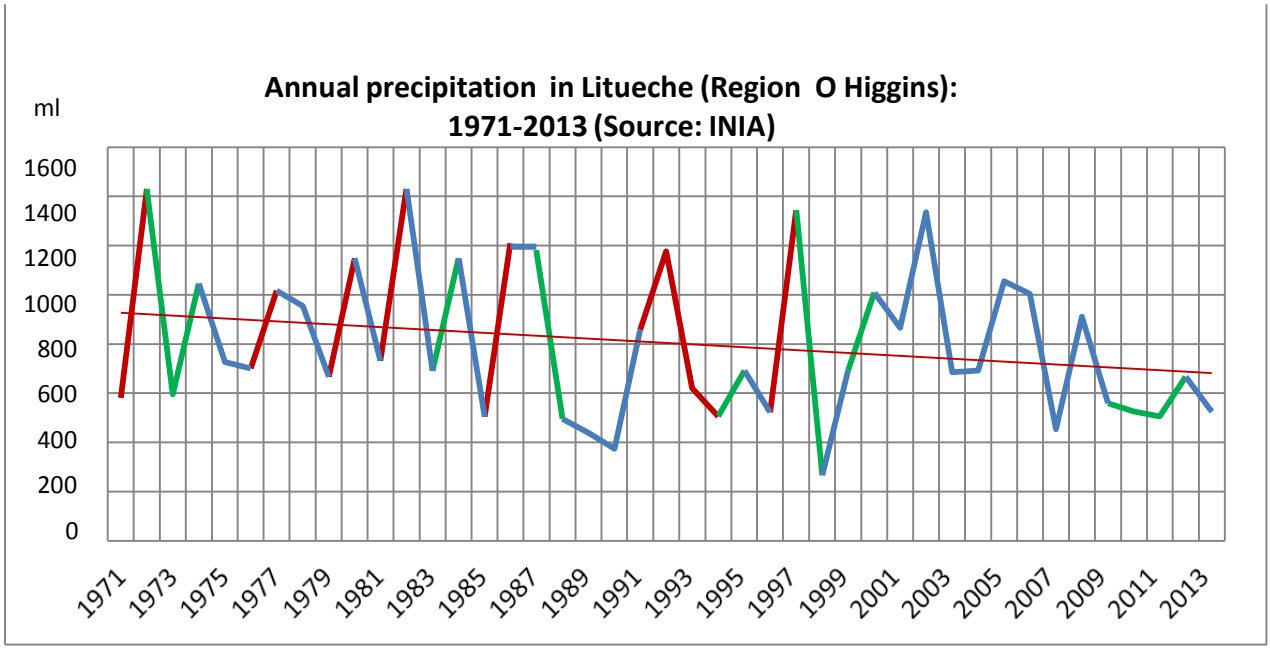


Figure 5: annual precipitation in one of the municipalities of the project area in the region of O'Higgins

Vulnerability to climate change impacts in the project area

The Second National Communication of Chile to the UNFCCC, (2011) indicates for the O´Higgins region a 44% loss in the crop cultivated areas by the year 2040 and a 68% loss in area by the year 2070, assuming an A2 scenario. Highest impacts are on wheat and corn production in non-irrigated land. The results of an extensive study on socio- economic vulnerability to climate change in the 8 municipalities of the project area, carried out by AGRIMED (2008, applying methodology described in Santibañez *et al.*2007) are given in terms of "impacts" in table 2 and in terms of "vulnerability indices" in table 3.

Municipality	Social and productive system impact	Economic impact
Pichilemu	Negative, low	Negative, low
La Estrella	Negative, high	Negative, moderate
Litueche	Negative, moderate	Negative, low
Marchigue	Negative, moderate	Negative, moderate
Navidad	Negative, low	Negative, low
Paredones	Positive	Positive
Lolol	Negative, high	Negative, high
Pumanque	Negative, low	Negative, low

Table 2: Expected impacts of climate change for the 8 municipalities of the project area

With one exception (Paredones), all the impacts related to climate change in the municipalities of the project area are considered as negative and are varying from low to high.

Municipality	FT	IDH	IRU	R/S	UCT	Vme	VSP	VSS	VSE	Cultivated surface (ha)
Pichilemu	0,15	0,68	0,20	0,93	0,07	0,25	0,67	0,26	0,16	2.729
La Estrella	0,19	0,70	0,50	0,81	0,38	0,50	0,54	0,40	0,44	2.225
Litueche	0,15	0,64	0,40	0,84	0,20	0,36	0,60	0,38	0,28	2.760
Marchigue	0,16	0,67	0,60	0,43	0,63	0,75	0,32	0,47	0,69	6.111
Navidad	0,50	0,65	0,70	0,85	0,46	0,47	0,63	0,53	0,47	1.341
Paredones	0,50	0,63	0,60	0,89	0,17	0,32	0,69	0,49	0,25	1.109
Lolol	0,21	0,63	0,50	0,56	0,68	0,76	0,36	0,44	0,72	4.937
Pumanque	0,18	0,64	0,70	0,87	0,40	0,47	0,55	0,53	0,44	1.810

FT = land fragmentation index; IDH = human development index; IRU = rurality index; R/S = irrigation index; UCT =capital and technology availability index; Vme = market accessibility index; VSP =agricultural vulnerability index; VSS =social vulnerability index; VSE = economic vulnerability index

Table 3: Climate change vulnerability indices for the 8 municipalities of the project area

The range for the climate change related vulnerability indices in table 3 is from 0 (zero vulnerability) to 1 (high vulnerability) and varies notably among the municipalities, indicating their special needs with respect to climate resilience building.

Agricultural and social economic characteristics of the project area

Agriculture

The total area size of these eight municipalities is 420 thousand hectares, from which 78% are used for agricultural and forestry activities. The total number of farms in the project area is 5.767, 62% of them are small farms with less than 20 hectares farm size (table 4). The main agricultural activities are sheep cattle, cereal and vegetable production.

A summary of land use and livestock composition is shown in figure 6; details are given in tables 4-7.

Category: Farm Size (hectares)	Number of farms in each category	Percentage over sum	Number of hectares in each category	Percentage over sum	Number of hectares used AF&L*
< 20	3.549	62%	23.006,6	5%	18.970,9
< 50	4.534	79%	54.554,7	13%	44.291,4
50 - 100	599	10%	41.583,4	10%	32.479,5
100- 500	483	8%	98.468,9	23%	75.880,0
> 500	151	3%	225.481,4	54%	174.909,4
Sum	**5.767**		**420.088,4**		**327.560,4**

*AF&L: agriculture, forestry and livestock

Table 4: Farm characteristics in the project area; Source: ODEPA[2], Censo Agropecuario 2007 INE

[2] Available on: http://www.odepa.gob.cl/articulos/MostrarDetalle.action;jsessionid=E9CBBA51B56CEDE828FC92E882863BD0?idn=4534&idcla=12

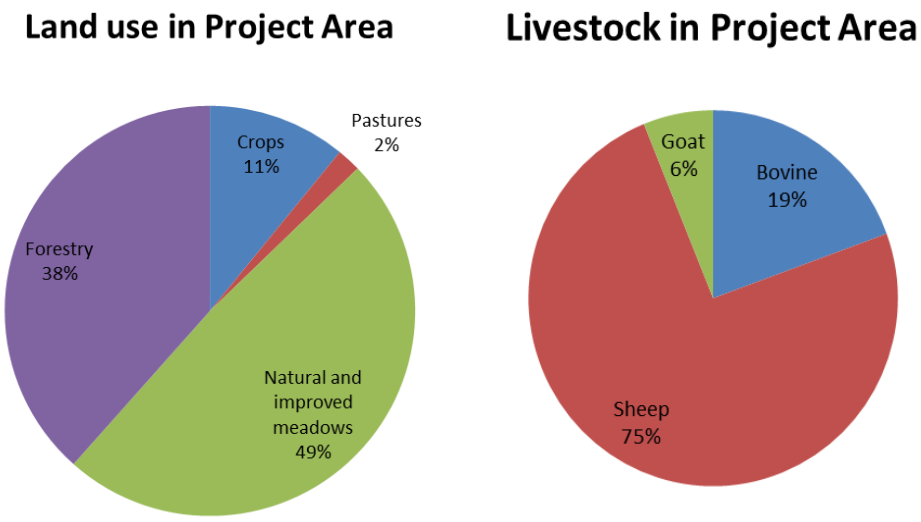


Figure 6: Land use and livestock composition in the project area

Considering the total area size used for agricultural, forestry and livestock activities, 11% of this area is dedicated to crop production, 38% is used for forestry plantations and 2% for livestock pastures. Forty nine percent of the area contains both, natural and improved meadows (table 5).

Production	Area (ha)	Area (%)
Crops	35.681,4	11%
Pastures	6.158,0	2%
Natural and improved meadows	159.681,2	49%
Forestry	125.778,2	38%
Total	**327.298,8**	**100%**

Table 5: Farming characteristics in the project area;
Source: ODEPA[2], Censo Agropecuario 2007 INE

The dominant crops in the area are vegetables (39%) Other crops of economic importance are: grains, fruits, grapes, vineyards and flowers (table 6)

Production	Area (ha)	Area (%)
Grains	4.806,7	13,5%
Legumes	1.078,9	3,0%
Industrial crops	227,1	0,6%
Seedbed	196,2	0,5%
Fruits	4.488,2	12,6%
Grapes and Vineyards	5.663,4	15,9%
Vegetables	13.881,2	38,9%
Flowers	5.339,7	15,0%
Total	**35.681,4**	**100%**

Table 6: Crop composition and respective areas. Source: ODEPA, Censo Agropecuario 2007 INE

The overwhelming part of land used for grain production is in non-irrigated land (≈92%). The varieties of grain crops cultivated are shown in table 7. The most important grain in the non-irrigated area is white wheat while the most important crop in irrigated land is corn.

Cereal type	Hectares under irrigation	Non-irrigated hectares	Production [quintals/hectare]	Number of Farms
White wheat	43,5	3.211,4	66.739	656
Bread wheat	0,0	55,5	1.491	14
Malting barley	0,0	2,6	78	3
Feed barley	0,7	202,4	3.706	79
Oat	39,6	719,2	14.325	228
Rye	0,0	6,6	43	3
Corn	335,4	130,7	32.807	279
Quinua	0,0	58,6	581	27
Other	0,0	0,5	*	1
Total	419,2	4.387,5		1.290

Table 7: Grain production considering species and variety in the project area
Source: ODEPA, Censo Agropecuario 2007 INE

With respect to water management, there are just few facilities of minor size for water storage. In general terms, the small farmers who irrigate their crops, do it at a very small scale and using precarious irrigation systems. Irrigation is used just during a short period of time and depends on water availability (FAO, 2010[3]). Table 8 gives the annual mean precipitation for 6 of the 8 municipalities.

Municipality	mean annual precipitation (mm)
Pichilemu	708
Marchigue	529
Navidad	708
Paredones	859
Lolol	696
Pumanque	696

Table 8: Mean annual precipitation for 6 municipalities of the project area.
Source: Atlas Agroclimático, Santibañez, 2004

Soil erosion and desertification

Caused by non-appropriated forestry and agricultural practices, the upper soil layer has been removed resulting in increased soil erosion. Bad practices both in production processes and overexploitation of natural resources in non-irrigated areas have strongly impacted the zone and are one of the causes of an increasing desertification (FAO, 2010[3]).
In the communities of Navidad, Litueche, La Estrella and Pichilemu, several zones can be identified where overgrazing has generated soil compression, decreasing the level of

[3] "Gestión del riesgo de sequía y otros eventos climáticos extremos en Chile. Estudio piloto sobre la vulnerabilidad y la gestión local del riesgo". FAO Publication, 2010

permeability of the soil during rainfall events and increasing soil loss due to surface runoff.

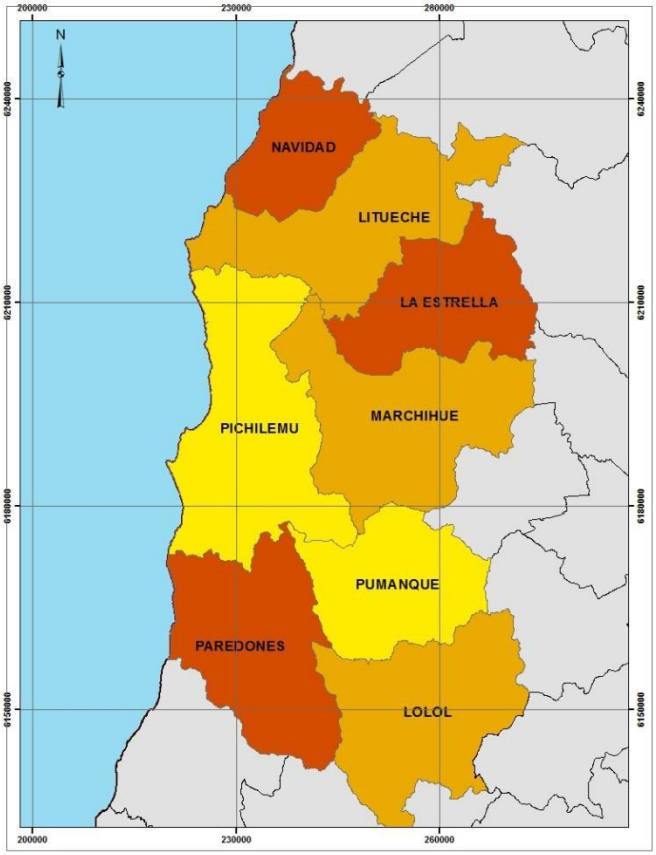


Figure 7: Erosion and Desertification in the municipalities of the project area. Source: CONAF- Programa de Acción Nacional contra la Desertificación / PANCD (2000).

Soil erosion and desertification are serious problems in the project area. The communities most affected by desertification processes are Navidad, La Estrella and Paredones (figure 7).

Livestock

Livestock raised in the projects area belongs principally to sheep cattle, followed by bovines and goats (table 9). Sheep cattle, vegetable and grain production are the main agricultural activities in the project area.

Livestock	Heads (no.)	Heads (%)
Bovine	33.910	19,4%
Sheep	129.972	74,5%
Goat	10.689	6,1%
Total	**174.571**	**100%**

Table 9: Number of heads in each category of cattle production
Source: ODEPA, Censo Agropecuario 2007 INE

Socio-economic characteristics

The target population of the project is the group of subsistence farmers with less than

20 hectares farm size. This group belongs to the rural population of the project area which is of 60% of its total population. This rural population has lower incomes and higher poverty (average index = 16,7%) than the regional and national averages, and unsatisfied basic needs are commonly detected in rural households. The poorest municipalities are Pichilemu (poverty index 17.6%) and Lolol (poverty index 16.7%).

Furthermore, migration of the younger generation, especially women, from its rural homes to the cities has changed the age and gender structure of the remaining population and therefore increased their social vulnera0bility. (PNUD, 2008[4]).

Table 10 shows a summary of some basic socio-economic characteristics of the farmers in the project area, considering issues such as connections to export markets, agro-industries and farmer organizations.

Characteristics	Women		Men	
	Number	Percentage	Number	Percentage
Total of farmers	1562	100%	3426	100%
Linked to export markets	33	2%	97	3%
Linked to agro-industries	25	2%	74	2%
Received financing (2005-2007)	201	13%	789	23%
Received other kind of support	323	21%	938	27%
Belong to a farmer organisation	65	4%	232	7%

Table 10: Social and financing conditions of target farmers in the project area, gender-wise
Source: ODEPA, Censo Agropecuario 2007, INE(Instituto Nacional de Estadistica)

Appropriate use of agroclimatic information requires the strengthening of local capacities

Climate information products and services in agriculture aim to provide a full range of assistance regarding climate, its impacts on crops, livestock and management practices to be followed in order to prevent, reduce and/or manage risks. This tailored information assists farmers in making management decisions to reduce the risks and benefit from the opportunities of a variable climate and enhances their adaptive capacity to climate change.

The Ministry of Agriculture has acquired much experience in this area thanks to instruments like the Agro-Climatic portal (agroclimatico.minagri.gob.cl), the National Agro-Climatic Network (RAN) (agroclimatico.minagri.gob.cl/ran) and the Observatory for agro-Climatic risks (agroclimatico.minagri.gob.cl/observatorio).

[4] Desarrollo Humano en Chile rural (2008). Programa de las Naciones Unidas para el Desarrollo. Santiago.

The RAN network consists of 254 automatic meteorological stations located at relevant sites for agricultural decision making. The Observatory is an Information System that permits to inform and reduce the uncertainties based on three analytical components: learn from the past (historical information), monitoring the present (e.g. drought monitoring) and forecast future scenarios.

Given the complexity of the territory in the project area and the singular characteristics of the agricultural communities in the O'Higgins region, the climate information products and services required for the project area will have to be adapted to the local scale and to the special needs of the farmer communities.

Such a localized climate information service must consider community perceptions, local knowledge, livelihood patterns, vulnerability, gender and reliable communication channels and requires training and capacity building for the end-users with respect to decision making and the correct understanding of agro climate information. It is the component 2 of the project, which addresses this subject of agro climatic information needs.

Project / Programme Objectives

Main objective

To increase the resilience capacity of rural farm communities in the coastal and inner dry lands of the O´Higgins region with respect to actual climate variation and future climate changes.

Specific objectives

To implement a capacity building and training system to increment the resilience capacity of farm communities vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management.
Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region.
To improve the decision supporting agroclimatic information management for actual climate and future climate changes for local MINAGRI professionals and farmer communities.

Project / Programme Components and Financing

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
Component 1.- Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock.		Increased capacity of support institutions and resilience capacity of rural farmer communities to the negative impacts of climate variability and climate change through: (i) Enhanced abilities in soil, livestock, water and crop management. (ii) Access to an agricultural machinery pool for soil management (iii) Increased water supply and crop productivity in 558 farmholds in the project area.	
Result 1.1.- Implementation of a capacity building and training systems to increment the resilience capacity of farm communities vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management.	Output 1.1.1.- Creation of training and advisory teams for agro-technology transfer for each one of the 8 municipalities of the project area, coordinated and supervised by local INIA experts		1.258.630
	Output 1.1.2.- Implementation of 9 demonstration fields for agro-technology transfer (1.1.4, 1.1.5, 1.1.6 and 1.2.8) including its infrastructure and equipment (fencing, water troughs, electrical power supply, etc.): 4-5 hectares in each of the 8 municipalities plus one on INIA ground.		
	Output 1.1.3.- Acquisition (including maintenance and operating costs) of agricultural machinery for the 9 demonstration fields: Tractor, Regenerating pastures machine, Zero tillage seed drill machine, Horrow plow, Chisel plow, Subsoiler plow.		2.945.445
	Output 1.1.4: Training in sustainable soil management: plowing practices, fertilizing practices, soil fertility recovering practices, holistic soil management.		
	Output 1.1.5: Training in the use of crops (wheat, quinoa), forage crops (legumes, graminoids), fruit trees (olives, nuts) and livestock (sheep), tolerant to climate variability and climate change, including the acquisition of seeds, plants and animals.		561.982
	Output 1.1.6: Training in efficient water management on the demonstration fields (including the acquisition of the equipment) through the application of irrigation technology powered by renewable energy resources (sun, wind)		531.725
Result 1.2.- Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region.	Output 1.2.7: Installation of rain water and surface runoff harvesting facilities in 558 farms including training and acquisition of materials and equipment (roof materials, rain pipes, mobile water cisterns, pumps powered by renewable energy resources (sun, wind), greenhouse installation).		3.167.821
	Output 1.2.8: Capacity building through knowledge sharing and good practice demonstrations: · Visits of foreign experts and visits of members of the training and advisory team (1.1.1) to this respective countries. · Guided visits of farmers from the O'Higgins region and neighbouring regions to the demonstration fields of the project area (planned number: 3000 farmers) · Elaboration of manuals and workshops for dissemination of appropriated farming practice		137.649
Component 2.-Installation of an information system for agro-climatic risk management and climate change adaptation.		Improved capacity of the MINAGRI staff in the O Higgins region in agro-meteorological data collection, management,	
Result 2.1.- Improve the decision supporting agroclimatic information	Output 2.1.1. Strengthening of the existing network of automatic meteorological stations (AMS) in the project area:		124.269

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
management for actual climate and future climate changes for local MINAGRI professionals and farmer communities.	· Acquisition of 4 AMS and its installation in to climate monitoring relevant sites of the project area. · Integration of the AMS in the RAN- network, automatic data processing, continuously weather report generation and its dissemination to the local farmer communities.	and climate risk assessment. Improved adaptive capacity to climate change of the farmer communities in the O Higgins region through agro climatic information oriented decision making. Increased agricultural production through "climate clever" decision making. This project component will serve as model for other regions.	
	Output 2.1.2. Capacity building in weather and climate data analysis and its integration in meaningful decision-making for farm management: · Consultancies (i) for the definition of appropriated agro-climatic indicators for water, crop, soil and livestock management in the project area, including software development, installation and connection to the MINAGRI information system and (ii) for the definition of appropriate media and communication strategies and channels for the dissemination of the respective information. · Implementation of the agro-climatic indicator system and the communication strategy through the local INIA office, and dissemination of the respective information to the farmer communities · Training of local INIA staff, farmer advisors and farmers in the understanding of the agro-climatic information and its integration in the decision- making process for farm management and climate change adaptation.		282.479
Project/Programme Execution cost			450.000
Total Project/Programme Cost			9.460.000
Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			500.000
Amount of Financing Requested			9.960.000

Between the presentation of the concept note and of this full project proposal, Component 1 has been divided in two subcomponents without affecting the project's structure of outputs: Subcomponent 1.1 groups activities directed towards the implementation of local demonstrative fields to support the carrying out of training and innovation-fostering activities, and thus includes also the bulk of the training plan, while Subcomponent 1.2 concentrates on individual work with 558 beneficiaries of water-harvesting facilities. This reflects the fact that the two subcomponents respond to different specific objectives and proceed along different implementation dynamics, and so contributes to the clarification of the results framework, while representing no change on the overall or detailed project structure. In order to facilitate the tracking, output numbers have been kept unchanged while the subcomponent identification has been added between component and output identification. Thus, for example, Output 1.7 becomes Output 1.2.7.

Also, a detailed budgeting process has been undertaken, which provides the cost summary provided in the table above and the budget summary and detail in Section III below. All costs are current market costs in Chile during the first half of 2015, obtained through enquiry to three or more providers. Significant cost savings have been possible to obtain in Output 1.1.5, due to the through selection of techniques to be promoted by the project in order to select already-proven, cost-efficient techniques that can presently be found in the project area.

Projected Calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	2015 (2nd semester)
Mid-term Review (if planned)	2018 (1st quarter)
Project/Programme Closing	2019
Terminal Evaluation	2019

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

Component 1: Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock.

It is expected that through component 1 rural farmer communities will increase their resilience capacity to the negative impacts of climate variability and climate change through i) the enhancement of abilities in soil, livestock, water and crop management; ii) access to an agricultural machinery pool for soil management; and iii) an increase of water availability and crop productivity in 558 farm holds in the project area. The Component provides responses to two of the project's specific objectives, therefore being divided in two Subcomponents, the first of which (Result 1.1) tackles farming practices and the second of which (Result 1.2) tackles water availability. The methodology and main features of each component follow.

Detailed baseline

Component 1 starts with the establishment of a detailed baseline including local soils, vegetation and water availability. This is done through UAV photography providing RGB, multispectral, hyperspectral and thermal high-resolution images that allow the establishment of 1:5.000 GIS and cartography. This is then used for the establishment of a comprehensive monitoring system, the final selection of demonstrative units and further work, as well as for works in beneficiaries' farms. Main features of this baseline are:

an initial agricultural diagnosis of the project area and demonstrative units;
parameters to be validated in field works and soil pits; and
elevation models, runoff profiles and soil humidity electromagnetic models

This complete aerial photography mapping is repeated at least once at the end of the project, allowing for full agronomic impact evaluation.

The exploitation of this system allows for the adequate implementation of demonstration

units, for the evaluation of vegetative cover and pastures and cultivated areas and the zoning of the project area in terms of agronomic potential. As mentioned, this allows the full evaluation of the agronomic impact of the applied techniques and the project.

Demonstration units

The project establishes 9 demonstration fields including its infrastructure and equipment (fencing, water troughs, electrical infrastructure, renewable energy sources, etc.) to demonstrate appropriate farm management for climate adaptation and resilience building. One principal demonstration field will be located at the INIA experimental station “Hidango”, in Litueche. The Hidango facility will be the model for all the management practices and technology transfer activities, applied in the 8 project municipalities. The other 8 demonstration fields will be established in each one of the municipalities of the project area: Paredones, Pichilemu, Marchihue, La Estrella, Litueche, Navidad, Lolol and Pumanque. Each demonstration field will cover an area of about 4 to 5 hectares and will be located in an accessible location for smallholders. A contract will be signed between the project and farm owner to detail the responsibilities of both parties. This installation allows for different local soil and climate conditions to be taken into account for the practices that will be demonstrated and transferred in the local demonstration fields (see also table 3).

Different agricultural species are tried in the demonstration fields for their yield in microlocal conditions:

Wheat
buckwheat
pea
quinoa
legume and grass fodder combinations

Adapted species are combined with different practice options:

zero tillage for cereals
subsoiling
pasture regeneration
stubble management
amendments and fertilising

Rain harvesting, storage and utilisation systems, along with greenhouses and renewable-energy systems are installed in the demonstration units, in order to keep a direct link with the beneficiaries and to test, fine-tune and monitor promoted technologies in the same microlocal conditions. A 40 m^2 greenhouse, for the demonstration of vegetable production, and efficient irrigation (drip) are also installed and promoted.

Finally, demonstration units bear also livestock (sheep), for the demonstration of adapted livestock management options, and beehives and equipment for beekeeping, which are provided to selected beneficiaries.

Smallholders benefit through: (i) the installation of the demonstration unit on their farmlands,

(ii) the provision of the corresponding infrastructure, machinery, livestock, crop seeds and plants, (iii) the supervised implementation of climate-adaptation-oriented farming techniques and practices, and (iv) the continuing assistance, training and monitoring through the project's local training and advisory teams.

Monitoring system

Demonstration units are applied thorough a monitoring plan, focused on plant nutrition and showing plant's response to liquid and solid fertilisers, which are selected for being accessible to beneficiaries and eligible for SIRSD funding. Beyond the plant, the demonstration-unit monitoring system measures:

physical, chemical and biological properties of the soil;
results in each applied technique in the management of soil, water and yields;
response to plagues and diseases; and
water stress and irrigation needs, including occasional irrigation of permanent pastures.

Machinery pools

As described in the expected output 1.1.3, the project also considers the acquisition (including maintenance and operating costs) of agricultural machinery for the 9 demonstration fields. This equipment is going to be used for works on demonstration fields and also as a machinery pool at the disposal of registered and eligible small farmers in each municipality.

Small farmers, both direct beneficiaries of other project outputs and others qualifying (vulnerable small farmers) register in a machinery-pool applicant list. The Local Committee (see Part III) then organises the calendar for machinery utilisation outside the demonstration fields, considering the registered necessities. The requirements and employment of machinery by small-farmers are coordinated and monitored by the technician in charge of each demonstration field. Correspondingly, a mechanism will be established to authorize the use of machinery outside the demonstration fields.

Machinery types and justification for its use to enhance adaptive capacity to climate change can be found below:

Subsoiler: this implement is ideal to plough soils on non-irrigated and dryland areas. The tool works between 35 to 45 centimetres under, allowing the rupture of compacted soil layers or hardpan. This action contributes to reducing runoff and erosive processes due to sediment dragging. It improves water accumulation in the soil profile, enhancing root growth and vegetable cover such as grassland for animal feeding and others. It progressively improves physical and biological soil conditions, increasing organic matter amounts.
Chisel plough: likewise the subsoiler, but this plough works between 20 and 30 centimetres under. Crucially, both do not disrupt the soil profile.
Vibrocultivator: implement used for one-off seedbed preparation and non-chemical weed control for vegetative-propagation weeds
Stubble cultivator: the implement is used for the incorporation of stubble into the soil.

Offset disc harrow: the implement is used for liming and the incorporation of organic amendments or stubble into the soil.
Zero tillage seed drill machines: it allows direct seeding. The zero tillage method aims at enhancing and sustain farm production, conserving and improving soil, water and biological resources. The crops considered for zero tillage seeding are wheat and oat. The use of these machines permits sowing under the stubble of previous seasons. This action reduces erosion and damage to the soil structure, fostering natural fertility and improving physical, chemical and biological characteristics over time. Finally, with this method, production and yield improve. Zero tillage also contributes to keep carbon and humidity inside the soil profile, reducing CO_2 emissions and preserving water accumulation.
Pasture regenerating machine: allows direct seeding of pastures, with a minimum impact on soil similar to the zero tillage seeding drill machine: reduces erosion and damage to the soil structure, fostering natural fertility, improving physical, chemical and biological characteristics over time and contributing to keep carbon and humidity inside the soil, reducing CO_2 emissions and preserving water accumulation.
Manure spreader: the equipment is used for organic amendments.
Sprayer: the implement allows the application of organic amendments and the removal of invasive plants.
Wheat/Quinoa seeder: specific equipment that allows efficient and optimal seeding of promoted yields.
Stubble chipper: it facilitates the incorporation of organic material to the soil by increasing the contact surface.
Backhoe: it allows small conditioning works to be made efficiently.
Tractor: with a minimum power of 115 hp (86 Kw).
Small truck: allows the displacement of machinery pools (medium haul).
Flatbed wagon: allows the displacement of machinery pools (short haul).
Oil tank and manual fuel pump.
Manual hay baler: proven yet unaffordable technology in the project area, to be incorporated into machinery pools. It is sought for baling forages.
Honey extractor: extracts honey from honey combs without damaging the combs, thus allowing them to be reutilised. Honey extractors are available within machinery pools, but without being moved from the demonstration unit.
Strawberry picking assistant: the non-motorised equipment, originally developed in different versions for strawberry picking, can also help plant, weed and other agricultural tasks.

Work in beneficiary farms

The expected output 1.2.7 refers to the Installation of rain water and surface runoff harvesting facilities in 558 farms including the acquisition of materials and equipment (roof materials, rain pipes, mobile water cisterns, irrigation system, greenhouse installation) and training by the advisory teams in the use and maintenance of this facilities. This deliverable clearly improves climate adaptation and resilience building with respect to increasing water shortages and climate uncertainty and improves farm productivity in the 558 most vulnerable smallholder farms in the project area. Rain harvesting systems and irrigation materials lifetime is at least 15 years, according to their technical specifications. Each farmer will be responsible for the maintenance of her/his infrastructure. They receive proper technical support and training on the collection of water resources, storage capacity management, cleaning processes and preservation of pipes, seals and

other parts.

The usefulness of several alternatives of rain harvesting, storage and utilisation has been researched by INIA on farms located in the O'Higgins Region. The results of these investigations show that it is possible to collect and storage an important amount of rain water for agriculture and human consumption (for human consumption, a system to filter and purify the water is included). Five hundred and fifty eight (558) small-farmers and their families (more than 2.000 individuals) benefit from these systems that allow having fresh water for human and animal consumption and for agricultural production through the irrigation of small vegetable areas or greenhouses. During the last 5 years several alternatives of rain water harvesting and storage have been studied and new technologies have been proved in other countries, for example the use of movable tanks is a new alternative. The knowledge of rain harvesting has been increasing in the country. There are suppliers and companies capable to install and provide maintenance services for the systems at scale. An increasing interest has developed in the region for rain harvesting systems due to the results of pilot experiences. The project plans dissemination of results through the technology-transfer teams and further knowledge management activities.

On the other side, regarding the use of solar energy for irrigation systems, this alternative has been very successful on rural areas because it has no costs associated to energy consumption. Pumping bombs powered by solar energy are used in the country with very good results. The power generated by solar energy is enough to lift water for irrigation systems such as those ones planned by the project. Other alternatives, for example electricity and oil, have higher costs of consumption. Furthermore, electricity is not always available for some rural areas, due to the lack of infrastructure and oil is not a sustainable alternative, and to promote its use will be in contradiction of climate change mitigation. The challenge about solar energy systems is its high initial investment costs. The project helps to further improve the conditions of the small-farmers providing the necessary funds for this initial investment in 100 cases, those who can most benefit in terms of resilience. It is expected that the capacity building activities of the project, the dissemination of lessons learned and a continuation in the price drop of the equipment will motivate the support of more solar energy systems for future projects.

As a result of the activities previously mentioned, the availability of water for efficient consumption is ensured for the 558 small-farmers, their families and their agricultural requirements, for a long period of time, thus augmenting their resilience in uncertain, but for sure worse, climate conditions.

Training

The agro-technology transfer concept of the Project focuses on facilitating that farmers, together with the local training and advisory teams, generate the expected concrete outputs 1.1.4, 1.1.5, 1.1.6, 1.2.8 and 2.1.2 within a comprehensive training strategy (see below). The capacity building plan and the management structures provided for it are further developed in annexed Capacity Building Plan and Part III.

Training activities are organised from the identification of two different target groups: project beneficiaries (farmers) and technical staff directly linked to the project and its beneficiaries

and area. The project establishes an orderly, systematic and adaptive communication system to ensure the fulfilment of the following objectives:

- to allow and assure efficient and effective communication between different institutional and non-institutional actors;
- to provide flexibility while keeping the communication plan able to be monitored; and
- to establish channels that allow for both the dissemination of new practices and useful information and the feedback of users' information and perceptions.

For the execution of training activities 1.1.4, 1.1.5, 1.1.6 and 1.2.8, there will be 8 local training and advisory teams for agro-technology transfer for each one of the 8 municipalities of the project area. These teams are composed of the local technical-assistance providers from different MINAGRI institutions plus the municipality and a representative of the demonstration field, supported by a local technician hired by the Project, and receiving coaching and technical advise from the project through INIA.
The responsibilities of these local technicians are:

- to support joint programming and to manage agricultural labours and training activities at the unit and commune;
- to establish and update a list of beneficiary small-farmers, and to identify their detailed conditions, capacities and needs, in order to fine-tune activities;
- to coordinate a monthly and yearly schedule of activities to be developed in the demonstration field for agro-technology transfer;
- to keep constant communication with small-farmers in the municipality;
- to coordinate a monthly and yearly schedule of activities to be developed outside the demonstration field, in farmlands;
- to coordinate all other issues related to the project at the local level.

The 8 teams will be coordinated and supported by INIA, the project management unit and the Project Director. The training activities of these advisory teams focus on three main subjects:

Training in sustainable soil management: ploughing practices, fertilising practices, soil-fertility recovering practices, holistic soil management.
Training in the use of crops, forage crops, fruit trees and livestock tolerant to climate variability and climate change.
Training in efficient water management and water harvesting and storage on the 9 demonstration fields and on 558 smallholder farms in the project area.

Special consideration is going to be made regarding the vegetable and grass hydroponic production, for family agriculture farming and use of rain water from harvesting systems. Another subject to address by the capacity building is the clean reproductive management and nourishing of sheep breeds adapted to water scarcity conditions. The target groups of on-farm technical support include the entire farm family, including women and teenagers in the smallholdings where the demonstration fields are located and in general, interested farmer families in the entire project area of the O´Higgins region.

Direct training activities are going to take place for at least 2,200 small- farmers on the project area. As the target population additionally considers rural schools and small-

farmers' families and taking into account the characteristics of these rural communities, around 10,000 people will be benefited from the activities previously mentioned. The training activities will be supported by the elaboration and dissemination of didactic materials, including manuals describing appropriated farm management methods and techniques and the realization of respective workshops and events.

Furthermore, a strong training-of-trainers set of activities is also to take place, along with an important effort in the diffusion of best practices for replication purposes, both within the O'Higgins region and neighbour regions of Valparaíso, Maule and Coquimbo.

The Direct Training of Beneficiaries considers:

- Soil and water conservation techniques
- Visit: soil and water management under semi-arid conditions in the Brazilian North-East
- Water harvesting, storage and efficient use
- Adapted production of secano crops
- Adapted technical irrigation systems
- Technical visit: vegetable production systems using recirculation in semiarid conditions
- Adapted sheep rearing systems
- Adapted pasture management

The Training of Trainers activities consider the following issues:

- Characterising and classifying water sources and vegetation from drone photography
- Soil classification for the *secano* area. Agronomic studies and edaphologic classification
- Soil micromorphology studies and cultural soil profile
- Dissemination and replication of soil and water conservation techniques
- Diploma in water harvesting and storage system design
- Regulation and maintenance of agricultural machinery
- Regulation and maintenance of tractors
- Topography
- Technical visit: water and soil management and agroclimatic risk management under semi-arid conditions
- Conservation management techniques for soils and water aimed at operators of the SIRSD programme.
- Technical visit: technical water and soil management and agroclimatic risk management in Mediterranean conditions

The planned overseas tours have been reduced to the strictly necessary minimum to ensure the quality of training to be provided to farmers. In two cases (EMBRAPA Petrolina, Brazil and Almería, Spain), the tours include the participation of signified farmers in the respective fields of soil and water management (most probably demonstration unit holders) and vegetable production (with harvested rainfall), intended as an incentive for exemplary project participants to keep "trail-blazing" in their respective fields of excellence.

This information is included in Annex 2: “Capacity development and knowledge management plan”

Component 1 includes diffusion activities with farmer communities from other Chilean regions with similar social and agroclimatic characteristics and needs for improving farm management skills, as well as knowledge sharing and good practice demonstrations from leading agricultural experts and institutions. In this context, the project will organize “field days” to the demonstration sites. These organized visits will promote a participatory “learning by seeing” process with a view to replicate results and good practice on a wider geographic scale.

The agro-technology transfer and capacity building activities of Component 1 will furthermore provide synergies with three already existing MINAGRI programs in the region: PRODESAL (local rural development program), SAT (technical assistance service) and SIRDS (Incentive system for sustainable agricultural soil management).

To achieve the desired synergies between the Project and the MINAGRI programs and to strengthen their joint impacts on rural capacity building and climate change adaptation, a cooperation agreement will be signed.

It is expected that through the knowledge and agro-technology transfer (including the provision of climate change adapted crops and animal breeds) small farmers will build capacities and develop better practices to: increase agricultural production, to improve soil moisture and reduce the vulnerability of soils to erosion and degradation and learn how to make an efficient management of water resources through mechanized irrigation, water harvesting, recirculation of water and greenhouse growing techniques

As a direct result of the project, areas under technified irrigation and within greenhouse are expected to increase. Furthermore, small farmers will have the possibility to cultivate new crops, which was not possible before, due to the lack of water or its inefficient management. INIA has developed varieties resistant to water and thermal stress that are made available at scale through the project.

Synthesis of the Capacity Building Plan

Activity	Instructor	Target audience	Duration (days)	Course editions (number)	Participants (total)	Year 1	Year 2	Year 3	Year 4
Direct training									
Soil and water conservation techniques	INIA or project professional	Beneficiaries		8	488				
Technical visit: soil and water management under semiarid conditions in the Brazilian North-East	EMBRAPA Semiárido, Petrolina, Pernambuco State, Brasil	6 farmers, 2 professionals	8	1	8				
Water harvesting, accumulation and efficient use	INIA or project professional	Beneficiaries		8	488				
Adapted crop management	INIA or project professional	Beneficiaries		8	488				
Adapted irrigation	INIA or project professional	Beneficiaries		8	488				
Technical visit: vegetable production in semiarid conditions	Universidad de Córdoba, Almería, España	3 farmers, 1 professional	10	1	4				
Adapted sheep rearing	INIA or project professional	Beneficiaries		2	122				
Adapted pasture management	National consultant, INIA or project professional	Beneficiaries		2	122				
Subtotal direct training				**38**	**2.208**				
Training of trainers									
Characterising and classifying water sources and vegetation on aerial photography	National consultant	Professionals and technicians		1	13				
Soil classification	National and international consultants	Professionals and technicians		1	13				
Soil micromorphology and soil profile	International consultant	Professionals and technicians		1	13				
Diploma on water harvesting and accumulation systems	Escuela de Postgraduados, Universidad de Chapingo, México	2 project professionals	12	1	2				
Regulation and maintenance of agricultural machinery	INIA professional	Demonstrative units staff, professionals and technicians		2	26				
Regulation and maintenance of agricultural tractors	INIA professional	Demonstrative units staff, professionals and technicians		1	13				
Field topography	National consultant	Professionals and technicians		1	13				
Technical visit: water and soil management and agroclimatic risk management under semiarid conditions	INTA, Salta and Santiago del Estero, Argentina	3 professionals	6	1	3				
Soil and water conservation techniques	INIA professional	SIRSD operators		3	39				
Interpreting agroclimatic indicators for decision-making	Company consultant	Project and institutions professionals and technicians, SIRSD operators		3	117				
Technical visit: water and soil management and agroclimatic risk management in Mediterranean conditions	University of Melbourne, Australia	3 project professionals	10	1	3				
Subtotal training of trainers				**16**	**255**				
Diffusion and replication									
Field day at demonstration unit	Project professionals and technicians	Beneficiaries, local and neighbour-region producers, agricultural schools		36	3.096				
Soil and water conservation techniques	INIA professional	Neighbour-region professionals and technicians		3	39				
Subtotal diffusion and replication				**39**	**3.135**				
Total capacity building				**57**	**5.598**				

Component 2: Installation of an information system for agro-climatic risk management and climate change adaptation.

The main goal of Component 2 is to strengthen the National Agro-Climatic Network (RAN, see p.17) in the project area, in order to improve its products and to make them available on a regular basis for climate hazard- and climate change-related decision making by the farmer population.

In this context (expected output 2.1.1, table 11), the project acquires and installs 4 automatic meteorological stations (AMS) for relevant sites of the project area and will enable their data transmission and automatic processing through to the RAN-network , including the elaboration of weather reports and forecasts and its dissemination to the local farmer communities. The 4 new AMS will be located in the municipalities of Navidad, Pichilemu, Paredones and Pumanque.

Component 2 (expected output 2.1.2, table 11) also considers capacity building in weather and climate data analysis, the development of farm management appropriated indicators and its integration in meaningful decision-making, through the following activities:

- Consultancies:

(i) For the definition of appropriated agro-climatic indicators for water, crop, soil and livestock management in the project area, including software development, installation and connection to the MINAGRI information system.

(ii) For the definition of appropriate communication strategies and media channels for the dissemination of the climate information.

- Implementation of the agro-climatic indicator system and the communication strategy through the local INIA office, and dissemination of the respective information to the farmer communities, through proper channels in straightforward language.
- Training of local INIA staff, project staff, advisory teams and farmers in the correct interpretation of the agro-climatic information and its integration in the decision- making process for farm management and climate change adaptation.

The media and communication strategies consider the special characteristics and needs of the small farmers, their families and their communities, and are integrated in the wider Capacity Building Plan. Training in the use of agroclimatic information is incorporated in all direct training and training of trainers activity from its availability during year 3. Adoption is expected to be very quick and widespread (way beyond direct beneficiaries) as a result.

The Component also includes the elaboration of diffusion materials for the target population: small farmers (men and women), adolescents, students from farm schools, etc., as well as the training of professionals and technicians in the interpretation and use of the provided agroclimatic information so they can provide adequate support to the implantation of the agroclimatic information system. The emission of bulletins, climate forecasts and alerts keeps established with project investment and then on.

It is expected that through the Component 2, i) the local MINAGRI Institutions will strengthen and improve their technological and methodological capacity in climate data sampling, processing and analyses, and ii) the rural farmers communities will increase their resilience capacity to the negative impacts of climate variability and climate change through climate-wise decision making.

Because of its innovative character, it is assumed that the successful implementation of Component 2 will serve as a model for climate change adaptation oriented farm management.

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

The economic, social and environmental benefits of the project have been resumed in the following two tables. Table 11 shows the direct benefits considering the small farmers and specially women. Table 12 shows how the present situation is expected to improve through the two project components.

	Benefits		
	Economic	Social	Environmental
Small farmer (in general)	Increase in productivity results in higher incomes and generates competitive market advantages.	Increased live quality due to higher incomes and improved water supply. Avoidance of rural exodus because of: Improved opportunities for the younger generation and strengthened family ties due to the family integrating “learning by doing” approach of the agro-technology transfer process.	Reduction of soil loss and desertification processes due to increased water resources availability and improved irrigation techniques. Avoidance of ecosystem degradation through holistic farm management.
Women	Additional incomes from greenhouse and small animal production due to the increased availability of water resources from rain-harvesting and storing systems.	Increase economic benefits through more involvement of women in farm production will strengthens their role and participation in farm management decision making.	Women are more likely than men to adopt eco-friendly sound decision making. The strengthened position of women in farm management will have positive implications on the environmental consciousness building process at family level and will result in more

			environmental friendly farm practices.

Table 11: Economic, social and environmental benefits of the Project

Present situation	**Expected Project Benefits**
Small farmers face water scarcity from November to April.	Small farmers are better prepared for the dry seasons because of the support and capacity building in the use of rain water harvesting and storage facilities and more efficient irrigation techniques
Small farmers and their families receive water in tankers from the local municipality. However the amount of water distributed during the dry season is hardly enough to satisfy basic needs and insufficient to maintain water dependent agricultural activities.	The installation of rain water harvesting and storage facilities at 558 small farms will increase water availability for these families and allow to maintain water dependent farming activities even during dry seasons.
The younger generation migrates from the family farms to the cities for searching better economic and employment conditions and life quality. The average age of the small farmers at the project area is 52 years and they are not very open minded for changing conservative farming practices and apply new and innovative options.	The younger generation is more likely to adopt new and innovative farming practices and technologies which increase economic benefits and life quality. This will lower the rural exodus and contributed to farm modernization and more business oriented farm management.
Small farmers have very limited connections to agro-industries and very low participation in farmer organizations (see Tab.10).	The participative learning and training approach of the Project which includes guided visits of 3000 farmers to the demonstration sites will increase the inter-farmer communication and their readiness to join existing farmer organizations or create new ones and increases their connection to the agro-industries sector.
Increasing soil degradation and fertility loss due to erosion processes.	Soil degradation will decrease due to the application of soil recovering and conservation methods and appropriated land and pasture management.
Limited crop and pasture production due to poor soil moisture and water storage capacity of the upper soil layer.	Increased soil moisture and water storage capacity due to better soil management. Increased crop and pasture production due to adequate land management and the use of appropriated equipment (e.g. zero tillage planter)
Low climate adaptation capacity of small farmers because they have no access to crop	

Present situation	Expected Project Benefits
varieties and livestock races which are better adapted to climate change and extreme climate conditions. Small farmers do not have appropriate access to agro-climatic information and are not trained in applying this information for agro-management decision making. Low level of technical and financial support through government aid programs (Tab.10) due to lack of information and low capacity to accede to this programs.	Increased climate adaptation capacity because the Project provides crop varieties and livestock races better adapted to climate change and extreme conditions. The project generates and disseminates on a regular basis appropriated agro-climate information for farm management and trains farmer communities in its correct interpretation and application for climate-smart decision making. Small farmers are better informed about technical and financial support options and have improved abilities in the filing of the respective applications.

Table 12. Present situation in the project area and expected project benefits

Note: The project does not present any risk of marginalization of minority groups or indigenous people.

It is very difficult to estimate ex ante the improvements that will be produced by training and enhanced technical assistance, access to machinery or improved weather information and alerts, although the project plans its thorough monitoring during the execution.

In terms of water availability, the project puts water harvesting facilities and 5400-litre tanks (plus shared access to portable 10000-litre tanks) at the disposal of 558 vulnerable farmers, who on average will be able to fill their tanks with 20.000 -40.000 L during the crop season, accordingly to previous experiences. Given that the collected water is to be used under drought conditions, the comparison must be made against zero water availability. With these systems it is expected that 558 farmers will produce vegetables under greenhouse with the economic benefit of new incomes: around USD 1000 during the season.

Improvements in soil fertility due to improved practices are not feasibly measured during the project's 4-year lifespan. Nonetheless, considering that the area covered by the farms - 2208 beneficiaries, with at least 691 women- is around 20.000 hectares and due to the incorporation of practices from the capacity building activities and an increased access to machinery and technical assistance, it is expected that around 5000 hectares will improve their soil conditions such as organic matter, soil structure, humidity, fertility, etc. This represents another economic benefit estimated in USD 1000 more, during the season.

The project provides 2208 vulnerable farmers and their families with substantial opportunities for the enhancement of their livelihoods on site: access to machinery, access to new techniques, alerts and weather information for decision making, new incomes, and 558 among them (at least 318 women) will improve their water security.

Besides, it also provides substantial opportunities in terms of sharing experiences, learning and organising with neighbours for joint undertakings. Thus, the project tackles both objective and subjective reasons of rural exodus. Since the project is to be in close contact with the full 100% of vulnerable farmers in its 8 municipalities, the monitoring of this through surveys, which are planned yearly, is complete (see CDKM Plan, Annex 2) The surveys will include special questions about family member presence and participation in the Project.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

A main output of the project is the implementation of nine demonstration fields for agro-technology transfer. Eight of these fields will be located at farmers' property at the local (municipal) level and one on INIA ground. There is no need therefore to buy or rent these facilities or for expenditures for special surveillance measures. The infrastructure facilities on these fields will not be removed by project end.

Other alternatives for demonstration fields and machinery pools considered included the direct provision of machinery to vulnerable population, which was discarded for the reduction in scope it would cause (dozens of farmers could benefit from that approach, instead of more than two thousand with the adopted pool approach)

The new crop varieties on the demonstration field will be distributed cost-free to the farm owners. If any, the economic benefits of the yield belong to the farmers. The development and test of varieties has already been developed by INIA. The agricultural machinery pool of the project will be available cost-free to the small farmers of the project.

The output 1.1.7 under Component 1 – Result 1.2, which consists in the installation of rain harvesting systems on 558 smallholdings, is the best way for the small farmers to have access to cost free water resources. The Chilean legislation is based on water rights for the use of water for an economic activity. To buy water rights and to install the corresponding dwelling and transport facilities, which needs a special permission from the General Directorate of Water, is too expensive for the small farmers of the project. Rain water however can be freely collected and utilised, so that the farmers do not need economic resources or special permission to use this vital resource. The installation of these facilities is cost-free for the farmers. For these reasons, wells and reservoirs were considered, but discarded. The aquifers on which the project area lays are officially considered saturated by the Water Directorate General of the Ministry of Public Works. As per reservoirs, and given Chile's legal system for water, water rights should have been bought from utilities and other big owners of them, making it also impossible for the project to reach the desire scope. Water legislation in Chile, indicates that owners of farms can use freely the rain water that falls and can be collected inside their farms (Water Code, 1981, article 10)

The agro-climatic information system of the project will be integrated in already-existing national agroclimatic information frameworks. The continuous dissemination of the respective agro-climatic information products for farm management will be cost-free.

For the intensification of the RAN network in the project area in order to build the information and warning system, an alternative would have been to build an entirely new, independent network. That would have meant that no integration or comparison would have been possible outside of the system, and for such reason the option was discarded.

There are scant feasible alternatives for providing support to the target population in adapting to climate change and climate uncertainty by means different to the ones provided for in this project. The *dryland* has been a worry of the Ministries of Agriculture and Environment for years, and support has been provided to the maximum possible extent through the available means for these government branches in charge of rural sustainability. Nonetheless, these efforts are unable to overcome the combination of climate change and existing socioeconomic and market conditions that threatens the sustainability of the target households, the most disadvantaged in the area.

For equipment, vehicles and other resources that could be either bought or leased (ie. those not included in machinery pools, which by definition are to be acquired), a sourcing efficiency analysis has been undertaken. Whenever equipment acquisition is planned, the volume of works in which it is to be utilised makes it cheaper to acquire the equipment than to lease it throughout the project.

An in-depth economic analysis (Annex 3) has been conducted on the intervention strategy and expected outputs and outcomes of the project. The project provides a feasible solution at scale for the most vulnerable of these households to face those threats, providing at the same time a replicable intervention strategy that can be applied to the whole *dryland* areas of the country if successfully implemented hereby. The main conclusion of the economic analysis is that, at a mean cost of 872 USD/beneficiary, the project is cost-efficient and provides improvements to the vulnerable condition of its beneficiaries, such as new incomes and better environmental and social conditions, as indicated before in Part II letter B.

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub- national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

The proposed Project is consistent with the “National Climate Change Action Plan 2008-2012” which demands actions for three strategic axes: (i) mitigation of greenhouse gases, (ii) adaptation to climate change and (iii) capacity building in adaptation and mitigation and with the National Adaptation Plan to Climate Change (NAP), approved in 2014. To establish criteria and lines of action for the implementation of the sectorial plans is among the NAP objectives. The NAP also establishes the development of pilot projects to initiate the process of implementation of the sectorial plans with concrete actions and mentions the “National Climate Change Adaptation Plan for Agriculture and Forestry”[5] as the

[5] The Plan can be downloaded from: mma.gob.cl/1304/articles-55879_InstrumentoFinalCC_Silvoagropecuario.pdf

specific set of measures for that sector. The proposed project is especially consistent with this Plan, published in 2013 by the Chilean Government (Ministry of Environment and Ministry of Agriculture) which includes 21 adaptation measures.

The two components of the proposed project are directly linked to the adaptation measures proposed in this national plan and can be therefore considered as pilot projects and "first step actions" for the gradual implementation of this plan on the country level. On this account, the experiences and lessons learned through the proposed project will be extremely helpful for the stepwise implementation of the national adaptation plan. The proposed project is aligned with 5 of the 21 adaptation measures of the "National Climate Change Adaptation Plan for Agriculture and Forestry":
Measure number 4: To optimize the National System for Agro-climatological Risk Management, which includes strengthen of the current National Agro-Climatic Network and capacity building activities;
Measure number 11: To develop a program of genetic improvement for vulnerable crops, this includes activities of dissemination and technology transfer for management of new varieties;
Measure number 13: To strengthen the actual mechanisms of the MINAGRI's Incentive System for the Recovery of Degraded Soils (SIRDS), which aims to reach most vulnerable communities;
Measure number 18: Implementation of rain harvesting systems in 8000 farms, which considers the small and most vulnerable farmers as the target beneficiaries; and Measure number 21: Development of guidelines to be included in capacity building for climate change activities, which consist in promote and enhance capacities among professionals of public sector and farmers to face proficiently the adaptation process to the new climate reality.
All these measures aims to the accomplishment of the Plan objectives: enhance the competitiveness of the sector; promote economic, social and environmental sustainability and strengthen the openness and market access.

E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

The execution of this proposal counts on an active participation of government institutions (Ministry of Agriculture and Ministry of Environment) and full compliance with the existing legal framework and procedures, which includes direct and outsourced operations, via tender.

Actions and tasks considered in the implementation of small and medium-scale investments have technical standards, accredited by the National Institute of Standardization (INN), which are not legally binding in a direct way, but are considered as prerequisites in the terms of reference and/or in the accreditation of consultants and technical services certified for the execution of works financed with State resources. In this case, the only pertinent standards are those related to water quality for irrigation and human consumption (NCh 1333, NCh 409). To comply with the standards each rain harvesting system includes the installation of water treatment equipment, water purifier

and filter.

Considering the current legislation in Chile (Law 19300 modified by Law 20417 that established the basis for environmental issues) and also considering the scale of the project and the nature of the activities involved in the proposal, this project does not have to present neither an evaluation nor a declaration of environmental impact.

In order to streamline the project implementation, the detailed-design phase has developed technical solutions for every output that ensure no authorisations such as municipal building authorisations are required. The only procedures upon which the project depends are therefore its own coordination, procurement and hiring processes, which are both incorporated in the intervention design and adequately habilitated in terms of time and dedicated staff (see Part III).

The proposal is categorised within Category C, considering there are not adverse environmental or social impacts. The project complies with the environmental and social principles as outlined in the Environmental and Social Policy of the Adaptation Fund.

F. Describe if there is duplication of project / programme with other funding sources, if any.

There are no other funding sources that would duplicate the measures proposed to be undertaken by this project.

Considering the components of the proposed project, the rain harvesting systems installation is the one activity that has been previously taken place in the project area, but on a small scale. There has not been any similar initiative in the region that contemplates the same goals and spatial and temporal coverage than the proposed project. In 2012, a project was developed in the region, in which 40 producers were benefited with rain harvesting systems installations. In 2013, a number of 160 units were installed, by another initiative. Although both projects show that this infrastructure achieves its objective - collecting a good amount of water, considering the climate conditions of the area - there were no further ‘capacity building’ activities and no continuity on the process of knowing ‘how to’ use these resources on agricultural production. Furthermore, there were no activities of holistic management - soil, water and species- associated to these projects or training on how to take the best advantages of the resources.

Previous smaller-scale rain water harvesting experiences have showed that using the roofs of houses and other water collecting structures, a total amount of 20000-40000 rainwater can be accumulated during an agricultural season.

This amount enables farmers to have sufficient water for hydroponic vegetable and forage production in small greenhouses. To store the harvested rainwater in 5400 liters ponds is a new experience for the small farmers in the project region.

The ponds begin to fill with the first rain of the year and its water can be successively used for greenhouse production, poultry breeding and egg production and, at the beginning of the dry season, even for human consumption.

For instance farmers using the rain harvesting system can produce 160 lettuces each time (480 during the season) This production can be sold up to USD 0.7 /unit. Chard cropping presents similar results of production. Cauliflowers can be cropped once per season. All these results have been check by INIA.

It is expected that the rainwater collection system will allow the farmers to generate an additional income during the growing season, and that this amount is mainly administrated by women who are in charge of greenhouse and poultry production.

The proposed project benefits a wholly new group of 558 small-farmers from the 8 municipalities in the project area. Farmers that were already benefited by the two initiatives previously mentioned are not considered among these 558. Despite that, those farmers will certainly have the possibility to take advantages of the capacity building activities and all the other activities of the proposed components, and will be able to improve the utilisation of the rain harvesting systems they already have and to develop a sustainable management of the resources on their farms. Permanent capacity building activities are carried out for producers and technicians, and also for students of rural schools of the area.

As already mentioned in Part II.A, the proposed project is consistent with three existing MINAGRI programs in the O'Higgins region: PRODESAL (local rural development program), SAT (technical assistance service) and SIRSD (Incentive system for sustainable agricultural soil management).

Both PRODESAL and SAT are productivity-oriented technical assistance programmes, which therefore cannot provide the needed adaptation support. Nonetheless, the project provides training-of-trainers to professionals involved in these programmes, so as to ensure that resilience and sustainability are incorporated into the technical assistance the programmes provide. These professionals participate in the project cost-free.

In the case of SIRSD, which is a soil conservation incentive programme, the project also provides training to professionals involved in programme management, in order to ensure that resilience building is considered. It is expected that the project will allow its beneficiaries to access machinery and knowledge that will qualify them for SIRSD co-financing, which otherwise does not occur because of minimum-capacity requirements in the programme (farm area, working capital, market orientation and so on). The project will thus enhance the sustainability of its provided support.

Due to its importance for the project outcomes, coordination with PRODESAL and SAT has been established at the nearest possible level (see Part III) through the participation of the local heads of the programmes in the eight Local Committees.

In the case of SIRSD, where coordination is needed at a higher, though still local level, coordination has been established through the participation of SIRSD Regional Committee members in the project's Executive Committee. Both Committees are chaired by the SEREMI of Agriculture for the O'Higgins region.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

The agro-technology transfer model consists in a combination of a “learning by doing” and a “learning by seeing” methods. In this context, farmers, local MINAGRI experts and local advisory teams work together to understand and to implement land use and farm management practices which are appropriated to climate change and climate variability and which, in general, improve and secure agricultural productivity and water resources management.

The “learning by seeing” component refers to the guided visits to the demonstration fields of farmers from the Project area and from outside the project area, totalling more than three thousand farmers. This combined learning and knowledge sharing approach will be enriched by learning from best practice experiences from leading agricultural institutions of countries with similar conditions to the *dryland*, through a number of activities (training of professionals, farmer technical visits and others). Best practice identified for example: Argentina (climate change adaptation), Brazil (farm management in dry ecosistems), Spain (efficient water management), México (rain water collection and management) and Australia (risk communication).

The project implements a monitoring system to evaluate the results of the agro-technology transfer activities and the effectiveness of the agro-climatic information dissemination in the wider context of climate change adaptation and resilience building. This monitoring and evaluation system allows an estimation of the degree of achievement of the projects objectives and, if necessary, the application of corrective measures during project implementation.

Considering the importance of the zero tillage activities and their successfulness, those will be thoroughly monitored along with all other activities in demonstration units, and the learning from it incorporated in the training to be provided to farmers.
Special references to zero tillage activities and its results will be done in the context of dissemination activities intended for neighbour municipalities, regions and other countries.
The successful incorporation of these practices by the beneficiaries will be monitor through 2 indicators (See Part III, section E):

Number of hectares with improved soil quality: End-of-project target= 5000 hectares
Household income increased: End-of-project target= USD 1000/year

No specific component of the project deals with learning and knowledge management, but a “Capacity development and knowledge management plan” has been included (see Annex 2)

The project provides state-of-the-art knowledge, a comprehensive training and dissemination strategy and the material conditions for the acquired knowledge to be applied at scale. Further, specific knowledge management tools intended for targets

within and beyond direct and indirect beneficiaries are planned and resourced, such as:

- a project website that provides outreach and feedback capabilities for all applied techniques and methodologies;
- professional services for communication activity and commensurate budget for social media, local radio and other channels;
- targeted replication and diffusion activity;
- the publication of a manual of best practice.

A constant flow of data and information provides detailed information on the demonstration units' performance –evolution of the properties of the soil; results of each applied technique; response to plagues and diseases; and water stress and irrigation needs- and the physical and agronomic monitoring of demonstration units is added to the monitoring of social and economic indicators- on 558 beneficiaries of water-harvesting facilities, through yearly surveys; on whole vulnerable population in the project municipalities ; and learning and appropriation monitoring done on all training participants.

Adaptive management

This set of indicators (physical, agronomic, social, and economic indicators) is analysed and put at the disposal of Local Committees along with its analysis on a yearly basis, in order to inform decisions on crops and techniques for the following and subsequent years. This information also informs project's communication.

A complete set of direct-training and training-of-trainers activities is included in the project intended to improve the capacities of direct beneficiaries and the teams that provide them with technical assistance, including project staff, on a constant basis.

This programme, organises and develops training and dissemination activities along the year and both for local farmers and others coming from neighbour municipalities and regions, provides opportunities for the farmers to constantly visit the demonstration units and knowing first-hand about the demonstrations being developed therein.

Training events approximately develop in the numbers shown below providing opportunities for farmers, professionals and visiting peers to exchange knowledge and news:

Year	1	2	3	4
Number of training and dissemination events	7	30	38	34

Communication

A specialist in rural communication is retained by the project (see detailed budget Part III –G, National consultants) and is part of the project management unit, in order to define, coordinate and carry out a coherent communication and diffusion strategy that includes news on training and demonstration opportunities, learnt lessons when provided by

project activities and information from the agro-climatic risk management system (drought alerts, frost alerts, hydric stress alerts. Result 2.1).

The communication strategy of the project is also provided with a project webpage, a consultancy on defining appropriate communication strategies, information dissemination and training for the agro-climatic risk management system (Result 2.1), Professional communication services in order to adequately format messages to audiences, and budget for radio advertising services, found in the consultation to be the most utilised media among target population.

Dissemination and lessons learned

At least 36 field days are organised in the demonstration units. These are open house days where both local and visiting farmers are provided with opportunities to see and ask about all demonstration activities in these fields, as well as receive problem-solving advice on adopted practices. At least 4 days per demonstration field are envisaged during years 2, 3 and 4, with a planned participation of 3096 persons in total. Far greater local attendance can be expected. Outreach activities in rural schools are also planned, at least 1 per year for each demonstration unit to visit local rural schools.

The project also plans for dissemination activities for the professional audience. Local professionals in charge of SIRSD and neighbour-region professionals and technicians are considered for training in soil and water conservation techniques and Interpreting agro climatic indicators for decision-making.

As already mentioned, in the third year of the project a manual of best practices and lessons learned on soil and water management for the *secano* (non-irrigated areas) is to be compiled and distributed, thus codifying the experiences of the project and allowing for them to be replicated in any other similar area in the country and in other countries.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

The actions of the proposed project are strongly linked to the adaptation measures of the first draft version of the "National Climate Change Adaptation Plan for Forestry and Agriculture" which has been identified in 2010 through a participatory process (farmers and MINAGRI experts, see table 1) on country level, including the region of O'Higgins, where the Project area is located. Furthermore, for the elaboration of the final version of this national plan, the proposed adaptation measures has been presented and discussed during 2012 in eight workshops in different Chilean regions, including the region of O'Higgins. This process of public consultation ("Consulta Pública") has been carried out with a broad stakeholder participation including farmer communities, agribusiness representatives, public sector officials and academics. One of the main goals of this process was the identification of pilot projects as a first step towards the implementation of the national plan on a local scale and oriented to the needs of climate change adaptation at the local level with special regard to small farmers. The proposed Project therefore is the direct results of this stakeholder driven pilot project identification process.

Figure 8: top to bottom, consultation workshops held in Litueche, Marchigüe and Pichilemu

Of special importance in this context of stakeholder consulted project identification is the Institute for Agriculture Development (INDAP) of the O'Higgins region. This institution, which belongs to the Ministry of Agriculture, is focused on the development of small farming activities and responsible for strengthening the human and economic capacity of this sector with the aim of sustainable poverty reduction and increased competitiveness. The inclusion of this institution from the beginning of the project formulation process guarantee that the projects components and the proposed methodology meet the needs and special conditions of the small farmers in the Project area (both man and women) and their families.

During the months of April to June 2015, a project-specific consultation process was carried out on the project's objectives and expected results. This process included in-depth interviews to long-time practitioners in the area (mostly INDAP professionals, table 13), three workshops in the project area which were attended by more than 150 persons (table 14 and figure 8) and individualised assistance to the filling of a multi-objective format which provides detailed information on the project's target population, and that became an

individual interview that provides very relevant profiling information. This last activity ended up with the collection of 558 selected-beneficiary files.
A detailed report of the Participatory process and a complete list of all the stakeholders consulted have been included in Annex 1.

Municipality	Interviewed person
Litueche	Mr. Daniel Bascuñán
Marchigue	Mr. Gustavo Jorquera
Pichilemu	Mr. Rodrigo Clavijo
Paredones	Mr. Sebastián González
Pumanque	Mr. Rodrigo Valenzuela
Navidad	Mr. Juan Francisco Rubio

Table 13: Key informants interviewed

Municipality	Date	Place	Meeting size
Litueche	28 May 2015	Litueche Church Hall	50 persons
Marchigue	27 May 2015	Rafael Casanova Community Centre	50 persons
Pichilemu	27 May 2015	PRODESAL Centre	70 persons

Tabla 14: Participative workshops

The participatory process considered information from INDAP, PRODESAL and Municipalities. These institutions have reliable data about the farmers of the project area. The 558 pre-selected beneficiaries are the most vulnerable farmers in their respective municipalities, some of them take part of current MINAGRI programs, but a majority of them are not even eligible for MINAGRI support to poor farmers. The process was explicitly designed to allow for and encourage their participation.

Positive discrimination was applied to the process with regard to gender. 57% of the 558 pre-selected beneficiaries are women, far above the mean women-participation rate in agriculture, rural population, poor farmers or any other applicable category.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Climate change and climate variability impacts in agriculture and livestock systems have a high economic, social, and environmental cost in dry-land areas of the O'Higgins Region of Chile, especially due to water scarcity and draught. Current efforts to overcome this

situation and mitigate the magnitude of these impacts have been limited to reactive responses. Regarding the events of draught, these reactive responses seek to solve the most urgent problems by providing water for human consumption through “water tankers” but without satisfying the demand for agriculture activities.

However no medium term preventive actions have been put in place to manage the effects of water shortage, considering the current situation and the climate future projections. Therefore the communities in the project area are highly vulnerable to water shortage that threatens human consumption and agriculture. It is urgent to implement a mid and long term strategy to improve the adaptive capacity of the rural population in these areas.

The Chilean Government recognizes the urgent need of adapting to climate change within the context of sustainable development and has elaborated the “National Climate Change Adaptation Plan for Agriculture and Forestry “,Its implementation however is aggravated by budget limitations. There is therefore a keen need for external support to enable the implementation of pilot projects in the project area to afford medium and long term preventive actions related to water supply for human consumption crop and livestock management. These pilot protects, which are understood as a first step towards the implementation of the national adaptation plan, additionally will contribute to strengthen the capacities and expertise of the Ministry of Agriculture and its local institutions to create examples of best practise and to promote its application on a national level.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

The two components of the proposed project have been designed considering that their implementation permits the sustainability of the results over time.

It is assumed that this sustainability will be ensured by the combined effort of the local beneficiaries of the project with support from the local MINAGRI institutions. Sustainability in this context refers to: (i) the continuity and steadiness of the applied new practices in farm management and agro-climatic information management and (ii) the maintenance of the infrastructure facilities and agricultural equipment provided by the project

At the end of Project, local advisory teams will be part of the Technical Assistance Programs of INDAP, SAG and INIA and will, among others, disseminate and apply the technology transfer experiences gained during the projects execution period.

The special agro-climatic information system developed by the project will be integrated in the existing information technology facilities and additionally supported by the National Unit for Agro Emergencies and Agro-climatic Risk Management (UNEA) of the MINAGRI.

Local Committees guarantee the continuous access of farmers to the local agromachinery pools instated during the project. The first year of the proposed project will be focused on the delivery of outputs 1.1.1, 1.1.2, 1.1.3 and 2.1.1. Scaled incorporation of small farmers to the activities has been estimated as follows:

Year	% of total small-farmers benefited*
1st	10%
2nd	30%
3rd	40%
4th	20%

*The target group are 2,200 small farmers. The table shows the percentage of these farmers that participate each year in activities conducive to outputs 1.1.4, 1.1.5, 1.1.6, 1.2.7 and 1.2.8

The installation of rain harvesting systems, output 1.2.7, is completed in the year 4, with 558 units installed, while 2,200 farmers are provided training, technical support and access to machinery pools.

These activities will also benefit the small farmers families and will consider the integration of rural and farming scholars of the project area so as they would be benefit by the capacity building activities too. Considering the characteristics of the rural communities, more than 10,000 people will be directly or indirectly benefited from the project components.

On the other hand, around 12,600 small-farmers are located in the O'Higgins region and nearby regions of Coquimbo, Valparaíso and Maule. It is expected that more than 3,000 among these benefit from exchange and demonstration activities of the project.

INIA and INDAP technology transfer programs secure the diffusion and capacity building activities and will allow expanding the number of farmers benefited. Also, SAG through its support programmes contributes to the dissemination of adaptation practices linked to the demonstration units. The agro-technology transfer and capacity building activities are going to be incorporated inside the "Plan of Work" carried out by the following three programmes already in execution under the Ministry of Agriculture: PRODESAL, SAT and SIRSD. The project activities develop synergies with these programmes.

The objective of the PRODESAL programme is to support rural families in order to enhance their agricultural and forestry activities, through technical advice and investment funds, so as they increase their incomes and improve their quality of life. This programme is implemented with the assistance of Municipalities.

The objective of the SAT programme is to improve business and productive system competitiveness, under a sustainable framework, building capacity through agro-technology transfer, advising about management and articulating the efforts with other support programmes.

PRODESAL and SAT teams will include constant visits to the demonstration units, among the activities in their agendas.

In the case of the SIRSD programme (Incentive System for Agro-environmental

Sustainability of Agricultural Soils), carried out by SAG and INDAP, the main objective is to recover productive potential of degraded soils and keep those improvements. The smallholders would be able to receive economical resources to implement soil conservation practices to increase their adaptation capacity to climate change.

All these programmes and resources that already exist will be focused on small-farmers' needs during and after the proposed project, under the framework of adaptation to climate change. As mentioned in Part II.A., a cooperation agreement between the project and these programs will be signed which will contribute, among others, to the continuous maintenance of project infrastructure and equipment.
The Unit of Agricultural Emergencies and Climate Risk Management (UNEA) under the Ministry of Agriculture will allow promoting the demonstration units and the adaptation measures implemented. UNEA has a special component for Capacity Building and Dissemination and works coordinately with the regional teams of the Ministry of Agriculture, through Regional Commissions for Agricultural Emergencies (CREA). These commissions have permanent participation of the regional services under the Ministry. Furthermore, UNEA permanently works in collaboration with private institutions to enhance the capacities of small-farmers, especially the most vulnerable, in order to face variability and climate change. Among other actions, some activities previously made are: local workshops, field days, distribution of technical materials such as manuals with agro-climatic information and adaptation practices for extreme events (water scarcity and drought)

On the other hand, the Ministry of Agriculture has a regional budget that will be focused on activities that will ensure the sustainability of the proposed project. Some economic instruments managed by the Ministry, will be redirected to support other communities not included in the proposed project in order to develop new projects and activities to replicate the results of the current components. Agreements with local and regional governments are going to be signed in order to address the same goals.

It can be furthermore assumed, that the capacities, skills and knowledge obtained through the activities described in the project components, will be kept by the local communities and strengthened over time through the ongoing operation of these fields.

In the case of the machinery, there will be a formal agreement between Ministry of Agriculture, Municipalities and farmer associations for the responsibility during the project and after it.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		✓
Access and Equity	✓	
Marginalized and Vulnerable Groups	✓	
Human Rights	✓	
Gender Equity and Women's Empowerment	✓	
Core Labour Rights	✓	
Indigenous Peoples	✓	
Involuntary Resettlement	✓	
Protection of Natural Habitats	✓	
Conservation of Biological Diversity		✓
Climate Change	✓	
Pollution Prevention and Resource Efficiency	✓	
Public Health	✓	
Physical and Cultural Heritage	✓	
Lands and Soil Conservation	✓	

The project incurs no (negative) impacts or major risks within the categories in the ESR. It fully complies with all applicable Chilean laws and regulations, focuses on marginalised groups who participate on a voluntary basis, positively discriminates in favour of women, incurs no infringement on labour rights, plans no resettlement whatsoever, affects no indigenous peoples or natural habitats, produces no significant pollution and contributes to the efficient use of water and energy resources, and produces no negative impact on biodiversity, public health or heritage. The project relates to climate change, but not in the sense of generating it, and is expected to (positively) impact land and soil conservation. All risks identified in the PRF have been rated low or very low during the project design phase. Annex 4 includes ESMP.

The project is to be executed by Government institutions and in full compliance with all applicable Chilean laws and regulations.

All project beneficiaries participate in the project voluntarily. Their human and labour rights are carefully respected. The project does not count on any labour contribution from its beneficiaries for the installation of equipment, which is donated to them free of charge. Demonstration units are also agreed with small/medium landowners who volunteer for it. A contract will be signed between each landowner and the official representative of the project, on their land being used for demonstration purposes. This covenant will explicitly indicate obligations and compromises between parts and the mechanism for conflict resolution.

Project beneficiaries, who have been pre-selected during the consultation process, were called among those farmers who are not even eligible for conventional support by the Ministry of Agriculture because of their vulnerability (landholding does not meet the "minimum agronomic unit" size, they do not have machinery with which to undertake promoted works, they do not know the programmes, they are not capable of filling forms or requests, or are otherwise excluded), and they filled and signed forms and participated in meetings in a voluntary manner. Potential project beneficiaries are 57% women, reflecting positive discrimination towards them in the call for project beneficiaries.

There is no health considerations related to rainwater in the project area. Nonetheless, water filters and purifiers have been included in the kit

A grievance mechanism is available for stakeholders, as follows:

The beneficiaries can complain about flawed implements or materials installed or the noncompliance of the programmed activities.

Special forms will be available in the 9 demonstration fields, in the 8 Municipalities of the Project area and in the Regional Ministerial Secretary of MINAGRI. The official who receives the complaint will register it and deliver the form to the technician in charge of the corresponding demonstration field (located in the commune where the beneficiary lives).

The technician in charge will have 20 labour days to respond with a solution to the problem. If the complaint requires further analysis, it will be delivered to the INIA Chief Technical Advisor of the Project (see Part III letter A), who will resolve.
Technicians in charge of the 9 demonstration fields will send a list of grievances and their solutions to the PMU, to include this data in the quarterly status reports, QSRs (see Part III letter D).

Notwithstanding the foregoing, Chilean Government, within the framework of the Transparency and Access to Public Information Law, counts with the OIRS's: "Information, Suggestion and Grievance Offices", which are available in all the Governmental Institutions, including MINAGRI and MMA, established for citizens to inform, suggest, ask for information and complain.

The proposal is categorised within Category C, considering there are not adverse environmental or social impacts. As it was described previously in Part II, letter B, the project has many benefits both social and environmental and meets the national standards as it was mentioned in letter e above.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The Government of Chile (GoCh) will implement the project through National Implementation Agency (NIE) the Chilean International Cooperation Agency (AGCI). Executing entities for the project are the Ministry of the Environment through its Secretariat for the Environment, and the Ministry of Agriculture (MINAGRI) through its Secretariat for Agriculture, its Regional Ministerial Secretariat for O'Higgins (SEREMI VI) and those agencies reporting to the Agricultural Policies and Studies Office (ODEPA), the Agriculture Research Institute (INIA), the Institute for Agricultural Development (INDAP) - in particular through its Local Development Programme (PRODESAL), carried out in coordination with the municipalities, the Agricultural and Livestock Service (SAG), the Technical Advisory Service (SAT) and the National Unit for Agricultural Emergencies and Agroclimatic Risk Management (UNEA).

The Chilean International Cooperation Agency (AGCI) is the National Implementing Entity (NIE) for the Project, to be implemented in collaboration with the Chilean Ministry of the Environment and the Ministry of Agriculture.

AGCI as the NIE is responsible for the general management of the Project. This includes the financial administration of the Project as well as follow up and presentation of reports before the Adaptation Fund.

To fulfill the Agency´s obligations as the NIE, a highly specialized team will be established to carry out the following financial and technical management duties and responsibilities of the Project:

Manage two currency accounts for the Project, one will be in U.S. Dollars and the other in Chilean Pesos.

Prepare and submit requests for withdrawal of Grant funds before the Adaptation Fund.

Prepare and sign a Subsidiary Agreement with the Ministry of Agriculture for the implementation of the Project. This Agreement will establish the following: the obligations and responsibilities of the Ministry, the amount in US Dollars that AGCI will transfer to the Ministry for Project implementation, the norms and standards that will regulate the procurement plan, the rendering of accounts that the Ministry shall present to AGCI.

Manage the financial administration of the Project utilizing the national financial and accounting system in both currencies (U.S. Dollars and Chilean Pesos), according to international accounting standards.

Review and register the accounts rendered by the Ministry of Agriculture to AGCI. During this revision, AGCI will verify and confirm the implementation of the procurement plan, that expenses are in accordance with the Project´s implementation and that they are supported by necessary documentation.

Project monitoring and evaluation according to the indicators established under the Project´s logical framework approach and Gantt chart.

Present to the Adaptation Fund all financial and technical management reports.

Contract the financial auditing services for the Project.

Carry out the Project in accordance with the guidelines and regulations of the Adaptation Fund.

Other entities that may participate in governance structures and project management, in the framework of their existence, powers and functions as recognized by Chile's legal system, are the National Forestry Corporation (CONAF), the National Irrigation Commission, the Ministry of Public Works' Directorate General of Water, the Regional Government of the Region of O'Higgins (GORE VI), and the Municipalities of Paredones, Pichilemu, Marchihue, La Estrella, Litueche, Navidad, Lolol and Pumanque, particularly in relation to INDAP's Local Development Programme.

MINAGRI and MMA will sign the agreement with AGCI for executing and managing the project as a whole. The responsibility for project execution on the ground rests with MINAGRI, who will appoint the Regional Ministerial Secretary of Agriculture for the Region of O'Higgins as National Project Director.

INIA will appoint a Chief Technical Advisor for the Project who will advise the National Director on all technical and capacity-building aspects of the project. INIA will also assume institutional responsibility for these technical and capacity-building aspects and will have a central role in the support and training of field personnel from the institutions and project beneficiaries.

UNEA is the main executor of Component 2 of the project, which will increase the capacity for the production of agro-meteorological knowledge applicable in particular to the management of agro-meteorological hazards (drought, frost risk) and the improvement in efficiency regarding soil and water resource use. This knowledge and its applicability will feed the project's training plan, allowing access by experts and beneficiaries to data and contextualised analysis through familiar means and at appropriate times.

INDAP has a significant deployment of technical assistance in the project area, in particular the presence of PRODESAL technicians who are the primary source of technical assistance for the project's farmer beneficiaries, as well as the Technical Assistance Service (SAT). As such, INDAP staff will be involved with all the project's decision-making bodies (see below), including the local committees which constitute their most important presence in the field.

AGCI, MINAGRI and MMA will collaborate with those other programmes and projects in order to identify opportunities and facilitate mechanisms to achieve synergies. This collaboration will be made through informal communications between programme and project managers and technicians and exchanges of information and other material.

In order to ensure that the opportunities for coordination and collaboration between different initiatives materialise, we have included specific coordination functions in the scope of work of the Steering Committee (see below).

MINAGRI - through the National Project Director and the Project Management Unit (PMU), set up for this purpose, and the UNEA, SAG and INDAP executors (see below) – will be the institution responsible for project execution in the field, particularly: (i) the technical execution of project activities; (ii) monitoring project progress and achievement of results; and (iii) financial planning and planning for the procurement of goods, minor works and services, which will be supervised by the PMU. The PMU will prepare for the National Director, who shall send them to the Steering Committee, quarterly project status reports (QSRs), detailed annual operational plans and budgets (AOPs), and Financial Management Reports (FMRs) (see below).

The project has the following management and coordination bodies: Steering Committee, Executive Committee and Local Technical Committees (see formation and functions below).

The Steering Committee is a collegial body that oversees and supports the smooth running of the project from the national level. It is composed of the Ministers of Agriculture and the Environment and the Executive Director of the Agency for International Cooperation. The Committee receives reports from the Project Manager, ensures project coordination and synergies with other instruments and programmes and recommends measures. Its functions are a) to review and approve AOPs and annual management, budget and financial reports for the project b) provide general strategic and execution guidance to the National Project Director. The Committee meets once a year as a general rule and there are no quorum requirements.

The Steering Committee uses the Advisory Committee for identifying opportunities, giving expert advice and the application of their decisions. The Advisory Committee is made up of representatives from the MMA and MINAGRI (national level). Other participants (such as CONAF, CNR, DGA, DMC or the Regional Government of O'Higgins, GORE VI) may be invited to Steering Committee meetings, as deemed necessary.

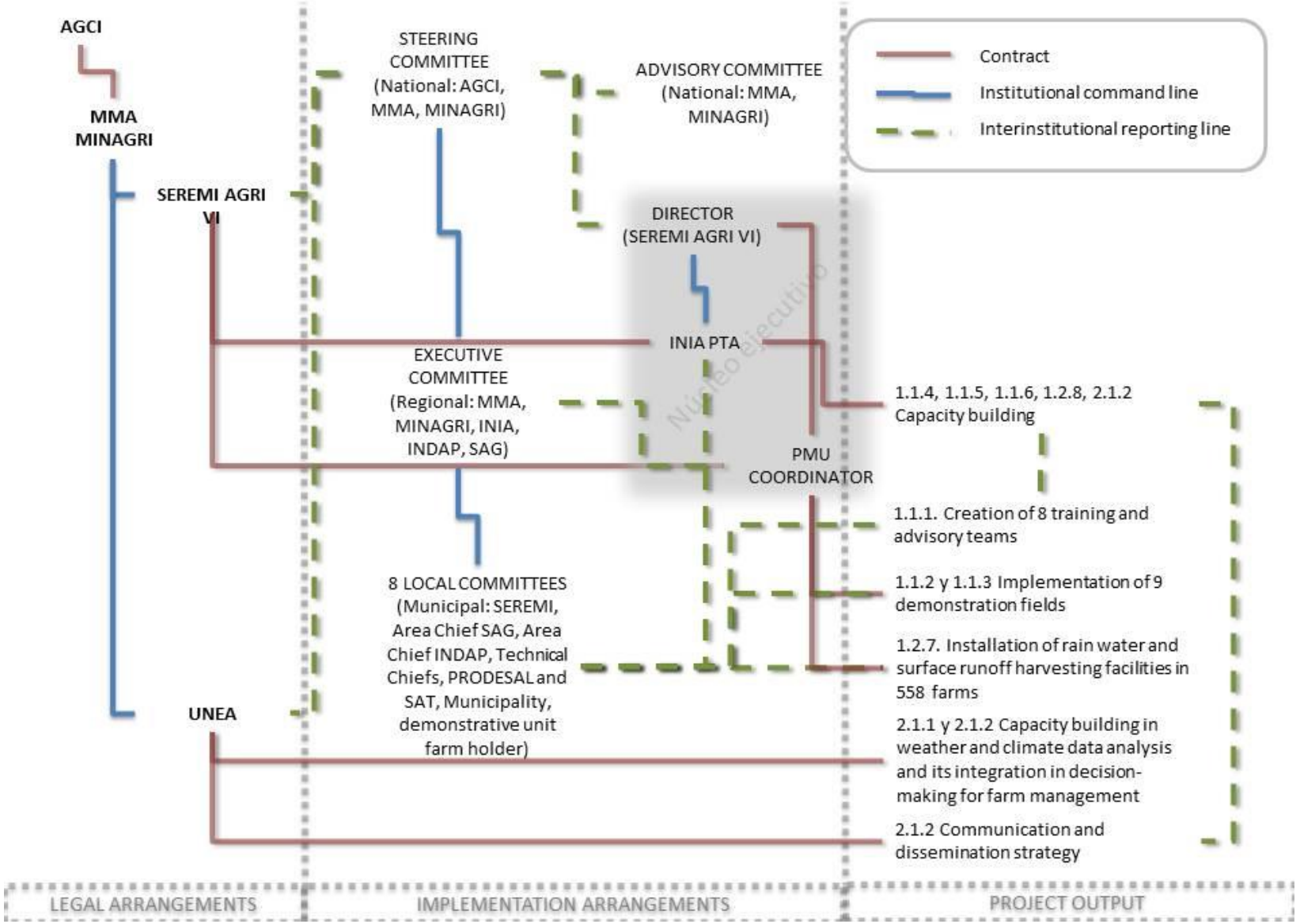
The Executive Committee is the official body in charge of specific project coordination and supporting and advising the National Director on technical and operational aspects and matters concerning inter-regional coordination. It is made up of the National Project Director (who calls and presides over meetings) and the highest regional authorities from MMA, INIA, INDAP and SAG. The Committee shall meet at least once a quarter. Its procedures and mechanisms will be established at its first meeting. If deemed appropriate the National Director will invite to meetings experts in the matters to be discussed. They will report to the Committee.

Finally, eight local project committees will be established, operating at municipal level in the municipalities of Paredones, Pichilemu, Marchihue, La Estrella, Litueche, Navidad, Lolol and Pumanque. Each of these committees shall comprise the SEREMI or its

delegate, the SAG Area Manager, the INDAP Area Manager, the Technical Managers of the SAT and of the PRODESAL for each municipality, and a representative of the corresponding demonstration plot. These committees will coordinate training activities in the municipality (both those intended for farmers and those for technical staff from their institutions) and they will supervise the use of the machinery from the demonstration unit. In the case of the ninth demonstration unit, located in the Hidango INIA facilities, this will be supervised by the Executive Committee.

The relationship between the project bodies is as follows:

IMPLEMENTATION ARRANGEMENTS



The main responsibilities for activities are shown in the table below:

Component/ Output	Institution responsible
Component 1.- Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock.	
Result 1.1.- Implementation of a capacity building and training systems to increment the resilience capacity of farm communities vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management.	
Output 1.1.1.- Creation of training and advisory teams for agro-technology transfer for each one of the 8 municipalities of the project area, coordinated and supervised by local INIA experts.	INIA, SAG, INDAP, Municipalities
Output 1.1.2.- Implementation of 9 demonstration fields for agro-technology transfer (1.1.4, 1.1.5, 1.1.6 and 1.2.8) including its infrastructure and equipment (fencing, water troughs, electrical power supply, etc.): 4-5 hectares in each of the 8 municipalities plus one on INIA ground.	INIA, UNEA, Local Committees
Output 1.1.3.- Acquisition (including maintenance and operating costs) of agricultural machinery for the 9 demonstration fields.	PMU
Output.1.4.- Training in sustainable soil management: plowing practices, fertilizing practices, soil fertility recovering practices, holistic soil management.	INIA, Local Committees
Output 1.1.5.- Training in the use of crops (wheat), forage crops (legumes, graminoids), fruit trees (olives, nuts)) and livestock (sheep), tolerant to climate variability and climate change, including the acquisition of seeds, plants and animals.	INIA, Local Committees
Output 1.1.6.- Training in efficient water management on the demonstration fields (including the acquisition of the equipment) through the application of irrigation technology powered by renewable energy resources (sun, wind)	INIA, Local Committees
Result 1.2. Implementing measures and technologies to increase availability of water resources for the rural communities of the coastal *dryland* and interior of the O'Higgins Region	
Output 1.2.7.- Installation of rain water and surface runoff harvesting facilities in 558 farms including training and acquisition of materials and equipment (roof materials, rain pipes, mobile water cisterns, pumps powered by renewable energy resources (sun, wind), greenhouse installation).	PMU
Output 1.2.8.- Capacity building through knowledge sharing and good practice demonstrations	INIA, Local Committees
Component 2.-Installation of an information system for agro-climatic risk management and climate change adaptation **Result 2.1.- Improve the decision supporting agroclimatic information management for actual climate and future climate changes for local MINAGRI professionals and farmer communities**	
Output 2.1.1.- Strengthening of the existing network of automatic meteorological stations (AMS) in the project area.	UNEA

Component/ Output	Institution responsible
Output 2.1.2.- Capacity building in weather and climate data analysis and its integration in meaningful decision- making for farm management.	UNEA, INIA

MINAGRI and MMA, at the proposal of MINAGRI, will appoint the SEREMI of Agriculture in the O'Higgins region as National Project Director. This professional will monitor activities, ensure timely delivery of government contributions and will be fully responsible to the Government for products and results. The National Director will not be paid with project funds.

Daily management of administrative matters, monitoring and accounting will be done by the Project Management Unit (PMU). This will be made up of a Coordinator, who directs, an Accounting/Administrative Assistant, and a Coordinating and Monitoring Assistant (all three paid with project funds)

The PMU will be responsible for operational coordination, preparation of AOPs and financial reports, monitoring and support for project evaluation. It will be supervised by the National Directorate and responsible for the daily management of the project, in particular: (i) operational and logistic coordination of project activities; (ii) the daily monitoring of project progress and achievement of results, and (iii) financial planning and planning of procurement of goods, minor works and services, which will be conducted through the public procurement system. The PMU will prepare and submit to the Project's National Directorate quarterly project status reports (PSRs), operating plans and detailed annual budgets (AOPs) and Annual Management Reports. Additionally, the PMU will be responsible for coordinating all other aspects that contribute to the good progress of the project.

B. Describe the measures for financial and project / programme risk management.

Critical risks for the implementation of the project were analysed in the design phase with the participation of the principal stakeholders. The risk management mechanism of the project will be set out in detail below. The most important risks and measures to mitigate them are as follows:

Identifier	Type	Risk	Classiaction	Mitigating Measures
1	Climate	Climate change is greater than what was projected by the analysis and studies	Medium	The Mediterranean ecoregion is the most vulnerable region to climate change in Chile, according to the best and most recent information available. The actions contribute to the adaptation of the most vulnerable people by increasing their ability to maintain and improve their livelihoods in conditions significantly more adverse than at present (approximately + 25% T and -25% P in medium and unfavourable scenarios) using drought-resistant species/varieties, increasing the availability of water, improving soil management and other.
2	Operative	The beneficiaries resist changes in practices	Low	The systems for mitigating predicted risks (eg support in capacity building for beneficiaries, appropriate rates for the disbursement of grants, working in a flexible way that responds to the strengths and weaknesses of the beneficiaries, regular follow-up visits) support maintaining or improving capacities. The project also reduces risk, supporting the replication of best

				practices. The participatory process undertaken detected a high demand for the solutions proposed in the sample.
3	Political	The government or institutions does not attach enough priority to the programme.	Low	Institutions participating in the project are strongly committed to it, which represents an opportunity to trigger a process of adaptation at an appropriate scale in the Chilean *Dryland* beyond the project area. The Undersecretaries of Agriculture and Environment are the highest political authorities involved in the project and the highest ranking of all the executors.
4	Operative	Lack of incentives or financial capacity of beneficiaries to invest in restoration or improvement can lead to ineffective results in land use and other expected results.	Low	The project provides skills and investments to vulnerable populations from which the project design does not expect or presuppose investment capacity. At the same time, the project's Partners Committee has confirmed the participation of the most important organisations in the country in terms of land use and rural development, including CONAF and INDAP, who have agreed to coordinate their development tools for the purposes of achieving project results.

A fundamental component of the project's management activities includes a comprehensive risk management strategy. The Steering Committee will provide support to the project team and executors for the constant monitoring of risks, which will be monitored and reported in the project's annual reports.

Additionally, a budget specifically for the purposes of monitoring and evaluation has been assigned as part of the execution costs (see below).

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

The project reinforces the existing training and technical assistance structures and prepares them to accompany the adaptation process through technical support and training of professionals and technicians; it implements demonstration fields where technologies for soil management, crops, livestock and water are demonstrated in conditions that are real and similar to those of the beneficiary farmer conditions; it provides access to equipment and machinery needed for its implementation; and extends proven technologies for water harvesting and use on an adequate scale to ensure widespread, large-scale deployment. Component 2 locally strengthens the national agro-meteorological network in a way that allows for data and information to be collected and made available to technicians and farmers by familiar and often used means, in the form of applicable knowledge and the alerting to agro-meteorological risks.

Given the above, and the fact the project deals with issues that are not controversial areas in terms of the interests of the participants, the project has a category C, in accordance with the Adaptation Fund's Environmental and Social Policy document, and as such neither an environmental impact assessment is required, nor complementary analysis of environmental impact. The Environmental and Social Review Form is annexed.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

The monitoring and evaluation of progress in achieving project results will be based on targets

and indicators established in the Project Results Framework (see below). Monitoring and evaluation activities will follow the AGCI and Adaptation Fund's policies and guidelines for monitoring and evaluation. The monitoring and evaluation system will also facilitate learning and the replication and scaling of the results and lessons of the project.

The functions and responsibilities of monitoring and evaluation, specifically described in the Project Monitoring Plan (see below) will be fulfilled through:

the continuous monitoring and supervision missions of the project's progress (Advisory Committee, National Directorate and PMU);

the technical monitoring of progress in the installation and availability of equipment (PMU);

the monitoring of capacity building and knowledge management indicators (Advisory Committee, National Directorate and PMU); and intermediate and final evaluations (independent consultants and Advisory Committee).

For the execution of the project the PMU will establish a system for monitoring project progress. Participatory mechanisms will be put in place for the collection and recording of data to support the monitoring and evaluation of outcome and output indicators. During the project launch workshop (see below), the tasks of monitoring and evaluation will include: (i) presentation and explanation (if needed) of the project's Results Framework with all project stakeholders; (ii) review of monitoring and evaluation indicators and their baselines; (iii) preparation of draft clauses that will need to be included in consultants' contracts to ensure compliance with monitoring and evaluation reporting functions (if applicable); and (iv) clarification of the division of monitoring and evaluation tasks among the different stakeholders.

Continuous monitoring of the project will be the responsibility of the PMU and will be guided by the preparation and execution of an AOP, backed by QSRs. The AOPs will show project activities proposed for the following year and will offer necessary details on product goals and QSRs will include information on the monitoring of the execution of activities and the achievement of product goals. At least one annual meeting of the Steering Committee to review project progress and planning will be held in order to evaluate and approve the AMR from the previous period and the AOP of the next period. The AOP shall be drawn up in accordance with Results Framework in order to ensure proper compliance and the monitoring of project outputs and outcomes. On approval of the project, the AOP of the first year will be adjusted to synchronise it with an annual reporting calendar (January 1 – December 31). In the following year the AOPs will follow an annual scheme, in line with the reporting cycle described below.

The reports that are prepared specifically in the context of the monitoring and evaluation plan are: (i) the project launch report, (ii) the Annual Operating Plans and Budgets (AOPs), (iii) Quarterly Status Reports (QSRs), (iv) Annual Management Reports (AMRs), (v) technical reports and (vii) the Final Report.

Project launch report: after project approval by the Adaptation Fund and once the PMU is running, a launch workshop will be held. Immediately after the workshop, the PMU will prepare a project launch report in consultation with the Advisory Committee. The report will include a description of the functions and institutional responsibilities and coordination activities of the project actors, the progress made in establishing the project and start-up activities and an

update on any change in external conditions that could affect the project. It will also include a detailed AOP for the first period (to December 31 of the present year) and a detailed monitoring plan based on the monitoring and evaluation plan presented below, including indicators. A draft of the launch plan will be distributed by the Advisory Committee for review and comments before the plan is finalised within three months after the start of the project. The project will be approved by the Advisory Committee.

Annual Operating Plan and Budget (AOP): The PMU will submit to the Steering Committee a draft of the AOP before January 20 of each full year of project operation. The AOP should include detailed activities to be executed for each of the project's products in monthly periods, and the dates on which the goals and milestones of output indicators will be achieved over the year. Also included will be a detailed budget for project activities to be undertaken during the year, along with all the necessary monitoring and supervision activities. The Coordinator will circulate a draft of the AOP to the Advisory Committee and the Executive Committee for review. The final AOP will be presented by the National Director of the Steering Committee for approval.

Quarterly Status Reports (QSRs): The PMU will submit quarterly status reports to the National Directorate within 15 days from the end of each quarter. The QSRs will be used to identify constraints, problems or bottlenecks that impede the timely execution of project activities and to take appropriate corrective measures. They shall be drawn up based on the systematic monitoring of performance indicators and products identified in the project's Results Framework. The National Directorate will forward these reports to the members of the Advisory Committee and Executive Committee.

Annual Management Reports (AMRs): The project's National Directorate shall prepare, with the support of the PMU, an Annual Management Report covering the period of the last applicable AOP. This will compare the substantive results and financial performance for the period with the AOP and identify measures to correct and improve, which will be incorporated in the next AOP. The National Directorate will forward these reports to the members of the Advisory Committee and Executive Committee.

Technical reports: technical reports will be prepared as part of the project outputs as well as for documenting and disseminating lessons learned. Drafts of all technical reports should be submitted by the PMU to the National Directorate, which in turn be will presented by them to the Executive Committee for review and approval and to the Advisory for their information and possible comments, before they are finalised and published. Copies of finalised technical reports will be distributed to the Advisory Committee, the Executive Committee and other project stakeholders, as appropriate.

Final Report: within three months prior to the date of completion of the project, the National Director will present to the Executive Committee and Advisory Committee a draft of the final report. The main purposes of the Final Report are to provide guidance to ministers and senior officials on political decisions necessary for following up the project and to present the donor information on the use of funds. As such the final report will consist of a brief summary of the main products, findings, conclusions and recommendations for the project, without unnecessary background, descriptions or technical details. The report is aimed at people who are not necessarily technical specialists, who understand the implications for public policy of the findings and technical recommendations to ensure sustainability of the project results. The

final report will include an assessment of activities, a summary of training and recommendations expressed in terms of their practical application. This report shall specifically include the findings of the final evaluation, as described below. A project evaluation meeting should be held to discuss the draft Final Report with the Advisory Committee prior to its finalisation by the National Directorate and approval by the Steering Committee.

At the end of the first 24 months of the project there will be an Independent Interim Evaluation (IIE) with one or more independent consultants. The purpose of IIE is to review the progress and effectiveness of project execution in terms of the achievement of objectives, outcomes and outputs. The conclusions and recommendations will be crucial to bring about improvements in overall project design and execution strategy, if needed, for the remaining period of the project. The Steering Committee will complete necessary arrangements for the IIE, in consultation with the National Directorate and the Advisory Committee. The IIE shall include at the least the following elements:

-an analysis of the project's execution in terms of effectiveness, efficiency and compliance with set timeframes;
-an analysis of the effectiveness of the cooperation mechanisms between the parties;
identifying issues requiring decisions and corrective actions;
-a proposal for interim corrections and/or adjustments to the execution strategy, as necessary;
-a description of the technical achievements and lessons learned arising from design, execution and project management.

Shortly before the completion of the project an Independent Final Evaluation (IFE) will be made by one or more independent consultants. The purpose of the IFE is to describe project impacts, sustainability of results and the degree of achievement of long-term results. The IFE should also indicate any future actions needed to ensure the sustainability of project results, expand the impact in successive phases, integrate and increase products and practices and disseminate the information obtained amongst the authorities and institutions with competencies in adapting to climate change in rural areas, so as to ensure the continuity of the processes initiated by this project.

Some of the critical elements to which both the IIE and the IFE must pay particular attention are:
-the degree of acceptance and involvement of the beneficiaries, communities and local organizations in the information and alert systems established;
-the level of incorporation, among the direct beneficiaries, of practices from the agro technology transfer activities;
-the level of understanding and awareness among decision makers and beneficiaries of the need and importance of measures for adapting to climate change;
-the level achieved in terms of preparation, monitoring and adaptation;
-the reduction of negative impacts achieved in different areas (environmental, social, economic);
-the level of incorporation of measures to adapt to climate change in the policies and action plans and territorial development at regional level and their efficient implementation;
-the degree of participation and representation of women in the planning, training, and execution of project activities and the project's effect on the productive activities of the region.

The table below offers a summary of the main monitoring and evaluation reports, those

responsible for each and the deadlines:

M&E Activity	Responsible Party	Timeframe / Frequency	Budgeted Costs	Budgetary Reference
Launch Workshop	National Director, PMU and Advisory Committee	Three months from the start of the project	2.273	M&E included in project cost
Project Launch Report	PMU	days after the launch workshop	3.000	PMU and PTA are included in project cost
Field Impact Monitoring;	PMU; NIE	Ongoing	21.600	M&E included in project cost
Monitoring and Progress Evaluation Visits in AMR	Advisory Committee, National Director and PMU	Annual, or as needed	3.600	M&E included in project cost
Quarterly Status Reports (QSR)	National Director and PMU, with contributions from the executing institutions	Quarterly	14.400	PMU and PTA are included in project cost
Annual Management Reports (AMR)	National Director and PMU	Annual	3.450	PMU and PTA are included in project cost
Evaluation of Technical Reports	Advisory Committee, Executive Committee, National Director and PMU	As required	n.c.	PMU and PTA are included in project cost
Independent Interim Evaluation (IIE)	External consultant/s, National Director, PMU and others	Halfway through project implementation	15.000	M&E included in project cost
Independent Final Evaluation (IFE)	External consultant/s, National Director, PMU and others	At the end of project implementation	25.000	M&E included in project cost
Final Report	Advisory Committee, Executive Committee, National Director and PMU	Three months before the completion of Execution Agreement	6.000	PMU and PTA are included in project cost
TOTAL			**94.323**	

E. Include a results framework for the project proposal, including milestones, targets and indicators.

Objective/ Result	Indicator	Baseline	End-of-project target	Verification means	Risks and assumptions	Responsible
Project Objective: to increase the resilience capacity of rural farm communities in the coastal and inner dry lands of the O´Higgins region with respect to actual climate variation and future climate change	Number and type of institutions with the best capacity to minimise exposure to risks of climate variability. Number of people with reduced risk from extreme climatic events	Degradation of agricultural and livestock-based land is produced by improper practices. The younger generation migrates from the family farms to cities in search of better economic or working conditions and quality of life	Land degradation decreases by applying soil conservation techniques and appropriate soil, water and vegetation cover management practices. • 13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimize exposure to risks of climate variability. • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. • 558 holders (direct beneficiaries, at least 318 women) with reduced risk for extreme weather events. 20.000 litres of water per year newly available per holder. Household income increased in at least USD 1000/year. • At least 2208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5.000 ha with improved soil	Project reports. Access records, message logs, training records, direct interviews	Assumption: the exchange rate CLP/USD remains over 550	MINAGRI

Objective/ Result	Indicator	Baseline	End-of-project target	Verification means	Risks and assumptions	Responsible
			quality. Household income increased in at least USD 1000/year. • At least 4988 holders (100% of farmer population, direct beneficiaries, at least 1562 women) with reduced risk for extreme weather events (EWS 0-> 3). • At least 5343 (direct beneficiaries, at least 1673 women) farmers trained.			
Component 1.- Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock	13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimise exposure to risks of climate variability	Cultivable area of the O'Higgins region will be reduced by 44% and 68% respectively (scenario A2). The most vulnerable group of farmers (under 20 ha) includes 4988 farmers (1562 women) and their families.	Greater capacities for managing soil, livestock, water and crops. Community access to soil management machinery • 13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimize exposure to risks of climate variability. • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. • 558 holders (direct beneficiaries, at least 318 women) with reduced risk for extreme weather	Project reports: technical reports, annual reports; interim and final evaluations. Training records	Risk: climate change is more intense than projected by analyses and studies	MINAGRI (INIA)

Objective/ Result	Indicator	Baseline	End-of-project target	Verification means	Risks and assumptions	Responsible
			events. 20.000 litres of water per year newly available per holder. Household income increased in at least USD 1000/year. • At least 2208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5.000 ha with improved soil quality. Household income increased in at least USD 1000/year. • At least 5343 (direct beneficiaries, at least 1673 women) farmers trained.			
Result 1.1.- Implementation of a capacity building and training systems to increment the resilience capacity of farm communities vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management	Number of staff trained to respond to and mitigate impacts of climate events Increased staff capacity from selected institutions to respond to and mitigate impacts of climate events	Low level of access to technical and financial assistance. Low engagement with the agribusiness value chain and low participation in organisations	• At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. • At least 2208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5.000 ha with improved soil quality. Household income increased in at least USD 1000/year.	Project Reports: technical reports, annual reports; interim and final evaluations. Interviews with direct beneficiaries	Risk: the government or the institutions do not assign sufficient priority to the programme	MINAGRI (INIA)

Objective/ Result	Indicator	Baseline	End-of-project target	Verification means	Risks and assumptions	Responsible
			• At least 5343 (direct beneficiaries, at least 1673 women) farmers trained.			
Result 1.2.- Improve the decision supporting agroclimatic information management for actual climate and future climate changes for local MINAGRI professionals and farmer communities	Number of people affected by climate variability	Limited productive capacity. Small farmers face water shortages from November to April. They receive water in municipalities' tanks , but it is insufficient for the maintenance of agricultural activity	• At least 4988 holders (100% of farmer population, direct beneficiaries, at least 1562 women) with reduced risk for extreme weather events (EWS 0-> 3). • 558 holders (direct beneficiaries, at least 318 women) with reduced risk for extreme weather events. 20.000 litres of water per year newly available per holder. Household income increased in at least USD 1000/year. • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability.	Project Reports: technical reports, annual reports; interim and final evaluations. Interviews with direct beneficiaries	Risk: beneficiaries lack of incentive or financial capacity to invest in restoration or improvements can lead to ineffective results in land use and other expected results	MINAGRI
Component 2.- Installation of an information system for agro-climatic risk management and	Percentage of population covered by adequate systems for risk reduction	Small farmers lack agro-climatic information and capacities for agricultural decision making	Adequate information which is disseminated through appropriate means is generated. Along with training, it improves decision making.	Project Reports: technical reports, annual reports; interim and final evaluations.	Risk: the beneficiaries are resistant to changes in practices	MINAGRI (UNEA)

Objective/ Result	Indicator	Baseline	End-of-project target	Verification means	Risks and assumptions	Responsible
climate change adaptation		in changing- and extreme environments	• At least 4988 holders (100% of farmer population, direct beneficiaries, at least 1562 women) with reduced risk for extreme weather events (EWS 0-> 3). • 13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimize exposure to risks of climate variability.	Access and message logs	Risk: the government or the institutions do not assign sufficient priority to the programme	
Result 2.1.- Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region						

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Project Objective: to increase the resilience capacity of rural farm communities in the coastal and inner dry lands of the O´Higgins region with respect to actual climate variation and future climate change	Land degradation decreases by applying soil conservation techniques and appropriate soil, water and vegetation cover management practices. • 13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimize exposure to risks of climate variability. • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. • 558 vulnerable holders (direct beneficiaries, at least 318 women) with reduced risk for extreme weather events. 20.000 litres of water per year newly available per holder. Household income increased in at least USD 1000/year.	**Result 2**. Increased institutional capacity to reduce risks associated with socioeconomic and environmental losses induced by climate	**Indicator 2.1.** Number and type of institution with greater capacity for minimising exposure to risks of climate variability. • 13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimize exposure to risks of climate variability. • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. **Indicator 2.2.** Number of people with reduced risk from extreme weather events. • 558 vulnerable holders (direct beneficiaries, at least 318 women) with reduced risk for extreme weather events. 20.000	9 960 000

	• At least 2208 vulnerable farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5.000 ha with improved soil quality. Household income increased in at least USD 1000/year. • At least 5767 holders (100% of vulnerable farmer population, direct beneficiaries, at least 1562 women) with reduced risk for extreme weather events (EWS 0-> 3). • At least 5343 (direct beneficiaries, at least 1673 women) vulnerable farmers trained.		litres of water per year newly available per holder. Household income increased in at least USD 1000/year·household. • At least 2208 vulnerable farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5.000 ha with improved soil quality. Household income increased in at least USD 1000/year·household. • At least 5767 holders (100% of farmer population, direct beneficiaries, at least 1562 women) with reduced risk for extreme weather events (EWS 0-> 3). • At least 5343 (direct beneficiaries, at least 1673 women) vulnerable farmers trained.	

Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**

Result 1.1.- Implementation of a capacity building and training systems to increment the resilience capacity of farm communities vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management	• At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. • At least 2208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5.000 ha with improved soil quality. Household income increased in at least USD 1000/year. • At least 5343 (direct beneficiaries, at least 1673 women) farmers trained.	**Product 2.1**. Strengthened capacity of national and regional centres to quickly respond to extreme weather events	**Indicator 2.1.1.** Number of staff trained to respond to and mitigate impacts of climate events • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability. **Indicator 2.1.2.** Capacity of staff from selected institutions to respond and mitigate impacts of climate events • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability.	5 297 781
Result 1.2.- Improve the decision supporting agroclimatic information management for actual climate and future climate changes for local MINAGRI professionals and farmer communities	• At least 5767 holders (100% of farmer population, direct beneficiaries, at least 1562 vulnerable women) with reduced risk for extreme weather events (EWS 0-> 3). • 558 holders (direct beneficiaries, at least	**Product 2.2.** Groups of target population covered by adequate risk reduction systems	**Indicator 2.2.2.** Number of people affected by climate variability • At least 5767 holders (100% of farmer population, direct beneficiaries, at least 1562 vulnerable women) with reduced	3 305 470

	318 women) with reduced risk for extreme weather events. 20.000 litres of water per year newly available per holder. Household income increased in at least USD 1000/year. • At least 255 officials from 13 institutions (5 Ministry of Agriculture services and 8 municipalities) trained to minimise exposure to risks of climate variability.		risk for extreme weather events (EWS 0-> 3).	
Result 2.1.- Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region	Adequate information is generated which is disseminated through appropriate means. Along with training, it improves decision making. • At least 5767 holders (100% of farmer population, direct beneficiaries, at least 1562 vulnerable women) with reduced risk for extreme weather events (EWS 0-> 3). • 13 institutions (5 Ministry of Agriculture services and 8 municipalities) with greater capacity to minimize exposure to risks of climate variability.	**Product 2.2.** Groups of target population covered by adequate risk reduction systems	**Indicator 2.2.1.** Percentage of population covered by adequate risk reduction systems • At least 5767 holders (100% of farmer population, direct beneficiaries, at least 1562 vulnerable women) with reduced risk for extreme weather events (EWS 0-> 3).	406 748

G. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs. A summary of the budget, followed by a detailed budget is presented below (USD)

COMPONENT/RESULT/PRODUCT			INTERNATIONAL CONSULTANTS	NATIONAL CONSULTANTS	TRAVEL	EQUIPMENT	CONTRACTS	GOODS AND MATERIALS	TRAINING	TOTAL		
Component 1- Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock.	Result 1.1.- Implementation of a capacity building and training systems to increment the resilience capacity of farm communities vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management.	Output 1.1.1.- Creation of training and advisory teams for agro-technology transfer for each one of the 8 municipalities	-	454.377	24.359	285.912	31.304	1.044	23.503	**820.499**	**5.297.781**	**8.603.251**
		Output 1.1.2.- Implementation of 9 demonstration fields for agro-technology transfer (1.1.4, 1.1.5, 1.1.6 and 1.2.8)	-	411.857	24.359	-	1.733	182	-	**438.131**		
		Output 1.1.3.- Acquisition (including maintenance and operating costs) of agricultural machinery for the 9 demonstration fields	-	21.801	7.570	1.891.582	339.970	136.018	-	**2.396.940**		
		Output 1.1.4: Training in sustainable soil management	-	441.570	24.359	-	14.355	4.480	63.740	**548.504**		
		Output 1.1.5: Training in the use of crops, forage crops, fruit trees and livestock, tolerant to climate variability and climate change	-	441.570	24.359	-	12.622	36.055	47.376	**561.982**		
		Output 1.1.6: Training in efficient water management	-	446.325	24.359	-	12.622	1.044	47.376	**531.725**		
	Result 1.2.- Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region.	Output 1.2.7: Installation of rain water and surface runoff harvesting facilities in 558 farms including training	-	122.328	24.359	1.725.408	395.018	892.854	7.855	**3.167.821**	**3.305.470**	
		Output 1.2.8: Capacity building through knowledge sharing and good practice demonstrations	18.182	41.244	72.741	-	-	-	5.482	**137.649**		
Component 2.- Installation of an information system for agro-climatic risk management and climate change adaptation.	Result 2.1.- Improve the decision supporting agroclimatic information management for actual climate and future climate changes for local MINAGRI professionals and farmer communities.	Output 2.1.1. Strengthening of the existing network of automatic meteorological stations (AMS) in the project area	-	12.087	-	112.000	-	182	-	**124.269**	**406.748**	
		Output 2.1.2. Capacity building in weather and climate data analysis and its integration in meaningful decision-making for farm management	9.091	38.662	24.359	5.455	193.015	1.044	10.855	**282.479**		
Execution Cost			30.000	350.502	16.789	33.453	15.940	1.044	2.273	**450.000**		
Project Cost			**57.273**	**2.782.324**	**267.612**	**4.053.808**	**1.016.578**	**1.073.946**	**208.459**	**9.460.000**		

RESULTS-BASED BUDGET (USD)

Budget notes	Expected Concrete Outputs											
Concept	**1.1.1**	**1.1.2**	**1.1.3**	**1.1.4**	**1.1.5**	**1.1.6**	**1.2.7**	**1.2.8**	**2.1.1**	**2.1.2**	**EC**	**TOTAL**
INTERNATIONAL CONSULTANTS	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18.182**	**-**	**9.091**	**30.000**	**57.273**
Final evaluation	-	-	-	-	-	-	-	-	-	-	30.000	30.000
International consultants (soil biology 1 month, holistic management 1 month, flow rate indicators development 1 month)	-	-	-	-	-	-	-	18.182	-	9.091	-	27.273
NATIONAL CONSULTANTS	**454.377**	**411.857**	**21.801**	**441.570**	**441.570**	**446.325**	**122.328**	**41.244**	**12.087**	**38.662**	**350.502**	**2.782.324**
Dr. Agricultural Engineer PTA (INIA)	12.087	12.087	12.087	12.087	12.087	12.087	12.087	12.087	12.087	12.087	-	120.873
PMU coordinator	-	-	-	-	-	-	-	-	-	-	180.480	180.480
Agricultural Engineer (INIA, dry-land crops expert)	9.508	-	-	9.508	9.508	-	-	-	-	-	-	28.525
Agricultural Engineer (INIA irrigation system and water management specialist)	14.263	-	-	-	-	14.263	-	-	-	-	-	28.525
Agricultural Engineer (INIA, sheep management and livestock production specialist)	7.131	-	-	7.131	7.131	7.131	-	-	-	-	-	28.525
Agricultural Engineer (INIA, dryland grasslands specialist)	10.697	-	-	10.697	10.697	10.697	-	-	-	-	-	42.788
Agricultural Engineer (INIA, agricultural machinery specialist)	7.131	-	7.131	-	-	-	-	-	-	-	-	14.263
Agricultural Engineer (INIA, dryland production systems expert)	2.377	-	-	2.377	2.377	2.377	-	-	-	-	-	9.508
Agricultural Technician (INIA)	-	8.587	-	8.587	8.587	8.587	-	-	-	-	-	34.348
Administrative assistant (INIA)	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	-	-	-	16.721
Computer technician (INIA)	492	492	492	492	492	492	492	492	-	-	-	3.938
Interim evaluation	-	-	-	-	-	-	-	-	-	-	20.000	20.000
4 Agricultural Engineers for fieldwork, dissemination and training (2 municipalities per professional)	99.629	99.629	-	99.629	99.629	99.629	99.629	-	-	-	-	597.775
Rural communicator	-	-	-	-	-	-	-	26.575	-	26.575	-	53.149
9 agricultural technicians (1 per demonstration field + lab technician)	177.454	177.454	-	177.454	177.454	177.454	-	-	-	-	-	887.269
8 tractoristas (1 por campo demostrativo exc. Hidango) 8 tractor drivers (1 per demonstration field,except Hidango)	103.488	103.488	-	103.488	103.488	103.488	-	-	-	-	-	517.440
Field operator	8.029	8.029	-	8.029	8.029	8.029	8.029	-	-	-	-	48.175
Secretary (PMU)	-	-	-	-	-	-	-	-	-	-	56.727	56.727
Accounting Assistant (PMU)	-	-	-	-	-	-	-	-	-	-	93.295	93.295
TRAVEL	**24.359**	**24.359**	**7.570**	**24.359**	**24.359**	**24.359**	**24.359**	**72.741**	**-**	**24.359**	**16.789**	**267.612**
Daily allowance (1/2 day)	9.425	9.425	-	9.425	9.425	9.425	9.425	-	-	9.425	9.425	75.404
Full allowance (day with overnight stay)	7.364	7.364	-	7.364	7.364	7.364	7.364	-	-	7.364	7.364	58.909
Daily allowance abroad (Brasil, Argentina, MExico, Australia, Spain)	-	-	-	-	-	-	-	31.270	-	-	-	31.270
Fuel	5.205	5.205	5.205	5.205	5.205	5.205	5.205	5.205	-	5.205	-	46.844
Terminal and other expenses	1.733	1.733	1.733	1.733	1.733	1.733	1.733	1.733	-	1.733	-	15.600
Toll	257	257	257	257	257	257	257	257	-	257	-	2.309
Mainline toll	116	116	116	116	116	116	116	116	-	116	-	1.047
Air tickets (Brasil, Argentina, MExico, Australia, Spain)	-	-	-	-	-	-	-	33.902	-	-	-	33.902
Bus tickets	259	259	259	259	259	259	259	259	-	259	-	2.327
EQUIPMENT	**285.912**	**-**	**1.891.582**	**-**	**-**	**-**	**1.725.408**	**-**	**112.000**	**5.455**	**33.453**	**4.053.808**

Budget notes	Expected Concrete Outputs											
Concept	**1.1.1**	**1.1.2**	**1.1.3**	**1.1.4**	**1.1.5**	**1.1.6**	**1.2.7**	**1.2.8**	**2.1.1**	**2.1.2**	**EC**	**TOTAL**
115 Hp tractor (incl. insurance, registration certificate and license plate)	-	-	371.295	-	-	-	-	-	-	-	-	371.295
Backhoe (incl. insurance, registration certificate and license plate)	-	-	85.720	-	-	-	-	-	-	-	-	85.720
Pickup truck (incl. Insurance, registration certificate and license plate)	-	-	188.841	-	-	-	-	-	-	-	-	188.841
3/4 Lorry (incl. Insurance, registration certificate and license plate)	-	-	42.909	-	-	-	-	-	-	-	-	42.909
Tank and manual pump for fuel	-	-	3.850	-	-	-	-	-	-	-	-	3.850
Five point scarifier plough	-	-	69.265	-	-	-	-	-	-	-	-	69.265
Five-chisel chisel plough	-	-	53.556	-	-	-	-	-	-	-	-	53.556
24 disc harrow	-	-	46.967	-	-	-	-	-	-	-	-	46.967
Vibrocultivator	-	-	32.307	-	-	-	-	-	-	-	-	32.307
Stubble cultivator	-	-	62.822	-	-	-	-	-	-	-	-	62.822
Drill planter zero tillage	-	-	159.229	-	-	-	-	-	-	-	-	159.229
Pasture regenerating machine	-	-	133.425	-	-	-	-	-	-	-	-	133.425
Manure Spreader	-	-	52.698	-	-	-	-	-	-	-	-	52.698
Boom sprayer	-	-	85.236	-	-	-	-	-	-	-	-	85.236
Manual hay baler	-	-	50.385	-	-	-	-	-	-	-	-	50.385
Wheat and quinoa seeder	-	-	7.964	-	-	-	-	-	-	-	-	7.964
Strawberry picking assistant	-	-	12.240	-	-	-	-	-	-	-	-	12.240
Stubble chipper	-	-	6.778	-	-	-	-	-	-	-	-	6.778
Flatbed wagon	-	-	47.709	-	-	-	-	-	-	-	-	47.709
Watering pumps 0.5 HP	-	-	-	-	-	-	66.494	-	-	-	-	66.494
Watering pumps 0.25 HP	-	-	-	-	-	-	6.629	-	-	-	-	6.629
Total station	5.240	-	5.240	-	-	-	-	-	-	-	-	10.480
Laser level	3.966	-	3.966	-	-	-	-	-	-	-	-	7.933
Software license for planimetry, topography and planimeter	6.036	-	6.036	-	-	-	-	-	-	-	-	12.071
Electric fence (including solar panel and batteries)	-	-	40.222	-	-	-	-	-	-	-	-	40.222
Mobile solar panels to generate electricity	-	-	-	-	-	-	1.146.960	-	-	-	-	1.146.960
Farm wind turbine	-	-	159.644	-	-	-	-	-	-	-	-	159.644
Water treatment equipment	-	-	79.756	-	-	-	-	-	-	-	-	79.756
Honey extractor	-	-	56.880	-	-	-	-	-	-	-	-	56.880
5,400 litre tanks	-	-	-	-	-	-	214.927	-	-	-	-	214.927
Portable 10,000 litre tanks	-	-	-	-	-	-	231.298	-	-	-	-	231.298
Water purifier	-	-	20.945	-	-	-	-	-	-	-	-	20.945
Water filter	-	-	-	-	-	-	59.100	-	-	-	-	59.100
Set of tools (spades, drill, hammers, circular saw, saw, ladders, other)	-	-	5.695	-	-	-	-	-	-	-	-	5.695
Automatic weather stations	-	-	-	-	-	-	-	-	112.000	-	-	112.000
Field measurement kit (digital and pocket penetrometer, set of augers, soil moisture meter with data logger, soil temperature meter with data logger, foliar area meter, photosynthesis meter, porometer, double cylinder infiltrometer , GPS, 200 cylinders for soil sampling)	222.846	-	-	-	-	-	-	-	-	-	-	222.846

Budget notes	Expected Concrete Outputs											
Concept	**1.1.1**	**1.1.2**	**1.1.3**	**1.1.4**	**1.1.5**	**1.1.6**	**1.2.7**	**1.2.8**	**2.1.1**	**2.1.2**	**EC**	**TOTAL**
Laboratory instrument kit (porous plates 1, 5 and 15 atm, meters to measure structural stability in the dry and wet, hydrometer, magnetic stirrer, meter for measuring air flow in soil cores, 270 litre oven, scales, universal centrifuge, Casagrande spoon, 30 one litre measuring cylinders)	47.823	-	-	-	-	-	-	-	-	-	-	47.823
Desk and chair	-	-	-	-	-	-	-	-	-	-	4.028	4.028
Filing cabinet	-	-	-	-	-	-	-	-	-	-	3.578	3.578
External hard disc	-	-	-	-	-	-	-	-	-	-	1.324	1.324
Notebook	-	-	-	-	-	-	-	-	-	-	7.942	7.942
PC	-	-	-	-	-	-	-	-	-	-	4.211	4.211
PC with capacity to process images	-	-	-	-	-	-	-	-	-	5.455	-	5.455
Tablet	-	-	-	-	-	-	-	-	-	-	4.745	4.745
Photographic camera	-	-	-	-	-	-	-	-	-	-	3.533	3.533
Video camera with tripod	-	-	-	-	-	-	-	-	-	-	1.501	1.501
Data Show incl. screen	-	-	-	-	-	-	-	-	-	-	1.935	1.935
Pendrive	-	-	-	-	-	-	-	-	-	-	657	657
CONTRACTS	**31.304**	**1.733**	**339.970**	**14.355**	**12.622**	**12.622**	**395.018**	**-**	**-**	**193.015**	**15.940**	**1.016.578**
Installation of electrical junction. Transformer	-	-	57.455	-	-	-	-	-	-	-	-	57.455
Provision of fitted out containers (office and store in demonstration units, project laboratory in Hidango)	-	-	84.878	-	-	-	-	-	-	-	-	84.878
Provision of 8x4 storeroom to store equipment	-	-	149.353	-	-	-	-	-	-	-	-	149.353
Conditioning of offices for INIA Hidango demonstration unit and PMU	-	-	-	10.909	10.909	10.909	-	-	-	10.909	10.909	54.545
Project webpage	-	-	-	-	-	-	-	-	-	-	5.031	5.031
Drone flight service (topographic, soil, water sources and vegetation characterization)	-	-	23.529	-	-	-	-	-	-	23.529	-	47.058
Heavy machinery freight service	-	-	6.109	-	-	-	-	-	-	-	-	6.109
Construction services for rainwater harvesting units and greenhouses (including taxes)	-	-	-	-	-	-	373.911	-	-	-	-	373.911
Soil fertility analysis services	-	1.733	-	1.733	-	-	1.733	-	-	-	-	5.200
Printing service for project folders	1.713	-	-	1.713	1.713	1.713	-	-	-	1.713	-	8.564
Printing services for promotional material. Hats, pens, other	2.364	-	-	-	-	-	-	-	-	2.364	-	4.727
Sign printing service for project demonstration units	-	-	6.545	-	-	-	-	-	-	-	-	6.545
Topography Service (survey of 8 demonstration units and design of soil conservation systems)	-	-	9.828	-	-	-	9.828	-	-	-	-	19.656
Water prospecting service	-	-	2.273	-	-	-	2.273	-	-	-	-	4.545
Consultancy on beekeeping	-	-	-	-	-	-	7.273	-	-	-	-	7.273
Consultancy on determining agroclimatic indicators	-	-	-	-	-	-	-	-	-	63.636	-	63.636
Consultancy on defining appropriate communication strategies, information dissemination and training	-	-	-	-	-	-	-	-	-	63.636	-	63.636
Radio advertising services in the O'Higgins Region	6.545	-	-	-	-	-	-	-	-	6.545	-	13.091
Professional communication services for project activities (production of documentaries, videos, releases, etc.)	20.682	-	-	-	-	-	-	-	-	20.682	-	41.364
GOODS AND MATERIALS	**1.044**	**182**	**136.018**	**4.480**	**36.055**	**1.044**	**892.854**	**-**	**182**	**1.044**	**1.044**	**1.073.946**

Budget notes	Expected Concrete Outputs											
Concept	**1.1.1**	**1.1.2**	**1.1.3**	**1.1.4**	**1.1.5**	**1.1.6**	**1.2.7**	**1.2.8**	**2.1.1**	**2.1.2**	**EC**	**TOTAL**
Various materials (including reams of paper, printer cartridges, note books, pencils, folders, CDs, DVDs, DVD stickers, printer toner and other)	1.044	-	-	1.044	1.044	1.044	-	-	-	1.044	1.044	6.264
Wood for signs for demonstration units, nails, and other	-	-	8.145	-	-	-	-	-	-	-	-	8.145
Native plants (quillay, boldo, etc.)	-	-	-	-	-	-	41.236	-	-	-	-	41.236
Hives	-	-	-	-	-	-	52.190	-	-	-	-	52.190
Set of materials and supplies for beekeeping (spatula, decanter, antibiotics, wax, etc.)	-	-	-	-	-	-	21.288	-	-	-	-	21.288
Individual occupational hazards prevention equipment	-	-	10.545	-	-	-	-	-	-	-	-	10.545
Field supplies (fertilizers, herbicides, seeds, greenhouse plastic)	-	-	-	-	-	-	280.407	-	-	-	-	280.407
Ram and twin-lamb ewes	-	-	-	-	21.993	-	-	-	-	-	-	21.993
Livestock-breeding inputs (dietary supplements, vaccines)	-	-	-	-	13.018	-	-	-	-	-	-	13.018
Impregnated poles, wood, other for greenhouses and hydroponic systems	-	-	-	-	-	-	380.405	-	-	-	-	380.405
Identifiers for inventoried goods	-	182	182	-	-	-	182	-	182	-	-	727
Various materials (reagents and laboratory materials)	-	-	-	3.436	-	-	-	-	-	-	-	3.436
Bird guano for enhancement of physical, chemical and biological soil fertility	-	-	17.219	-	-	-	17.219	-	-	-	-	34.438
Materials for drip irrigation systems (tapes, droppers, etc.)	-	-	99.926	-	-	-	99.926	-	-	-	-	199.852
TRAINING	**23.503**	**-**	**-**	**63.740**	**47.376**	**47.376**	**7.855**	**5.482**	**-**	**10.855**	**2.273**	**208.459**
Service for renting auditorium and training rooms	-	-	-	3.000	3.000	3.000	-	-	-	3.000	-	12.000
Project launch	-	-	-	-	-	-	-	-	-	-	2.273	2.273
Service for designing and making protective awnings for the sun and rain for field days	-	-	-	-	-	-	-	5.482	-	-	-	5.482
Services for layout of publications and informative material	-	-	-	3.309	3.309	3.309	-	-	-	-	-	9.927
Printing services for informative booklet	-	-	-	3.491	3.491	3.491	-	-	-	-	-	10.473
Printing service for manual on soil and water management for dryland, 200 pages	-	-	-	16.364	-	-	-	-	-	-	-	16.364
Publication and dissemination services in regional and national media	-	-	-	2.291	2.291	2.291	-	-	-	-	-	6.873
Outreach activities in rural schools	1.636	-	-	1.636	1.636	1.636	-	-	-	-	-	6.545
Training courses for farmers and technicians	7.855	-	-	7.855	7.855	7.855	7.855	-	-	7.855	-	47.127
Field Days at demonstration units	5.865	-	-	5.865	5.865	5.865	-	-	-	-	-	23.459
Printing and photocopying of training materials	3.545	-	-	3.545	3.545	3.545	-	-	-	-	-	14.182
Printing of field day canvas	675	-	-	675	675	675	-	-	-	-	-	2.700
Materials for project training (pens and other)	3.927	-	-	3.927	3.927	3.927	-	-	-	-	-	15.709
Van rental	-	-	-	11.782	11.782	11.782	-	-	-	-	-	35.345
TOTAL	**20.499**	**438.131**	**2.396.940**	**548.504**	**561.982**	**531.725**	**3.167.821**	**137.649**	**124.269**	**282.479**	**450.000**	**9.460.000**

OPERATIONAL BUDGET (USD)

Concept	Year 1	Year 2	Year 3	Year 4	TOTAL
INTERNATIONAL CONSULTANTS	**-**	**27.273**	**-**	**30.000**	**57.273**
Final evaluation	-	-	-	30.000	30.000
International consultants (soil biology 1 month, holistic management 1 month, flow rate indicators development 1 month)	-	27.273	-	-	27.273
NATIONAL CONSULTANTS	**605.327**	**785.410**	**801.216**	**590.370**	**2.782.324**
Dr. Agricultural Engineer PTA (INIA)	30.218	30.218	30.218	30.218	120.873
PMU coordinator	45.120	45.120	45.120	45.120	180.480
Agricultural Engineer (INIA, dry-land crops expert)	7.131	9.508	9.508	2.377	28.525
Agricultural Engineer (INIA irrigation system and water management specialist)	7.131	9.508	9.508	2.377	28.525
Agricultural Engineer (INIA, sheep management and livestock production specialist)	7.131	9.508	9.508	2.377	28.525
Agricultural Engineer (INIA, dryland grasslands specialist)	10.697	14.263	14.263	3.566	42.788
Agricultural Engineer (INIA, agricultural machinery specialist)	7.131	7.131	-	-	14.263
Agricultural Engineer (INIA, dryland production systems expert)	2.377	4.754	2.377	-	9.508
Agricultural Technician (INIA)	8.587	8.587	8.587	8.587	34.348
Administrative assistant (INIA)	4.180	4.180	4.180	4.180	16.721
Computer technician (INIA)	985	985	985	985	3.938
Interim evaluation	-	-	20.000	-	20.000
4 Agricultural Engineers for fieldwork, dissemination and training (2 municipalities per professional)	128.095	170.793	170.793	128.095	597.775
Rural communicator	-	15.945	21.260	15.945	53.149
9 agricultural technicians (1 per demonstration field + lab technician)	190.129	253.505	253.505	190.129	887.269
8 tractoristas (1 por campo demostrativo exc. Hidango) 8 tractor drivers (1 per demonstration field,except Hidango)	110.880	147.840	147.840	110.880	517.440
Field operator	8.029	16.058	16.058	8.029	48.175
Secretary (PMU)	14.182	14.182	14.182	14.182	56.727
Accounting Assistant (PMU)	23.324	23.324	23.324	23.324	93.295
TRAVEL	**44.602**	**89.204**	**89.204**	**44.602**	**267.612**
Daily allowance (1/2 day)	12.567	25.135	25.135	12.567	75.404
Full allowance (day with overnight stay)	9.818	19.636	19.636	9.818	58.909
Daily allowance abroad (Brasil, Argentina, MŽxico, Australia, Espa–a)	5.212	10.423	10.423	5.212	31.270
Fuel	7.807	15.615	15.615	7.807	46.844
Terminal and other expenses	2.600	5.200	5.200	2.600	15.600
Toll	385	770	770	385	2.309
Mainline toll	175	349	349	175	1.047
Air tickets (Brasil, Argentina, MŽxico, Australia, Espa–a)	5.650	11.301	11.301	5.650	33.902
Bus tickets	388	776	776	388	2.327
EQUIPMENT	**512.602**	**2.337.082**	**859.043**	**345.082**	**4.053.808**
115 Hp tractor (incl. insurance, registration certificate and license plate)	-	371.295	-	-	371.295
Backhoe (incl. insurance, registration certificate and license plate)	-	85.720	-	-	85.720
Pickup truck (incl. Insurance, registration certificate and license plate)	-	188.841	-	-	188.841
3/4 Lorry (incl. Insurance, registration certificate and license plate)	-	42.909	-	-	42.909

Tank and manual pump for fuel	-	3.850	-	-	3.850
Five point scarifier plough	-	69.265	-	-	69.265
Five-chisel chisel plough	-	53.556	-	-	53.556
24 disc harrow	-	46.967	-	-	46.967
Vibrocultivator	-	32.307	-	-	32.307
Stubble cultivator	-	62.822	-	-	62.822
Drill planter zero tillage	-	159.229	-	-	159.229
Pasture regenerating machine	-	133.425	-	-	133.425
Manure Spreader	-	52.698	-	-	52.698
Boom sprayer	-	85.236	-	-	85.236
Manual hay baler	-	50.385	-	-	50.385
Wheat and quinoa seeder	-	7.964	-	-	7.964
Strawberry picking assistant	-	12.240	-	-	12.240
Stubble chipper	-	6.778	-	-	6.778
Flatbed wagon	-	47.709	-	-	47.709
Watering pumps 0.5 HP	6.649	19.948	26.597	13.299	66.494
Watering pumps 0.25 HP	663	1.989	2.652	1.326	6.629
Total station	10.480	-	-	-	10.480
Laser level	7.933	-	-	-	7.933
Software license for planimetry, topography and planimeter	12.071	-	-	-	12.071
Electric fence (including solar panel and batteries)	-	40.222	-	-	40.222
Mobile solar panels to generate electricity	114.696	344.088	458.784	229.392	1.146.960
Farm wind turbine	-	159.644	-	-	159.644
Water treatment equipment	-	79.756	-	-	79.756
Honey extractor	-	-	56.880	-	56.880
5,400 litre tanks	21.493	64.478	85.971	42.985	214.927
Portable 10,000 litre tanks	23.130	69.389	92.519	46.260	231.298
Water purifier	-	20.945	-	-	20.945
Water filter	5.910	17.730	23.640	11.820	59.100
Set of tools (spades, drill, hammers, circular saw, saw, ladders, other)	-	5.695	-	-	5.695
Automatic weather stations	-	-	112.000	-	112.000
Field measurement kit (digital and pocket penetrometer, set of augers, soil moisture meter with data logger, soil temperature meter with data logger, foliar area meter, photosynthesis meter, porometer, double cylinder infiltrometer , GPS, 200 cylinders for soil sampling)	222.846	-	-	-	222.846
Laboratory instrument kit (porous plates 1, 5 and 15 atm, meters to measure structural stability in the dry and wet, hydrometer, magnetic stirrer, meter for measuring air flow in soil cores, 270 litre oven, scales, universal centrifuge, Casagrande spoon, 30 one litre measuring cylinders)	47.823	-	-	-	47.823
Desk and chair	4.028	-	-	-	4.028
Filing cabinet	3.578	-	-	-	3.578
External hard disc	1.324	-	-	-	1.324
Notebook	7.942	-	-	-	7.942

PC	4.211	-	-	-	4.211
PC with capacity to process images	5.455	-	-	-	5.455
Tablet	4.745	-	-	-	4.745
Photographic camera	3.533	-	-	-	3.533
Video camera with tripod	1.501	-	-	-	1.501
Data Show incl. screen	1.935	-	-	-	1.935
Pendrive	657	-	-	-	657
CONTRACTS	**485.609**	**198.692**	**243.249**	**89.029**	**1.016.578**
Installation of electrical junction. Transformer	57.455	-	-	-	57.455
Provision of fitted out containers (office and store in demonstration units, project laboratory in Hidango)	84.878	-	-	-	84.878
Provision of 8x4 storeroom to store equipment	149.353	-	-	-	149.353
Conditioning of offices for INIA Hidango demonstration unit and PMU	54.545	-	-	-	54.545
Project webpage	5.031	-	-	-	5.031
Drone flight service (topographic, soil, water sources and vegetation characterization)	47.058	-	-	-	47.058
Heavy machinery freight service	-	2.444	2.444	1.222	6.109
Construction services for rainwater harvesting units and greenhouses (including taxes)	37.391	112.173	149.564	74.782	373.911
Soil fertility analysis services	520	1.560	2.080	1.040	5.200
Printing service for project folders	4.282	-	4.282	-	8.564
Printing services for promotional material. Hats, pens, other	2.364	-	2.364	-	4.727
Sign printing service for project demonstration units	6.545	-	-	-	6.545
Topography Service (survey of 8 demonstration units and design of soil conservation systems)	19.656	-	-	-	19.656
Water prospecting service	4.545	-	-	-	4.545
Consultancy on beekeeping	1.818	1.818	1.818	1.818	7.273
Consultancy on determining agroclimatic indicators	-	63.636	-	-	63.636
Consultancy on defining appropriate communication strategies, information dissemination and training	-	-	63.636	-	63.636
Radio advertising services in the O'Higgins Region	3.273	3.273	3.273	3.273	13.091
Professional communication services for project activities (production of documentaries, videos, releases, etc.)	6.894	13.788	13.788	6.894	41.364
GOODS AND MATERIALS	**124.228**	**334.247**	**408.490**	**206.981**	**1.073.946**
Various materials (including reams of paper, printer cartridges, note books, pencils, folders, CDs, DVDs, DVD stickers, printer toner and other)	1.566	1.566	1.566	1.566	6.264
Wood for signs for demonstration units, nails, and other	8.145	-	-	-	8.145
Native plants (quillay, boldo, etc.)	4.124	12.371	16.495	8.247	41.236
Hives	5.219	15.657	20.876	10.438	52.190
Set of materials and supplies for beekeeping (spatula, decanter, antibiotics, wax, etc.)	2.129	6.386	8.515	4.258	21.288
Individual occupational hazards prevention equipment	10.545	-	-	-	10.545
Field supplies (fertilizers, herbicides, seeds, greenhouse plastic)	28.041	84.122	112.163	56.081	280.407
Ram and twin-lamb ewes	-	21.993	-	-	21.993

Livestock-breeding inputs (dietary supplements, vaccines)	-	5.207	3.905	3.905	13.018
Impregnated poles, wood, other for greenhouses and hydroponic systems	38.041	114.122	152.162	76.081	380.405
Identifiers for inventoried goods	121	242	242	121	727
Various materials (reagents and laboratory materials)	573	1.145	1.145	573	3.436
Bird guano for enhancement of physical, chemical and biological soil fertility	5.740	11.479	11.479	5.740	34.438
Materials for drip irrigation systems (tapes, droppers, etc.)	19.985	59.956	79.941	39.970	199.852
TRAINING	**37.531**	**61.402**	**63.441**	**46.084**	**208.459**
Service for renting auditorium and training rooms	2.000	4.000	4.000	2.000	12.000
Project launch	2.273	-	-	-	2.273
Service for designing and making protective awnings for the sun and rain for field days	-	-	5.482	-	5.482
Services for layout of publications and informative material	4.964	4.964	-	-	9.927
Printing services for informative booklet	2.095	3.142	4.189	1.047	10.473
Printing service for manual on soil and water management for dryland, 200 pages	-	-	-	16.364	16.364
Publication and dissemination services in regional and national media	3.436	3.436	-	-	6.873
Outreach activities in rural schools	1.091	2.182	2.182	1.091	6.545
Training courses for farmers and technicians	7.855	15.709	15.709	7.855	47.127
Field Days at demonstration units	-	7.820	11.729	3.910	23.459
Printing and photocopying of training materials	2.364	4.727	4.727	2.364	14.182
Printing of field day canvas	-	1.350	1.350	-	2.700
Materials for project training (pens and other)	2.618	5.236	5.236	2.618	15.709
Van rental	8.836	8.836	8.836	8.836	35.345
TOTAL	**1.809.899**	**3.833.310**	**2.464.643**	**1.352.148**	**9.460.000**

INPUT LIST

Budget notes					
Concept	**Measurement Unit**	**Unit Cost (CLP)**	**No. of Units**	**Cost (CLP)**	**COST (USD)**
115 Hp tractor (incl. insurance, registration certificate and license plate)	Unit	25.526.500	8	204.212.000	371.295
24 disc harrow	Unit	6.458.000	4	25.832.000	46.967
3/4 Lorry (incl. Insurance, registration certificate and license plate)	Unit	23.600.000	1	23.600.000	42.909
4 Agricultural Engineers for fieldwork, dissemination and training (2 municipalities per professional)	100%	1.957.000	168	328.776.000	597.775
5,400 litre tanks	Unit	258.100	458	118.209.800	214.927
8 tractoristas (1 por campo demostrativo exc. Hidango) 8 tractor drivers (1 per demonstration field,except Hidango)	100%	847.000	336	284.592.000	517.440
9 agricultural technicians (1 per demonstration field + lab technician)	100%	1.291.000	378	487.998.000	887.269
Accounting Assistant (PMU)	100%	1.069.000	48	51.312.000	93.295
Administrative assistant (INIA)	20%	958.000	48	9.196.800	16.721
Agricultural Engineer (INIA irrigation system and water management specialist)	20%	2.179.000	36	15.688.800	28.525
Agricultural Engineer (INIA, *dryland* grasslands specialist)	30%	2.179.000	36	23.533.200	42.788
Agricultural Engineer (INIA, agricultural machinery specialist)	20%	2.179.000	18	7.844.400	14.263
Agricultural Engineer (INIA, dry-land crops expert)	20%	2.179.000	36	15.688.800	28.525
Agricultural Engineer (INIA, *dryland* production systems expert)	10%	2.179.000	24	5.229.600	9.508
Agricultural Engineer (INIA, sheep management and livestock production specialist)	20%	2.179.000	36	15.688.800	28.525
Agricultural Technician (INIA)	35%	1.124.500	48	18.891.600	34.348
Air tickets (Brasil, Argentina, Mexico, Australia, Spain)	Unit	932.300	20	18.646.000	33.902
Automatic weather stations	Unit	15.400.000	4	61.600.000	112.000
Backhoe (incl. insurance, registration certificate and license plate)	Unit	47.146.000	1	47.146.000	85.720
Bird guano for enhancement of physical, chemical and biological soil fertility	m^3	7.285	2.600	18.941.000	34.438
Boom sprayer	Unit	5.860.000	8	46.880.000	85.236
Bus tickets	Unit	16.000	80	1.280.000	2.327
Computer technician (INIA)	5%	902.500	48	2.166.000	3.938
Conditioning of offices for INIA Hidango demonstration unit and PMU	Lump sum	30.000.000	1	30.000.000	54.545
Construction services for rainwater harvesting units and greenhouses (including taxes)	Unit	362.700	567	205.650.900	373.911
Consultancy on beekeeping	Unit	4.000.000	1	4.000.000	7.273
Consultancy on defining appropriate communication strategies, information dissemination and training	Unit	35.000.000	1	35.000.000	63.636
Consultancy on determining agroclimatic indicators	Unit	35.000.000	1	35.000.000	63.636
Daily allowance (1/2 day)	Unit	18.000	2.304	41.472.000	75.404
Daily allowance abroad (Brasil, Argentina, México, Australia, Spain)	Unit	132.295	130	17.198.409	31.270
Data Show incl. screen	Unit	532.000	2	1.064.000	1.935

Desk and chair	Unit	184.600	12	2.215.200	4.028
Dr. Agricultural Engineer PTA (INIA)	50%	2.770.000	48	66.480.000	120.873
Drill planter zero tillage	Unit	10.947.000	8	87.576.000	159.229
Drone flight service (topographic, soil, water sources and vegetation characterization)	Unit	12.941.000	2	25.882.000	47.058
Electric fence (including solar panel and batteries)	Unit	2.458.000	9	22.122.000	40.222
External hard disc	Unit	72.800	10	728.000	1.324
Farm wind turbine	Unit	9.756.000	9	87.804.000	159.644
Field Days at demonstration units	Unit	358.400	36	12.902.400	23.459
Field measurement kit (digital and pocket penetrometer, set of augers, soil moisture meter with data logger, soil temperature meter with data logger, foliar area meter, photosynthesis meter, porometer, double cylinder infiltrometer , GPS, 200 cylinders for soil sampling)	Unit	15.320.680	8	122.565.440	222.846
Field operator	100%	736.000	36	26.496.000	48.175
Field supplies (fertilizers, herbicides, seeds, greenhouse plastic)	Lump sum	272.000	567	154.224.000	280.407
Filing cabinet	Unit	164.000	12	1.968.000	3.578
Final evaluation	Unit	16.500.000	1	16.500.000	30.000
Five point scarifier plough	Unit	4.762.000	8	38.096.000	69.265
Five-chisel chisel plough	Unit	3.682.000	8	29.456.000	53.556
Flatbed wagon	Unit	3.280.000	8	26.240.000	47.709
Fuel	Liter	950	27.120	25.764.000	46.844
Full allowance (day with overnight stay)	Unit	45.000	720	32.400.000	58.909
Heavy machinery freight service	Unit	280.000	12	3.360.000	6.109
Hives	Unit	101.250	284	28.704.375	52.190
Honey extractor	Unit	3.476.000	9	31.284.000	56.880
Identifiers for inventoried goods	Lump sum	400.000	1	400.000	727
Impregnated poles, wood, other for greenhouses and hydroponic systems	Lump sum	369.000	567	209.223.000	380.405
Individual occupational hazards prevention equipment	Lump sum	290.000	20	5.800.000	10.545
Installation of electrical junction. Transformer	Unit	3.950.000	8	31.600.000	57.455
Interim evaluation	Lump sum	11.000.000	1	11.000.000	20.000
International consultants (soil biology 1 month, holistic management 1 month, flow rate indicators development 1 month)	Month	5.000.000	3	15.000.000	27.273
Laboratory instrument kit (porous plates 1, 5 and 15 atm, meters to measure structural stability in the dry and wet, hydrometer, magnetic stirrer, meter for measuring air flow in soil cores, 270 litre oven, scales, universal centrifuge, Casagrande spoon, 30 one litre measuring cylinders)	Unit	26.302.860	1	26.302.860	47.823
Laser level	Unit	4.363.000	1	4.363.000	7.933
Livestock-breeding inputs (dietary supplements, vaccines)	Lump sum	106.548	67	7.160.000	13.018
Mainline toll	Unit	600	960	576.000	1.047
Manual hay baler	Unit	3.464.000	8	27.712.000	50.385
Manure Spreader	Unit	7.246.000	4	28.984.000	52.698

Materials for drip irrigation systems (tapes, droppers, etc.)	Lump sum	193.860	567	109.918.620	199.852
Materials for project training (pens and other)	Unit	1.600	5.400	8.640.000	15.709
Mobile solar panels to generate electricity	Unit	5.841.000	108	630.828.000	1.146.960
Native plants (quillay, boldo, etc.)	Unit	1.600	14.175	22.680.000	41.236
Notebook	Unit	546.000	8	4.368.000	7.942
Outreach activities in rural schools	Unit	150.000	24	3.600.000	6.545
Pasture regenerating machine	Unit	18.346.000	4	73.384.000	133.425
PC	Unit	386.000	6	2.316.000	4.211
PC with capacity to process images	Unit	1.000.000	3	3.000.000	5.455
Pendrive	Unit	8.600	42	361.200	657
Photographic camera	Unit	388.600	5	1.943.000	3.533
Pickup truck (incl. Insurance, registration certificate and license plate)	Unit	12.982.800	8	103.862.400	188.841
PMU coordinator	100%	2.068.000	48	99.264.000	180.480
Portable 10,000 litre tanks	Unit	1.167.100	109	127.213.900	231.298
Printing and photocopying of training materials	Unit	65	120.000	7.800.000	14.182
Printing of field day canvas	Unit	165.000	9	1.485.000	2.700
Printing service for manual on soil and water management for dryland, 200 pages	Unit	3.000	3.000	9.000.000	16.364
Printing service for project folders	Unit	1.570	3.000	4.710.000	8.564
Printing services for informative booklet	Unit	480.000	12	5.760.000	10.473
Printing services for promotional material. Hats, pens, other	Unit	2.600.000	1	2.600.000	4.727
Professional communication services for project activities (production of documentaries, videos, releases, etc.)	Unit	3.250.000	7	22.750.000	41.364
Project launch	Unit	1.250.000	1	1.250.000	2.273
Project webpage	Lump sum	2.767.000	1	2.767.000	5.031
Provision of 8x4 storeroom to store equipment	Unit	10.268.000	8	82.144.000	149.353
Provision of fitted out containers (office and store in demonstration units, project laboratory in Hidango)	Unit	5.187.000	9	46.683.000	84.878
Publication and dissemination services in regional and national media	Unit	210.000	18	3.780.000	6.873
Radio advertising services in the O'Higgins Region	Unit	180.000	40	7.200.000	13.091
Ram and twin-lamb ewes	Unit	180.000	67	12.096.000	21.993
Rural communicator	100%	1.624.000	18	29.232.000	53.149
Secretary (PMU)	100%	650.000	48	31.200.000	56.727
Service for designing and making protective awnings for the sun and rain for field days	Unit	335.000	9	3.015.000	5.482
Service for renting auditorium and training rooms	Day	220.000	30	6.600.000	12.000
Services for layout of publications and informative material	month	420.000	13	5.460.000	9.927
Set of materials and supplies for beekeeping (spatula, decanter, antibiotics, wax, etc.)	Unit	206.500	57	11.708.550	21.288
Set of tools (spades, drill, hammers, circular saw, saw, ladders, other)	Unit	348.000	9	3.132.000	5.695
Sign printing service for project demonstration units	Unit	225.000	16	3.600.000	6.545
Software license for planimetry, topography and planimeter	Unit	1.106.540	6	6.639.240	12.071

Soil fertility analysis services	Unit	28.600	100	2.860.000	5.200
Strawberry picking assistant	Unit	3.366.000	2	6.732.000	12.240
Stubble chipper	Unit	1.864.000	2	3.728.000	6.778
Stubble cultivator	Unit	8.638.000	4	34.552.000	62.822
Tablet	Unit	290.000	9	2.610.000	4.745
Tank and manual pump for fuel	Unit	264.700	8	2.117.600	3.850
Terminal and other expenses	Unit	66.000	130	8.580.000	15.600
Toll	Unit	2.100	605	1.270.080	2.309
Topography Service (survey of 8 demonstration units and design of soil conservation systems)	Unit	10.811.000	1	10.811.000	19.656
Total station	Unit	5.764.000	1	5.764.000	10.480
Training courses for farmers and technicians	Unit	480.000	54	25.920.000	47.127
Van rental	Day	120.000	162	19.440.000	35.345
Various materials (including reams of paper, printer cartridges, note books, pencils, folders, CDs, DVDs, DVD stickers, printer toner and other)	Lump sum	3.445.000	1	3.445.000	6.264
Various materials (reagents and laboratory materials)	Lump sum	1.890.000	1	1.890.000	3.436
Vibrocultivator	Unit	4.442.200	4	17.768.800	32.307
Video camera with tripod	Unit	412.800	2	825.600	1.501
Water filter	Unit	57.328	567	32.505.000	59.100
Water prospecting service	Unit	2.500.000	1	2.500.000	4.545
Water purifier	Unit	1.280.000	9	11.520.000	20.945
Water treatment equipment	Unit	4.874.000	9	43.866.000	79.756
Watering pumps 0.25 HP	Unit	36.460	100	3.646.000	6.629
Watering pumps 0.5 HP	Unit	64.500	567	36.571.500	66.494
Wheat and quinoa seeder	Unit	4.380.000	1	4.380.000	7.964
Wood for signs for demonstration units, nails, and other	Lump sum	280.000	16	4.480.000	8.145

Budget on the Implementing Entity management fee use

Fee Use	**TOTAL**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Project monitoring and financial management	$ 400.000	$ 83.516	$ 114.286	$ 114.286	$ 87.912
Field visits for the technical monitoring of the project	$ 10.500	$ 2.184	$ 2.940	$ 2.940	$ 2.436
Equipment (PC, tablet, printer)	$ 11.000	$ 11.000			
Running costs (telephone, internet, desk materials, others)	$ 13.500	$ 3.375	$ 3.375	$ 3.375	$ 3.375
Financial Auditing	$ 65.000		$ 15.000	$ 20.000	$ 30.000
Total	**$ 500.000**	**$ 100.075**	**$ 135.601**	**$ 140.601**	**$ 123.723**

ADAPTATION FUND NIE BUDGET (AGCI)		
Items	**Description**	**Total Cost USD$**
2 professionals responsible for follow up, monitoring, and developing technical reports.	• 2 professionals hired for a period of 40 months each. • Monthly rate: USD$ 3,680.00	USD$ 294,400.00
1 financial specialist responsible for reviewing accounts rendered and accounting, as well as developing financial statements.	• 1 specialist hired for a period of 48 months. • Monthly rate: USD$2.200	USD$ 105,600.00
3 personal computers, 1 printer, 3 tablets.		USD$ 11,000.00
Work materials: cellular phone plan, desk items, printer ink, among others.		USD$ 13,500.00
Field visit travel costs for project monitoring and follow up.	Travel tickets and per diem.	USD$ 10,500.00
Auditing services of the project's financial statements.		USD$ 65,000.00
TOTAL COST		**USD$ 500,000.00**

H. Include a disbursement schedule with time-bound milestones.

DISBURSEMENT SCHEDULE (USD)

Concept	TOTAL	Year 1	Year 2	Year 3	Year 4
INTERNATIONAL CONSULTANTS	**57.273**	-	27.273	-	30.000
NATIONAL CONSULTANTS	**2.782.324**	605.327	785.410	801.216	590.370
TRAVEL	**267.612**	44.602	89.204	89.204	44.602
EQUIPMENT	**4.053.808**	512.602	2.337.082	859.043	345.082
CONTRACTS	**1.016.578**	485.609	198.692	243.249	89.029
GOODS AND MATERIALS	**1.073.946**	124.228	334.247	408.490	206.981
TRAINING	**208.459**	37.531	61.402	63.441	46.084
TOTAL PROJECT COST	**9.460.000**	**1.809.899**	**3.833.310**	**2.464.643**	**1.352.148**
NIE FEE	**500.000**	**100.075**	**135.601**	**140.601**	**123.723**
TOTAL	**9.960.000**	**1.909.974**	**3.968.911**	**2.605.244**	**1.475.871**
Disbursement Date		**Presentation of AOP Est. January 2016**	**Presentation of AOP Est. January 2017**	**Presentation of AOP Est. January 2018**	**Presentation of AOP Est. January 2019**

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[6] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional projectlprogramme, list the endorsing officials al/ the participating countries. The endorsement letter(s) should be attached as an annex to the projectlprogramme propasal/. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional projectlprogramme:*

Gladys Santis Adaptation Officer Ministry of Environment	Date: *August 3rd, 2015*

B. Implementing Entity certification *Provide the name and signature of the lmplementing Entity Coordinator and the date of signature. Provide also the projectlprogramme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans ("National Action Plan on Climate Change"; “National Adaptation Plan on Climate Change” and "Climate Change Adaptation Plan for Forestry and Agriculture") and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

Ricardo Herrera Saldías
Executive Director
AGCI
Implementing Entity Coordinator

Date: August 3rd, 2015
Tel. and email:+56 (2) 28275756 eofarrill@agci.gob.cl

Project Contact Person: Enrique O'Farrill-Julien, Head of the Bilateral and Multilateral Cooperation Department Tel. And Email:
+56 (2) 28275756 eofarrill@agci.gob.cl

e. Each Party shall designate and communicate to the secretaria!the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

ANNEX 1

PARTICIPATORY PROCESS

Project: "Enhancing Resilience to Climate Change of the Small Agriculture in the Chilean Region of O'Higgins (Chile)"

Implementing Agency: CHILEAN INTERNATIONAL COOPERATION AGENCY (AGCI)
Executing Agencies: MINISTRIES OF AGRICULTURE AND ENVIRONMENT

2015

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1. PRESENTATION

This report covers the participatory process that was developed in the framework of the project "**Enhancing Resilience to Climate Change of the Small Agriculture in the Chilean Region of O'Higgins (Chile)"** in the communes of Litueche, Lolol, Paredones, Pumanque, Marchigue, La Estrella, Navidad and Pichilemu. The Agriculture and the Environment Ministries will be executing the project, incorporating representatives of INIA, UNEA, and INDAP in an executive committee and as such giving the project implementation political and technical sustainability.

The objective of this project is to enhance the resilience of rural agricultural communities in the O'Higgins region's coastal *secano* in the face of current climate variability and future climate change. This objective is operationalised through two components, the expected results of which are associated. These components are:

Component 1: Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock.
The expected results are: Capacities for managing soil, livestock, water and crops increased, Access to machinery for soil management, and Water availability and increased productivity in 550 plots.

Component 2: I Installation of an information system for agro-climatic risk management and climate change adaptation.
The expected results are: Improved capacity of MINAGRI staff in the O Higgins region in agro-climatic risk management, Improved adaptive capacity to climate change of the farmer communities in the O Higgins region through the use of agro-climatic information, Increased agricultural production through "climate clever" decision making, and This component will serve as a model for other regions.

This participatory process seeks to incorporate key stakeholders and small farmer project beneficiaries and as such create sustainability in the expected results.

2. OBJECTIVES

2.1. Overall Objective

The overall objective is to generate a participatory process incorporating the key players in *secano* agriculture, and those small farmers who will be project beneficiaries in the communes of Lolol, Paredones, Pumanque, Litueche, Marchigue, Pichilemu, La Estrella and Navidad in the O'Higgins Region.

2.2. Specific Objectives

1. Understand the disposition towards the project and the proposed solutions of the farmers who will be the direct beneficiaries.
2. Ascertain the problems of small farmers in the Secano from stakeholders at community level.
3. Incorporate the views or proposals of small farmers with respect to the solutions proposed in the Climate Adaptation Fund project where technically and economically feasible.

3. METHODOLOGY

In the framework of project "Enhancing Resilience to Climate Change of the Small Agriculture in the Chilean Region of O'Higgins(Chile)" and in order to identify and prioritise a set of relevant social actors or stakeholders in that region, and specifically from the participating communes, a general participatory type methodology based on gathering qualitative and quantitative information was implemented.

3.1. Stakeholder Interviews

First, information was gathered from primary sources, carrying out a total of 6 interviews with interviewees selected bearing in mind that the PRODESAL officials (INDAP's Local Development Programme) are those with the closest relationship to the small farmers.

The areas of action of the key interviewees - that is, the territorial scope of the work carried out by the institution they represent - correspond primarily to the commune level, and in one case to the area, i.e. three communes.

Table 1: List of Key Interviewees

Commune	Name	Position
Litueche	Mr. Daniel Bascuñán	Area manager
Marchigue	Mr. Gustavo Jorquera	Professional
Pichilemu	Mr. Rodrigo Clavijo	Professional
Paredones	Mr. Sebastián González	Professional
Pumanque	Mr. Rodrigo Valenzuela	Professional
Navidad	Mr. Juan Francisco Rubio	Professional

3.2. Workshops

To respond to objectives 1 and 3, we approached the main project beneficiaries, ie small farmers, through three workshops in the districts of Litueche, Marchigüe and Pichilemu with about 170 people attending.

Table 2: Participatory Workshops

Commune	Date	Time	Place	Participants
Litueche	May 28, 2015	10:00 - 12:00	Litueche Church	50 people
Marchigue	May 27, 2015	15:00 - 17:00	Rafael Casanova Community Centre	50 people
Pichilemu	May 27, 2015	10:00 - 11.30	Prodesal Centre	70 people

The workshops had three modules; the first involved a power point presentation on the general background of the project; the second, receiving comments, questions or input regarding what had been presented; and finally, getting the small farmers who want to be project beneficiaries to answer a survey. These three workshops were designed to be informative and consultative with potential beneficiaries of the aforementioned communes.

3.3. Questionnaire

In terms of methodology, a questionnaire was designed and applied to the target population, which will provide us with a delimited profile, which will in turn help us with a more appropriate implementation of the project.

To collect information that allows us to familiarise ourselves with, describe and evaluate the current situation of farmers, giving personal interviews in areas where the development of irrigation canals is planned, through a semi-structured questionnaire, was envisaged. In terms of methodology, a survey to characterise the target population was designed and applied.

Assessment Tool: The instrument for measuring was a semi-structured questionnaire with open and closed questions that allows for exploring, identifying and characterising issues of interest to the farmer.

Target Group: Those older men and women who work in agriculture in the provinces of Cardenal Caro and Colchagua.

Coding, Data Validation and Database Building: Having reviewed the survey, the open questions were codified and entered alphanumerically into programmes (Epidata) specially designed for entering the information contained in the surveys.

To validate cases entered, two information validation mechanisms were used; the first associated with the correct design of programmes for data entry where question skip control mechanisms were established *a priori*, and the second was developed at the data processing stage, for which SPSS 18.0 Statistical Processing Software was used and an error checking and database validation process performed through variable cross tabulation. Some inconsistencies (outlayers, failure to skip etc.) were picked up and these were compared with their original source (the surveys) and corrected prior to the final processing of the information.

Some of the aspects considered in the validation of the information entered in the final data are:

- Correct application of question skips
- Question response ranges allowed
- Correct assignment of codes
- Verification of data entry by question type (multiple choice, single answer, response categories)
- Creation of new information variables due to response recodings or building indicators
- Once the database was validated, statistical processing was conducted, the results of which are contained in this report.

The above was coordinated through:

- Technical Coordination Board on April 9 of this year at the premises of INIA Rancagua, with the presence of representatives from the agriculture SEREMI, VI Region; ODEPA; the Ministry of the Environment, INDAP, UNEA and INIA, where the development of this participatory process was first approached. This board has national and regional representation and as such it was considered necessary to create a forum where local stakeholders could participate.
- A local level meeting was held on April 20, 2015, at the Community Centre in the Commune of Marchigue with the participation of PRODESAL teams from the 8 communes involved in the project. A representative from the VI Region Ministry of Agriculture and a representative from INDAP Regional presented the project, placing emphasis on how to carry out the participatory process. This initial meeting was fundamental for the involvement of the PRODESAL teams in the whole process, as they positively evaluated the benefits of implementing the project and convened the workshops and supplied questionnaires to those small farmers likely to be beneficiaries.

4. FINDINGS AND RESULTS OF THE PARTICIPATORY PROCESS

4.1. Interviews of PRODESAL supervisors

Officials from the INDAP Local Development Programme communes of the communes involved in the project have been key players in this process. They have a direct link through their daily work, supporting, training and strengthening the work of small farmers, becoming a significant and valued player at community level.

We approached them with 5 questions which would furnish us with general information about their perception of the direct beneficiaries of this project and their socioeconomic and cultural situation and allow us to validate that the contents of the project were appropriate for the existing problems. The main elements are listed below:

1.- What are the main socio-economic and cultural characteristics of the farmers in his commune?

1	Users are mainly subsistence farmers who sell little surplus.
2	They are very conservative in terms of their productive and social systems, regarding their economic activities as a way of life.
3	All agricultural activities are dependent on the rains.
4	Smallholdings produce beans, potatoes, quinoa and vegetables such as lettuce, tomatoes, strawberries.
5	Elderly users, ie over 45 years
6	Low education levels prevail and even illiteracy, especially in the elderly.
7	Possession of sheep, beekeeping, small-scale stables.

2.- What are the main problems of agriculture in the coastal *secano* area?

1	Watering and degraded soils. Limited soil fertility.
2	Relief - hills and ravines - leaving little room for conventional or technical agriculture.
3	Livestock farming not supported by the "pillars" of animal production (genetics, health, nutrition, reproduction and handling) leaving this to be determined by "good and bad years."
4	Water scarcity due to 4-year drought where rainfall has been less than 50% of normal.
5	Water jurisdiction. There are sources of water that accrue after rains and feed rivers, in this case they are feeder branches of the River Nilahue and the Nuevo Reino ravine. As branches they cannot be registered by DGA, which is a major constraint as the branches pass through private land, much of which belongs to small farmers who, without the rights to use the water are not eligible for projects to facilitate the incorporation of technology in their fields.

3.- How have farmers confronted these problems?

1	Few farmers actually tackle these conditions effectively, but rather make a kind of crop rotation and fertilize land primarily with urea, as well as seeking to accumulate water.
2	To resolve the issue of incorporating technology or acquiring irrigation machinery, personal outlays are made which means a decrease in income that could be used to invest in infrastructure or spent on their families.
3	State funds exist to help solve the problem of low soil fertility through benefits or incentives, which is given a name that recognises that everything is always too little.
4	In terms of the problem of irrigation, Art. 56 of the Irrigation Act states that water use is a right in subsistence conditions, which limits the level of capital they can ask for.
5	With crops that require little water such as beans, peas, beans, chickpeas and mostly sheep farming.
6	With the principal support of INDAP and strong promotional measures and state grants for, for example, planting additional grasslands, dry forage, for investments in infrastructure, corrals, warehouses, animal genetics, conservation support and the search for water (drilling wells), tanks, ponds, and some mini reservoirs.

4.- What do you think would be the best way to address this problem?

1	Mechanise systems to adapt to the lack of water and invest in resources to recover degraded soils.
2	State support in terms of works focusing on everything related to water resources, which at budget level should be considered an investment for public use and not competitive funds.
3	Tools and projects to address water issues, albeit on a small-scale (harvesters, mini reservoirs, shallow drilling and well drilling (30-40 m depth) in order to have water to produce a few more vegetables, to lengthen the growing season a little or to water animals.

5.- Based on the information you have, do you think that the Adaptation Fund project can help with the problems in the coastal *secano* area?

1	It includes actions to inform small famers and provide them with tools that will give them guidelines to address water scarcity and restore degraded soils.
2	Highly positive to introduce the subject of the environment, water deficit, in order to create awareness amongst programme users.
3	It can contribute as it is framed within the current support measures of INDAP, INIA and others.

4.2. Workshops

Three participatory workshops were held in the communes of Litueche, Marchigue and Pichilemu. They were coordinated at community level with the PRODESAL teams in charge of the sessions. The project was introduced to attendees through a Power Point presentation and at the end they were invited to be beneficiaries of the project and asked to fill in the questionnaire and sign acceptance of the conditions for project beneficiaries.

1. Litueche:

Main considerations:

- PRODESAL has worked for several years in conjunction with INIA who have installed a significant number of Rainwater Harvesting Systems with greenhouses in the commune. This project would help to cover the remaining population.
- Beneficiaries of SAG were called to attend at commune level. They are interested in benefiting from rainwater harvesting systems with greenhouse to grow animal fodder.

2. Marchigue:

Main considerations:

- Possibility of implementing Small Reservoirs within the plan, depending on the needs of the fields.
- The rainwater harvesting system and the greenhouses will principally be for subsistence crops.
- They are well disposed to the project.

3. Pichilemu:

Main considerations:

- There is great interest from farmers to be beneficiaries of the project as in the commune there has not been any investment in a rainwater harvesting system and it is seen as helping with the problems associated with irrigation.

4.3. Beneficiaries Questionnaire

1. Participants

We have 558 people recorded as being interested in being beneficiaries of the project.

Table 3: Beneficiarios by commune

Comuna	N
Pichilemu	120
Lolol	79
Paredones	72
La estrella	70
Pumanque	70
Marchigüe	64
Navidad	42
Litueche	34
Peralillo	2
Total	553

Table 4: Number of beneficiaries by province

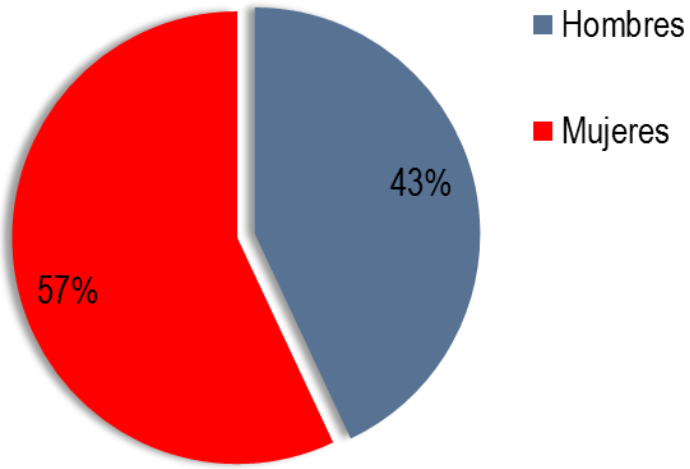
Provincia	N
Cardenal Caro	405
Colchagua	148
Total	553

Source: Based on the questionnaire

2. Profile of beneficiaries

As per the plan, positive discrimination was used in favour of women, and as such there are 57% female and 43% male beneficiaries.

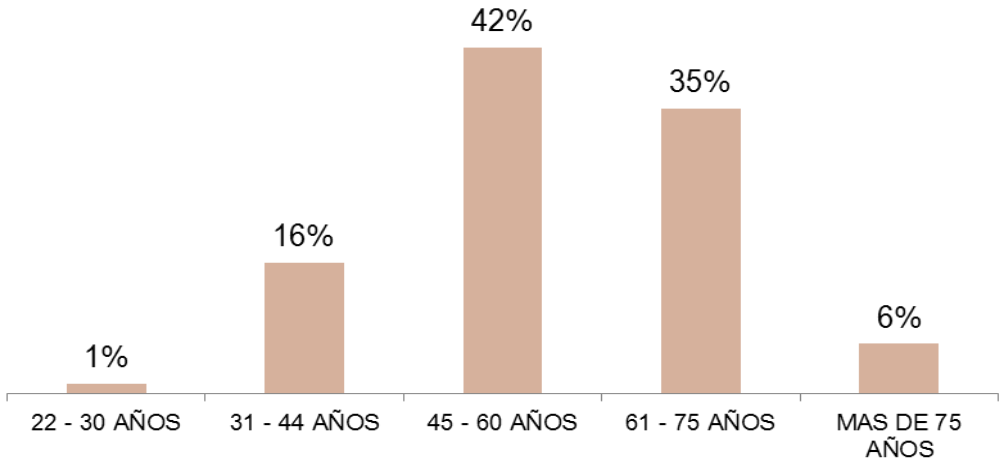
Graph 1: Gender of beneficiaries



Source: Based on questionnaire

Although the aim is to reach young people, the reality is that small farmers are mostly older people, 83% of them older than 45.

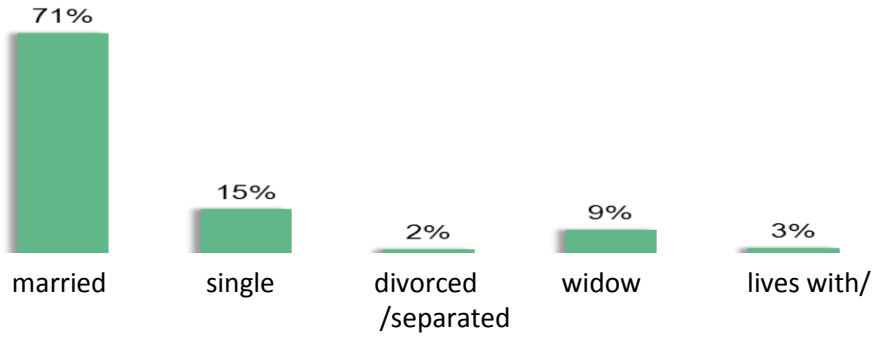
Graph 2: Age groups



Source: based on questionnaire

Marital status corresponds to the traditional characteristics of the project participants. Most are married (71%).

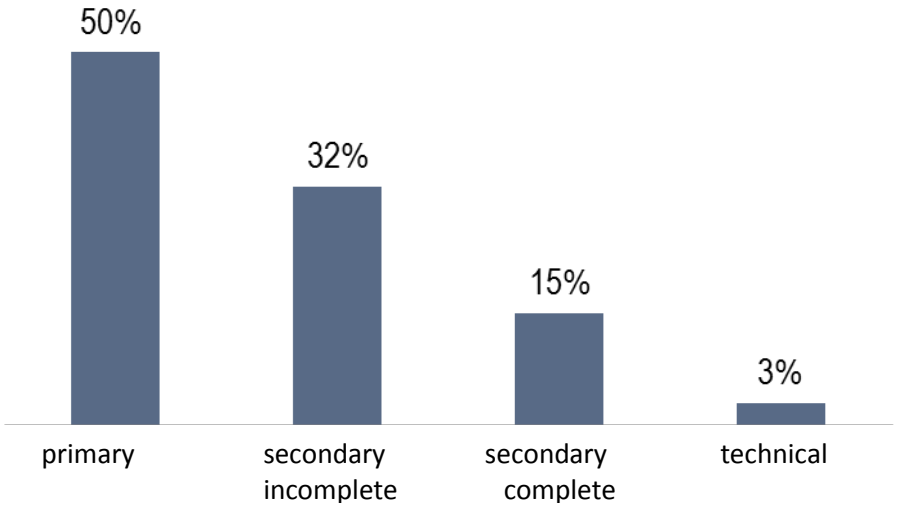
Graph 3: Marital status of beneficiaries



Source: based on questionnaire

The education variable is a major factor in the development of the project as we have a population where most beneficiaries do not possess even minimum literacy abilities of reading and writing. 82% has not completed mandatory education.

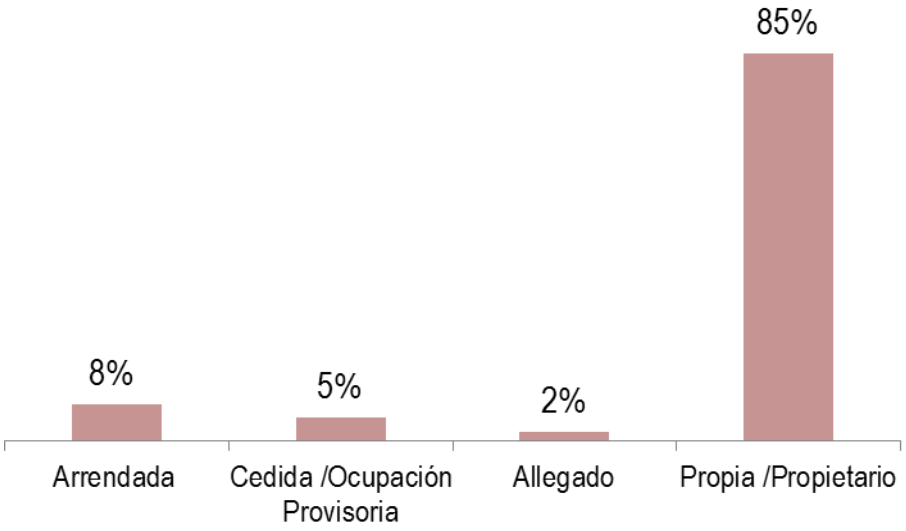
Graph 4: Beneficiaries' Educational Level



Source: based on questionnaire

One of the issues addressed at the technical round tables was to prioritise beneficiaries who were owners in order to make the investment more sustainable, both for this project and for the work that can be done on the issue of adaptation to the climate fund. 85% declare to own the home where they live.

Graph 5: Home ownership of beneficiaries

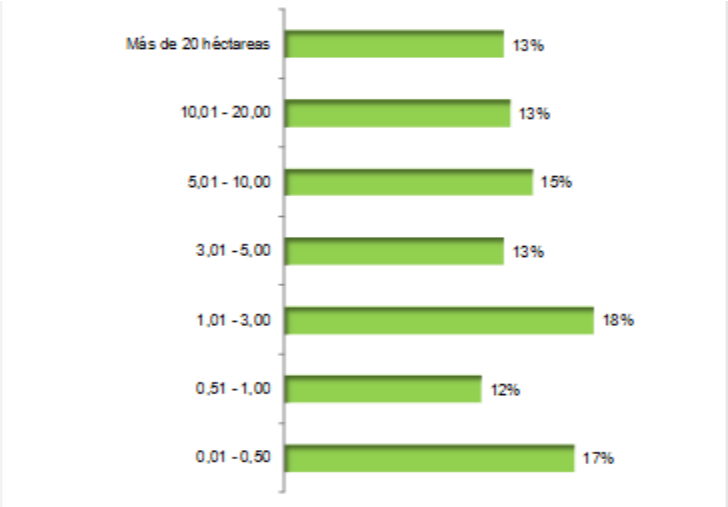


Source: based on questionnaire

3. Ownership and use of land

Sixty per cent of beneficiaries have less than five hectares whilst a significant 29% has less than one hectare.

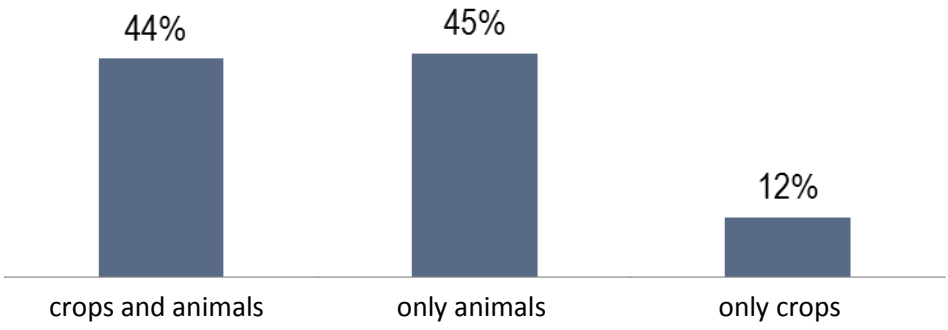
Graph 6: % ownership of hectares of land (ranges)



Source: based on questionnaire

We asked beneficiaries how those hectares are used (515 people replied). While 44% declare mixed use for agriculture and animal husbandry, 45% devotes land to animal husbandry only and 12% works on agriculture only.

Graph 7: Use of land



Source: based on questionnaire

Regarding how many hectares are used for crops, we have an average of 1,06 hectares. Litueche is the commune with the most land used for arable farming with more than 2 hectares.

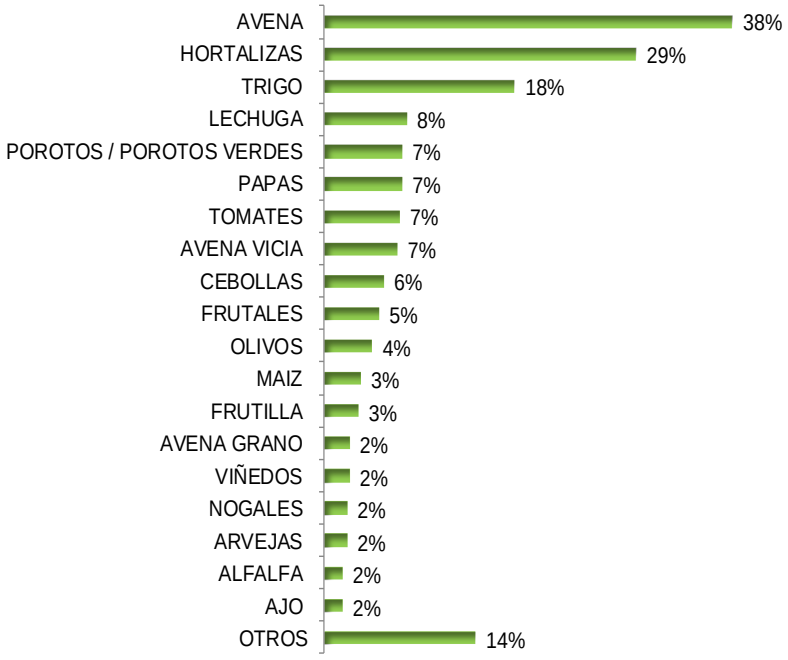
Table 5: Average hectares used for agriculture by commune

	Promedio
TOTAL	1,06
PAREDONES	1,06
PUMANQUE	0,62
LA ESTRELLA	1,33
PICHILEMU	0,64
NAVIDAD	0,94
MARCHIGÜE	1,31
LITUECHE	2,44
LOLOL	1,42
PERALILLO	1,35

Source: based on questionnaire

Of the 417 people that answered regarding what they grow, 38% grow oats, 29% dairy vegetables and 18% wheat. Other crops (lettuce, beans/green beans, potatoes, tomatoes, vetch, onions, fruit trees, olives, maize, strawberries, grain oats, vines, walnuts, peas, alfalfa, garlic, other) occur less frequently.

Graph 8: Percentages of crops grown



Source: based on questionnaire

Regarding animal husbandry, most of those surveyed have sheep (71.4% of respondents with animals, mean 24 animals), horses (42%) and poultry (about 44%). Cows, alpacas, goats and bees are also held.

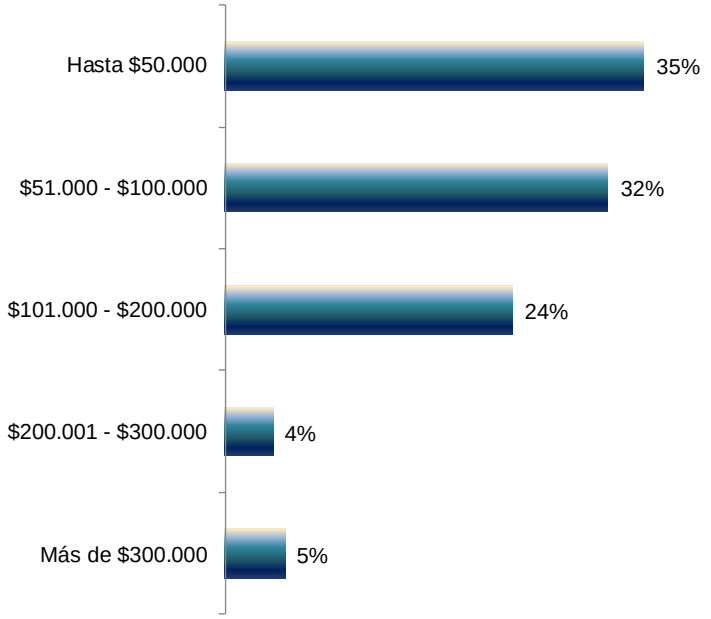
Table 6: % ownership of animals and average no.

	Tasa Tenencia Casos con Animales	Promedio
OVEJAS	71,4%	24,4
VACAS	28,2%	5,3
CABALLOS	42,1%	2,5
AVES DE CORRAL	43,6%	30,4
ALPACA	0,9%	3,2
CABRAS	11,1%	31,4
ABEJAS	5,6%	35,6

Source: based on questionnaire

Regarding: "What is your monthly income for work associated with land use?" 67% receive up to 100 000 pesos. In the cases of earnings of more than 300 000 pesos, corresponding to 5%, some reported receiving that amount or more just once a year, mainly from the sale of animals in the summer months.

Graph 9: Percentage of income according to range ($CLP)

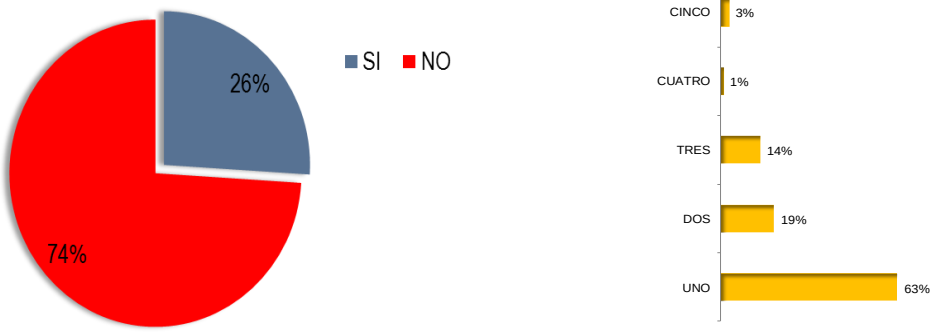


Source: based on questionnaire

4. Irrigation and agriculture

Regarding water rights, only 26% reported having rights and of these 63% have just one right.

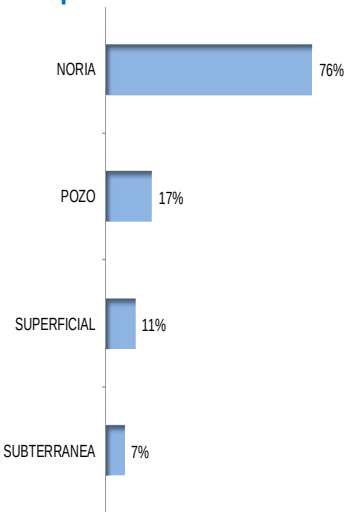
Graph 10: Acredited Water Rights **Graph 11: Assigned Water Rights**



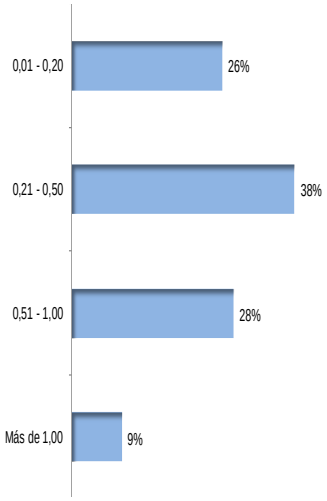
Source: based on questionnaire

Water Extraction: The situation regarding the use of water is very precarious, which means that few people are able to answer questions associated with this item (only 194 people answered). Hand-dug wells are mostly used (76% of respondents), with drilled-well, superficial and underground sources lagging behind. Only 9% of respondents dispose of flows of 1 litre per second or more.

Graph 11: Water sources



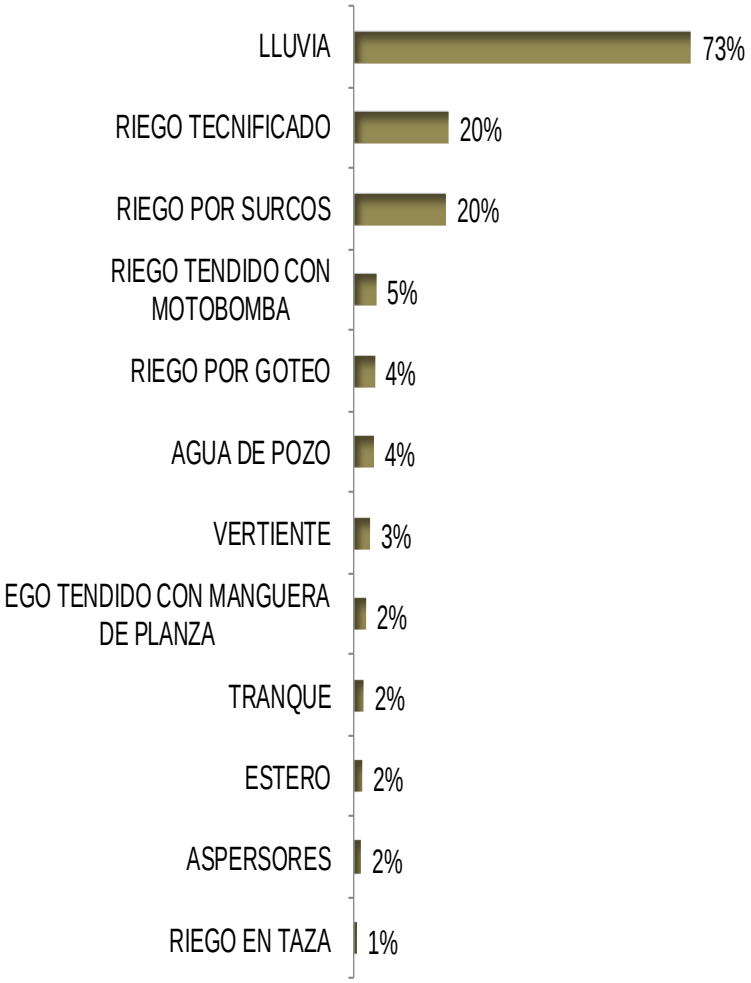
Graph 12: Flow rate



Source: based on questionnaire

Regarding forms of irrigation used, as might be expected in a *secano* area, 73% depend on rain. Multiple responses were allowed and after rain came mechanised watering and then furrow irrigation. Other options (overhead irrigation with motor pump, drip, well water, watershed, hose irrigation, reservoir, stream, sprinklers, individual basin) scored much lower.

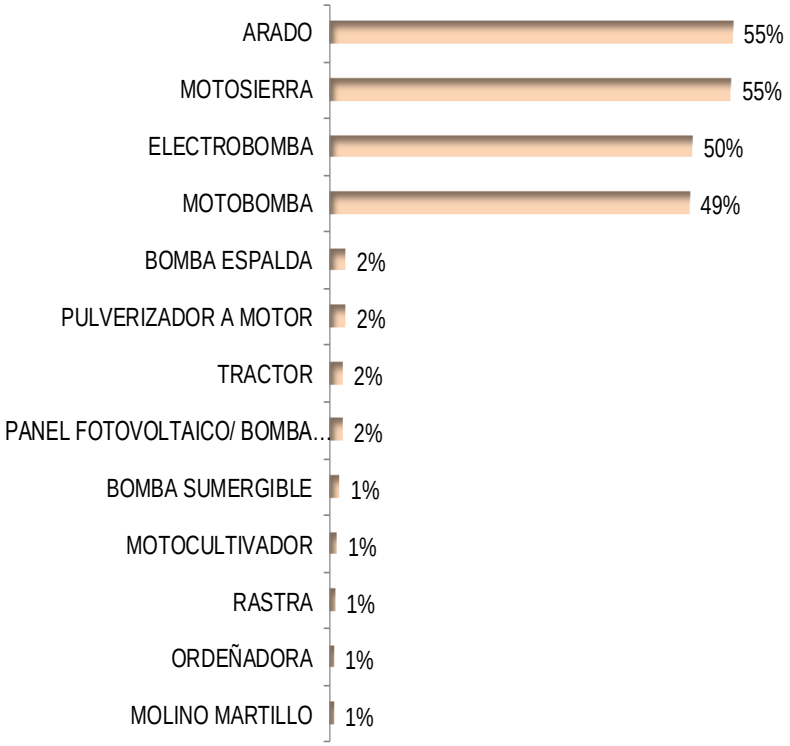
Graph 13: Forms of Irrigation Used (N=524)



Source: based on questionnaire

Regarding machinery used for agricultural work – basic items for farming – we found it is low tech. While plough (55%), chainsaw (55%), electric pump (50%) and motor pump (49%) were common, other items (back pump, motor sprayer, tractor, solar panels/pump, submergible pump, power cultivator, harrow, milker, hammer mill) were rare.

Graph 14: Machinery used for farming work (N=492)

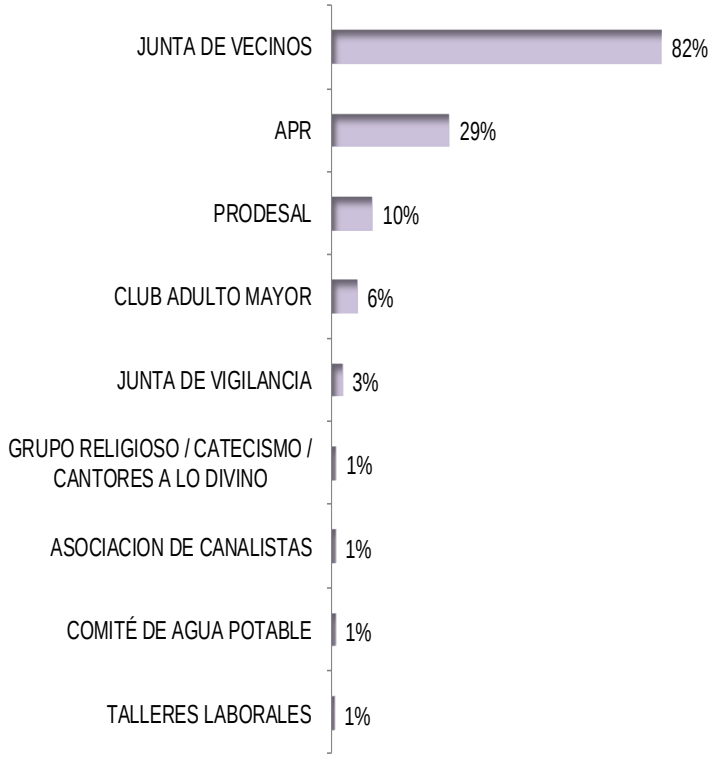


Source: based on questionnaire

5. Participation and Media

Problems of rural living include connectivity and communication and to develop the project we needed to find a source of social participation that was familiar and could also be a communication channel. A total of 401 people answered regarding the organisations they were linked to. Neighbourhood Committees were by far the most common (82%), while APR (Rural Drinking Water Programme) groups, PRODESAL groups, clubs for the elderly, neighbourhood watch groups, religious group/catechism/choir, Canal Associations, other drinking water committees and labour workshops were much less frequently mentioned.

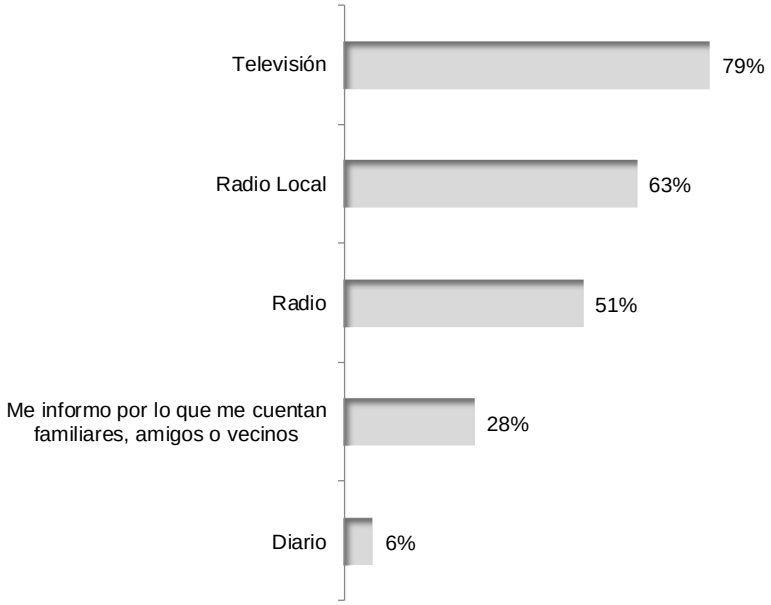
Graph 15: Community Participation



Source: based on questionnaire

Regarding media, 522 people responded, who mostly get their information from radio and television.

Graph 16: Media

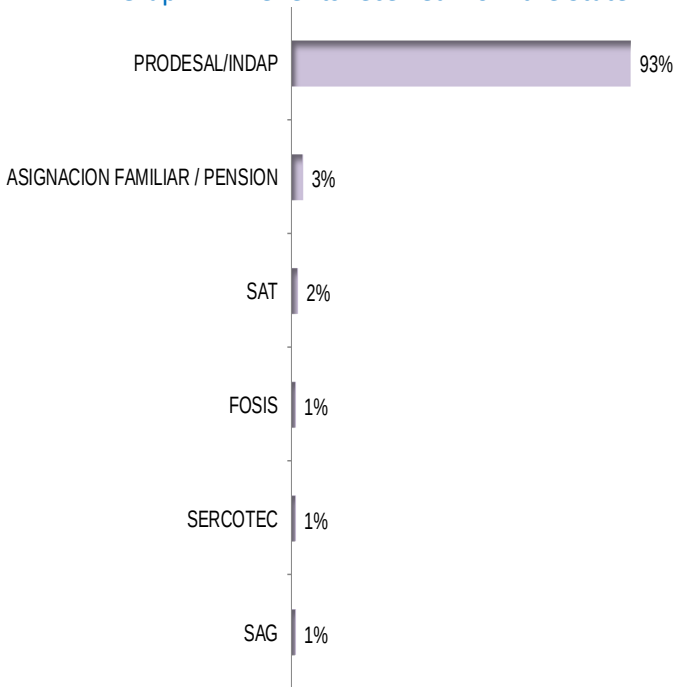


Source: based on questionnaire

6. State Benefits

Regarding receiving state benefits, 483 people replied. 93% have only received PRODESAL support.

Graph 17: Benefits received from the State



Source: based on questionnaire

5. CONCLUSIONS

Bearing in mind the information collected in the questionnaires and the information provided by the PRODESAL teams, we have background that allows us to begin building a profile of the beneficiaries, specifically the variables of age, education, income, and rurality, and we can affirm that the beneficiaries are people of high social vulnerability, this condition being increased by the poor connectivity and access to urban services.

One determining variable is the level of schooling. The low level of education of the beneficiaries represents a disadvantage when engaging with entities and institutions, affecting mainly communication, understanding and analysis, due to the fact that cognitive tasks afforded by primary education have not been fully developed, such as the effective process of literacy; ability to carry out mathematical operations involving application of patterns; concentration and logic.

Add to this the instability of the sources of labour which in effective terms are reduced to agricultural work and generate low incomes that do not constitute sources of overcoming poverty.

Por lo cual, las problemáticas asociadas al agua, solo vienen a acrecentar las ya existentes. Si observamos los datos entregados sobre el uso de tierra y agua, podemos dilucidar un manejo precario y deficiente.

Problems associated with water just enhance existing difficulties. Looking at the data provided on the use of land and water reveals precarious and poor management.
This observation is corroborated by PRODESAL who see the problems not only as being related to the shortage of water, lack of rain, but also to poor management of water and land, the lack of mechanisation and depleted subsistence farming where elderly people try to preserve their land while the young have migrated to the cities.

6. RECOMMENDATIONS

1. Due to the above it becomes a priority to consider a high level of support, because this is not just about delivering a benefit, but also creating conditions for the sustainability of the investment, and for this it is necessary to work in situations of a subjective nature, and emotional. According to our observations it is the PRODESAL teams that are the key social actors for fostering and furnishing beneficiaries with competences and as such it should be that way a programme should address them.
2. Along with the process of delivering a benefit, and what the demonstration plots may foster in terms of expectations, there should be a regional and local institutional network coordinated and prepared to receive any new demands that these processes may generate. This way not only are issues related to a lack of water mitigated, but its proper use, and that of the land, are promoted.
3. Due to the foregoing analysis it is important to note that because of the precarious socio-economic characteristics of the beneficiaries, it may be that delivery of the benefit is not enough to address the problem.
4. Lastly, the value of the experience of the beneficiaries was considered and the contribution they might make with their traditional ways, bringing about a cultural rescue of the small farmer in the *secano* area, writing down and telling their story before the changes are made so it can be remembered. Endowing the story with importance in this way may foster for a more respectful attitude towards doing things differently.

LIST OF STAKEHOLDERS ALREADY CONSULTED

ID	NAME	IDENTIFICATION	ADDRESS	LOCALIZATION	PHONE
1	JOVINA DEL ROSARIO GUERRA PEÑALOZA	7926492-0		PAREDONES	87994502
2	EDELMIRA ISOLINA DEL CARMEN RAMIREZ MUÑOZ	8176633-9	CABECERAS S/N	PAREDONES	95802133
3	CARLOS PATRICIO DIAZ LOPEZ	8897017-9	EL CARDAL S/N	PAREDONES	94454487
4	MARIA ISABEL CABELLO ORTIZ	7555232-7	PINALNAGO S/N	PAREDONES	94615661
5	ROSARIO YAQUELINA DEL CARMEN MAYOR DUARTE	9502020-8	LA LIGUA S/N	PAREDONES	68079000
6	RICARDO ANTONIO PEREZ PIÑA	7226118-6	EL QUILLAY S/N	PAREDONES	99038961
7	GALINDO MANUEL PARRAGUEZ ESCOBAR	7459705-3	EL QUILLAY S/N	PAREDONES	96336111
8	CRISTINA DEL CARMEN CORNEJO DEL PINO	5372784-0	LAS VIÑAS S/N	PAREDONES	
9	MANUEL BENEDICTO REYES ARAYA	9073971-9	PENILANGO S/N	PAREDONES	74969102
10	FROILAM ENRIQUE GONZALEZ GONZALEZ	6838679-9	EL PERAL S/N	PAREDONES	91471124
11	MANUEL HERNAN VALNZUELA MARIN	10189963-2	PENILANGO S/N	PAREDONES	97517220

12	MANUEL BENITO PONTIGO BUSTOS	4240944-8	PENILANGO S/N	PAREDONES	89890666
13	OSCAR MANUEL CORNEJO CORNEJO	5580311-7	QUERELEMA S/N	PAREDONES	
14	JOSE RAMON CABELLO ORTIZ	7374285-4	PANILONGO S/N	PAREDONES	96467100
15	MANUEL ENRIQUE PEREZ PEREZ	7392902-4	CABECERA S/N	PAREDONES	919922137
16	MANUELA DEL CARMNE ORELLANA	8107146-2	EL QUILLAY S/N	PAREDONES	93255477
17	DOMINGO IGNACIO REYES FREDES	7455969-7	EL QUILLAY S/N	PAREDONES	93255477
18	MAURICIA DEL CARMEN POZO	4880496-9	EL QUILLAY S/N	PAREDONES	93255477
19	OSCAR ARMANDO SOLIS DIAZ	4494925-3	QUERETEMA S/N	PAREDONES	91669327
20	FLAVIO ANTONIO CORNEJO CORNEJO	5426285-0	LA LIGUA S/N	PAREDONES	92641282
21	ANDRES RODRIGO CISTERNA AHUMADA	10434027-0	EL CORDAL S/N	PAREDONES	81687183
22	CAYETANO DEL CARMEN GOICOCHEA VALENZUELA	6305345-7	EL CORDAL S/N	PAREDONES	85228116
23	HECTOR SANTIAGO CASTRO GUERRA	10128959-1	LA QUESERIA S/N	PAREDONES	97275758
24	ROBERTO ANIBAL JIMENEZ PULGAR	5230795-3	EL CORDAL S/N	PAREDONES	97245897
25	BERNARDINO MODESTO PASTENE PASTENE	3719104-3	LO VALDIVIA S/N	PAREDONES	91947727
26	LUIS GILBERTO ORDENES PASTENE	3396767-5	LA POBLACION S/N	PAREDONES	85719173
27	MARIA GLORIA CACERES LEON	10544994-1	LA POBLACION S/N	PAREDONES	76251905
28	ORLANDO ANTONIO VALENZUELA PEREZ	5491158-0	LO VALDIVIA S/N	PAREDONES	94014130
29	GUILLERMO DEL CARMEN CORNEJO POZO	4146963-3	EL CARDAL S/N	PAREDONES	97253616
30	GUILLERMINA DEL CARMEN PEREZ AHUMADA	8649760-3	EL CARNAL S/N	PAREDONES	94685969
31	BERNARDO ANTONIO VENEGAS GONZALEZ	6846122-7	EL PERAL S/N	PAREDONES	90237331
32	JULIA ROSA PONTIGO BUSTOS	6395686-4	PENILANGO S/N	PAREDONES	68147939
33	ANTUCA DEL CARMEN RIVERA SANTELICES	7095560-1	LO VALDIVIA S/N	PAREDONES	77362957
34	MARIO IGNACIO GUTIERREZ MACHUCA	6571002-1	LA QUESERIA S/N	PAREDONES	92680948
35	MANUEL ANTONIO ROJAS ARAYA	6183445-1	EL CARDAL S/N	PAREDONES	99021639
36	ISAIAS HERNAN VALENZUELA ALVAREZ	5556265-5	LO VALDIVIA S/N	PAREDONES	96441330
37	GABRIEL GUSTAVO TORO CABELLO	6183927-5	CABECEROS S/N	PAREDONES	
38	MARIA ELISA CASTRO GUERRA	11995720-6	LA QUESERIA S/N	PAREDONES	95447612

39	PEDRO ANTONIO MARIN	4074832-6	PENTILANGO S/N	PAREDONES	99626932
40	RAQUEL DEL CARMEN GONZALEZ ROSSEL	7376777-6	EL QUILLAY S/N	PAREDONES	77274665
41	JAIME ORLANDO CORNEJO	3941912-2	LA LIGUA S/N	PAREDONES	68079000
42	MARIA RAQUEL CORNEJO MAYOR	13209885-9	EL CARDAL S/N	PAREDONES	53216044
43	MARIA LILA GALARCE MARAMBIO	3701677-2	QUERELEMA S/N	PAREDONES	
44	OSVALDO ANTONIO BARROS CACERES	7249069-0	cutemu s/n	PAREDONES	97200244
45	OSVALDO FELIPE GONZLEZ LABARCA	9061605-6	LA QUESERIA S/N	PAREDONES	
46	JAIME ORLANDO VALENZUELA VALENZUELA	10271082-7	LO VALDIVIA S/N	PAREDONES	
47	VICTOR OSVALDO CAÑETE MUÑOZ	8845513-4	CUTEMU S/N	PAREDONES	
48	JOSE TORIBIO FUENZALIDA CASTRO	4218371-7	EL PERAL S/N	PAREDONES	
49	MANUEL JARA MARTINEZ CACERES	7354943-4	CUTEMU S/N	PAREDONES	
50	NORFA MILENA LOPEZ VALENZUELA	13370443-4	EL PERAL S/N	PAREDONES	
51	GUILLERMO ANDRES CORNEJO CORNEJO	13571005-9	EL CALVARIO S/N	PAREDONES	
52	GLADYS MYRIAM CACERES DIAZ	11556834-5	CARRIZALILLO S/N	PAREDONES	
53	WILSON JESUS VALENZUELA TOLEDO	7990174-1	CARRIZALILLO S/N	PAREDONES	
54	DOMINGO IGNACIO GUERRA BRIONES	6100740-7	QDA LOS BRIONES S/N	PAREDONES	
55	MARIA DEL CARMEN REYES VENEGAS	5100660-7	CUTEMU S/N	PAREDONES	
56	CECILIA GUZMAN ACEVEDO	9388526-0	QDA LOS BRIONES	PAREDONES	
57	EDUARDO RAFAEL CANALES MALENDEZ	10586069-2	CARRIZALILLO S/N	PAREDONES	
58	ANGEL ALEJO AHUMADA PASTENE	11760971-5	LO VALDIVIA S/N	PAREDONES	
59	GALVARINO JESUS CACERES CANALES	9758729-9	LAS PAPAS S/N	PAREDONES	85333100
60	RAUL SGUNDO BARROS CACERES	7249069-0	CUTEMU S/N	PAREDONES	
61	OLGA DE LAS MERCEDES MUÑOZZ CANALES	10930863-3	CARRIZALILLO	PAREDONES	
62	OSCAR JESUS CACERES LOPEZ	8554344-0	CARRIZARILLO	PAREDONES	
63	PEDRO TITO POBLETE POBLETE	6136638-6	CUTEMU S/N	PAREDONES	
64	OSCAR RAMON POBLETE POBLETE	7238989-1	CUTEMU S/N	PAREDONES	

65	MARIA BERNARDITA MUÑOZ REYES	10307811-3	CUTEMU	PAREDONES	
66	ZENAIDA ROSA CHAVEZ NAVARRO	9683258-3	CARRIZALILLO	PAREDONES	
67	JAIME RENE PEÑALOZA ORDENES	4914655-8	CARIZALILLO	PAREDONES	
68	JOSE ISAIAS URZUA CAVIERES	4510972-0	CARRIZALILLO	PAREDONES	
69	AGUSTO ELIAS ACEVEDO	4506765-3	CARRIZALILLO	PAREDONES	
70	ADELINA DE LAS MERCEDES CACERES LOPEZ	7063339-9	CARRIZALILLO	PAREDONES	
71	MANUEL BENITO CACERES TOLEDO	3129827-0	CARRIZALILLO S/N	PAREDONES	
72	MARIA ALICIA LOPEZ REYES	5688656-7	CARRIZALILLO	PAREDONES	
73	JORGE RAUL UÑOZ DIAZ	6019962-0	EL PERAL S/N	PAREDONES	83436404
74	PEDRO RENE CATOLAN MAYOR	4479094-7	CABECEROS S/N	PAREDONES	91698710
75	ERCIO ADRIAN PASTENE LOPEZ	4826271-2	LA CAPILLA S/N	PAREDONES	
76	OSCAR ANIBAL VALENZUELA TOLEDO	6355241-0	CARRIZALILLO	PAREDONES	
77	ALEJANDRO CORREA PEREZ	11143884-6	PUMANQUE S/N	PUMANQUE	83639992
78	ANA SOTO MUÑOZ	11678869-5	NILAHUE CORNEJO S/N	PUMANQUE	76106580
79	ADELINA PARRAGUEZ PARRAGUEZ	14499260-1	HACIENDA PUMANQUE S/N	PUMANQUE	89832929
80	ANASTACIO OYARZUN PEREZ	8728990-7	PEÑABLANCA S/N	PUMANQUE	61821506
81	AUDOMO TOBAR QUINTEROS	7975222-3	COLHUE S/N	PUMANQUE	81746337
82	CAROLINA GALAZ JIMENEZ	8998077-1	AV ROSAIO S/N	PUMANQUE	93402427
83	CRSTIAN RICARDO ROJAS GARRIDO	12781258-6	RICON LAS HIGUERAS	PUMANQUE	83597969
84	EDUARDO CASTRO MORAGA	7877436-3	RINCON EL SAUCE S/N	PUMANQUE	88608971
85	ELSA ROJAS SILVA	6669854-8	PUMANQUE S/N	PUMANQUE	92628875
86	EMILIANA VALENZUELA PEÑALOZA	7991869-5	RICON LA MINA S/N	PUMANQUE	86459155
87	ENEDINA EDL CARMEN BARAHONA DIAZ	9633443-5	COLHUE	PUMANQUE	722824773
88	ESTER GALVEZ MUÑOZ	7821197-0	HACIENDA MANUEL RODRIGUEZ	PUMANQUE	95602969
89	FRANCISCA GONZALEZ UBILLA	14050457-2	HACIENDA PUMANQUE S/N	PUMANQUE	83730769
90	GLORIA CORNEJO GONZALEZ	11278639-2	HACIENDA MANUEL RODRIGUEZ S/N	PUMANQUE	97216035
91	HAYDEE DE LA MERCEDES DONOSO ORTIZ	4030631-5	COLHUE	PUMANQUE	94804399
92	JOSE RAMIRO FARIAS MALDONADO	5965910-3	RANQUIHUE	PUMANQUE	87743449
93	JUAN MOYA MORALES	8755554-2	HACIENDA PUMANQUE S/N	PUMANQUE	

94	JUANJOSE ORELLANA GALVEZ	12414481-7	HACIENDA PUMANQUE	PUMANQUE	77347382
95	JULIO DEL CARMEN GONZALEZ FARIAS	9311935-5	HACIENDA PUMANQUE	PUMANQUE	53084277
96	MANUEL JESUS MIRANDA CORNEJO	8699096-2	,OLINEROS	PUMANQUE	
97	MANUEL JESUS SOTO CORNEJO	9059328-5	RINCON LOS PERALES	PUMANQUE	88661951
98	MARGARITA LUZ MARTINEZ VILLAGUA	9730395-9	RANQUIHUE	PUMANQUE	99044599
99	MARINA EUGENIA GUZMAN ARANEDA	12254990-9	MATA REDONDA	PUMANQUE	74964737
100	MARIO ANTONIO GALVEZ DONOSO	12368200-9	RANQUILHUE	PUMANQUE	82183213
101	OLIVIA ESTRADA DIAZ	10002618-1	RICON LOS PERALES S/N	PUMANQUE	68390685
101	ZENADA ORELLANA DONOSO	8119897-7	RANQUILHUE S/N	PUMANQUE	93707877
102	PATRICIA LIZANA BARRAZA	11368400-3	HACIENDA PUMANQUE	PUMANQUE	83884585
103	PATRICIO LEONARDO VILLAGUA DONOSO	12368200-9	RANQUILHUE	PUMANQUE	
104	PEDRO ALCANTARA SILVA SILVA	5101105-8	PEÑABLANCA S/N	PUMANQUE	68020724
105	RENE ACEVEDO FARIAS	11834755-2	HACIENDA PUMANQUE S/N	PUMANQUE	74570185
106	ROSA BARRAZA FARIAS	9924564-6	HACIENDA PUMANQUE S/N	PUMANQUE	99610169
107	ROSA RAMIREZ PARRAGUEZ	12781237-3	SANTA CLOTILDE S/N	PUMANQUE	61740653
108	TERGIA DEL CARMEN ARGOMEDO CORNEJO	5880962-9	COLHUE	PUMANQUE	87887881
109	VIVIANA DE LAS MERCEDES CACERES ROJAS	14301078-3	HACIENDA PUMANQUE	PUMANQUE	96818317
110	XIMENA DE LAS MERCEDES ESTRADA LEON	10828075-1	COLHUE	PUMANQUE	94300795
112	SOFIA AURELIA DEL CARMEN ACEVEDO DIAZ	10117746-7	RINCON DE LA MINA	PUMANQUE	77178381
113	JAIME OSVALDO ACEVEDO SOTO	4380707-2	EL LLOPE S/N	PUMANQUE	
114	JULIO ENRIQUE BAÑADOS GALARCE	6785433-0	RINCON DE LOS PERALES	PUMANQUE	83851956
115	ROSA ELENA BRITO GONZALEZ	4636254-3	EL LLOPE S/N	PUMANQUE	94073075
116	ELIZONDA BROWN GONZALEZ	5796052-3	EL LLOPE S/N	PUMANQUE	97827621
117	HECTOR CABRERA PARDO	9631009-9	LA QUESERA S/N	PUMANQUE	95618753

118	TERESA CASTILLO BAEZ	5288297-4	LA GLORIA S/N	PUMANQUE	95489543
119	ELVA DEL CARMEN CORNEJO GONZALEZ	6424860-1	LA GLORIA S/N	PUMANQUE	722824783
120	PASCUAL CORNEJO GONZALEZ	7992311-7	R LA HIGUERA S/N	PUMANQUE	57450331
121	SONIA DEL CARMEN DIAZ DIAZ	5257021-2	LA GLORIA S/N	PUMANQUE	99558478
122	PEDRO DIAZ SILVA	8801287-9	CAMERICO S/N	PUMANQUE	99582577
123	CELIA MARGARITA DUQUE CONTRERAS	7497354-1	CAMARICO S/N	PUMANQUE	98277713
124	JUAN HUMBERTO ESPINOZA	9191520-0	R LA HIGUERA S/N	PUMANQUE	52055291
125	AUGUSTO GAETE NAVARRO	5946142-7	NILAHUE CORNEJO	PUMANQUE	88786990
126	GABRIEL GALAZ GONZALEZ	4721319-3	AV ESTADIO S/N	PUMANQUE	74214628
127	JUAN ROSENDO GALAZ LEITON	6808066-5	RINCON LA HIGUERA S/N	PUMANQUE	
128	MANUEL FRANCISCO GALVEZ DONOSO	4170491-8	MATAREDONDA S/N	PUMANQUE	85473573
129	BERTA DEL CARMEN GONZALEZ ESPINOZA	7833588-0	PEÑABLANCA S/N	PUMANQUE	
130	MARA ISABEL GONZALEZ GALAZ	10008479-1	RINCON LA HIGUERA S/N	PUMANQUE	85432013
131	RODRIGO ORLANDO GONZALEZ GALAZ	12316255-2	CAMARICO S/N	PUMANQUE	81630407
132	JOSE DANIEL GONZALEZ PERE<	11698201-3	R EL SAUCE S/N	PUMANQUE	62825539
133	JOSE BLUTERIO HERRERA LEON	4293145-4	PEÑABLANCA S/N	PUMANQUE	
134	JUAN HELSON LARENAS RAZ	8656487-4	COLHIE S/N	PUMANQUE	
135	OLGA DEL CARMEN LEON PEREZ	7450634-8	CAMARICO S/N	PUMANQUE	93776918
136	EMA DE LAS MERCEDES LEON PEREZ	9712581-3	CAMARICO S/N	PUMANQUE	89573331
137	CLEMENCIA DE LAS MERCEDES OYARZUN PEREZ	7502387-1	PEÑABLANCA	PUMANQUE	77164938
138	MARIA FILOMENA PARDO PIÑA	5307841-9	NILAHUE CORNEJO S/N	PUMANQUE	96418142
139	GEMA PEREZ CACERES	11278787-9	COLHUE S/N	PUMANQUE	90346993
140	RAUL PEREZ RAMIREZ	5844190-2	RINCON LOS PERALES	PUMANQUE	99527862
141	FERNANDO HERNON PIÑA CARO	9496345-1	R. LOS PERALES S/N	PUMANQUE	88777385

142	MAGHA QUINTEROS OYARZUN	13561497-1	PEÑABLANCA	PUMANQUE	99547885
143	HECTOR ROJAS DIAZ	7276231-2	LA PALMILLA S/N	PUMANQUE	81760303
144	AMALIA DEL CARMEN SANCHEZ SALINAS	9973679-8	RINCON DE LA MINA S/N	PUMANQUE	99838072
145	MARIA SONIA VLADIVIA CORREA	11057652-8	RONCON EL SAUCE S/N	PUMANQUE	94809314
146	BRISTELA GONZALEZ VILLABLANCA	8343989-0	LOS PASILLOS S/N	LA ESTRELLA	85131706
147	ANTONIA ACEVEDO VARGAS	5936334-4	EL CAJON S/N	LA ESTRELLA	82777316
148	ROBERTINA ESCOBAR GONZALEZ	5735966-8	EL CAJON S/N	LA ESTRELLA	78019744
149	LAVARO PINO CACERES	8645263-4	ESTERO SECO S/N	LA ESTRELLA	68316830
150	PABLO MORENO VILLABLANCA	10936801-6	AV CARDENAL CARO S/N	LA ESTRELLA	93274261
151	MARGARITA CACERES	7941372-0	LA AGUADA S/N	LA ESTRELLA	82577970
152	HERNAN CAMPOS LAGOS	6651280-0	RAMON IBARRA S/N	LA ESTRELLA	95671663
153	HECTOR CAMPOS RODRIGUEZ	4630158-7	LA PATAGUILLA S/N	LA ESTRELLA	77340267
154	ROSA OLGUIN GONZALEZ	9339998-6	LAS DAMAS S/N	LA ESTRELLA	68306571
155	CECILIA RODRIGUEZ DONOSO	11554076-9	LOS CARDILLOS S/N	LA ESTRELLA	53476615
156	DANILO MENARES VARGAS	10245516-9	LA AGUADA S/N	LA ESTRELLA	67698779
157	MONICA HERRERA TOBAR	9700693-8	LA AGUADA S/N	LA ESTRELLA	74916762
158	CLEMENTE ULLOA CABEZAS	7322500-0	GUADALAO S/N	LA ESTRELLA	99547871
159	ROBERTO OSORIO CORNEJO	4075131-9	EL CAJON S/N	LA ESTRELLA	81346220
160	LUIS HERRERA HUERTA	5681318-7	LA AGUADA S/N	LA ESTRELLA	64725186
161	EDUARDO MONJE ESCOBAR	7510820-6	EL PIHUELO S/N	LA ESTRELLA	94636636
162	SILVIA PASTRIAN CACERES	6428115-1	SAN GABRIEL S/N	LA ESTRELLA	96556592
163	DANILO BECERRA GONZALEZ	14545227-9	GUADALAO S/N	LA ESTRELLA	83583307
164	FELIX GONZALEZ VILLABLANCA	7804135-8	LOS PASILLOS S/N	LA ESTRELLA	81791419
165	MARIO BAEZA MOYA	4693451-2	EL PIHUELO S/N	LA ESTRELLA	87800593

166	MARCIAL RIVERA HERRERA	8610576-4	GUADALAO S/N	LA ESTRELLA	88622093
167	CARLOS CORNEJO HIDALGO	9045346-7	GUADALAO S/N	LA ESTRELLA	58857581
168	IRMA ULLOA LARA	10617523-3	GUADALAO S/N	LA ESTRELLA	94459635
169	JORGE ORELLANA CACERES	9943313-2	LA ESTRELLA S/N	LA ESTRELLA	
170	KUIS SILVA VASQUEZ	3420835-2	QUEBRADA DE LA VIRGEN S/N	LA ESTRELLA	77304224
171	MANUEL GONZALEZ VIDAL	6458806-0	EL CAJON S/N	LA ESTRELLA	76025757
172	SUSANA PARRA FERNANDEZ	10566851-1	LA AGUADA S/N	LA ESTRELLA	95595719
173	MARIANO HUERTA CORNEJO	3546784-1	LA AGUADA S/N	LA ESTRELLA	88425434
174	NOLDO LEON YAÑEZ	7266328-4	LA AGUADA S/N	LA ESTRELLA	
175	SERAFIN PEREZ CABEZAS	11786605-1	GUADALAO S/N	LA ESTRELLA	91690393
176	LEONARDO HERRERA HUERTA	11397828-7	LA AGUADA S/N	LA ESTRELLA	91846521
177	HECTOR HERRERA ULLOA	5882493-3	GUADALAO S/N	LA ESTRELLA	95848651
178	HERNAN PALOMINOS CABELLO	6896569-1	LOS PASILLOS S/N	LA ESTRELLA	
179	NORMA HERRERA HUERTA	12314835-5	LA AGUADA S/N	LA ESTRELLA	85064307
180	LORETO CAMPOS MATTA	14327840-9	GABRIELA MISTRAL S/N	LA ESTRELLA	89637512
181	NORA OSORIO OSORIO	5460762-8	EL CAJON S/N	LA ESTRELLA	98313516
182	CARLOS NARCISO OSORIO CORNEJO	9951760-3	SAN RAFAEL	LA ESTRELLA	96270248
183	VICTORIA DE LOURDES PINO CERON	11759955-8	LA ESTRELLA	LA ESTRELLA	93765775
184	MARIA EUGENIA ABARCA HERNANDEZ	11981700-5	LA AGUADA S/N	LA ESTRELLA	78013000
185	FLORA ROSA TOBAR CACERES	4031271-4	EL VALLE S/N	LA ESTRELLA	95233877
186	MARIA PILAR VIDAL OSORIO	11786568-1	LA AGUADA S/N	LA ESTRELLA	89839991
187	GERMAN ENRIQUE SOTO DEL PINO	13777093-8	Q DE LA VIRGEN S/N	LA ESTRELLA	63286211
188	LUIS ADILIO CARO ESCOBAR	5384382-4	LA AGUADA S/N	LA ESTRELLA	88651839
189	DORIS CECILIA REIS OLIVARES	7038495-7	LA ESTRELLA	LA ESTRELLA	76300423

190	MARCELA DEL CARMEN RUBIO BEAS	13033527-6	LOS PASILLOS S/N	LA ESTRELLA	93317531
191	VENTURA ROSA ORELLANA MENARES	10000907-2	EL CAJON S/N	LA ESTRELLA	93668077
192	JOSE MANUEL HERRERA HUERTA	4075522-5	LA AGUADA S/N	LA ESTRELLA	88553201
193	JUAN LUIS CACERES DONOSO	7347304-7	ESTERP SECO S/N	LA ESTRELLA	96247176
194	IRMA DEL CARMEN PASTRIAN PINO	6172921-6	LA ESTRELLA	LA ESTRELLA	97408457
195	URZULA MARIA TAPIA RIVERA	9567047-4	LA ESTRELLA	LA ESTRELLA	95663860
196	IGNACIO ANDRES PINO OSORIO	17620621-7	ESTERO SECO S/N	LA ESTRELLA	77178200
197	MARIO BENEDICTO DONOSO	10470915-1	SAN RAFAEL S/N	LA ESTRELLA	83154188
198	LUZMENIA DEL CARMEN CERON GONZALEZ	5961150-1	LA ESTRELLA	LA ESTRELLA	68602414
199	LUIS RAUL DONOSO CACERES	9044371-2	SAN RAFAEL S/N	LA ESTRELLA	97473274
200	MERCEDES ISABEL NAVEA PINO	6871786-8	LA AGUADA S/N	LA ESTRELLA	81310493
201	DILIA PINO DIAZ	6777778-6	ESTERO SECO S/N	LA ESTRELLA	85444626
202	LORENZO JIMENEZ FAUNDEZ	6392580-2	LA ESTRELLA	LA ESTRELLA	83425583
203	JAIME ENRIQUE PADILLA FERNANDEZ	6516291-1	COIPUE S/N	LA ESTRELLA	93715752
204	ELADIO MENARES MENARES	5777254-9	LA ESTRELLA	LA ESTRELLA	89880300
205	VERONICA HIDALGO LAGOS	11760073-4	LAS CHACRAS S/N	LA ESTRELLA	83913688
206	MARJORE MORENO TOBAR	13498961-0	SAN MIGUEL S/N	LA ESTRELLA	94553275
207	LUIS ERADIO HIDALGO CORNEJO	6961579-1	LAS CHACRAS S/N	LA ESTRELLA	62933962
208	JUAN JIMENEZ FAUNDEZ	6449317-5	LA ESTRELLA	LA ESTRELLA	74559595
209	JUAN ANTONIO VIDAL PINO	4004777-8	SAN MIGUEL S/N	LA ESTRELLA	91958145
210	VICTOR EDUARDO PINO ARRUE	6632267-1	SAN MIGUEL S/N	LA ESTRELLA	77321126
211	MARIA ARELLANO TOBAR	4645676-9	LOS CARDILLOS S/N	LA ESTRELLA	92737682
212	NERINDA DEL CARMEN CACERES GALVEZ	6751229-4	LOS CARDILLOS S/N	LA ESTRELLA	92845047
213	JUAN CAMPOS CANALES	5616331-1	LOS CARDILLOS S/N	LA ESTRELLA	81737720

214	FLORENTINO DEL CARMEN RIVERA TAPIA	3803920-2	COIPUE S/N	LA ESTRELLA	83806105
215	ANA ARELLANO TOBAR	7086898-9	LOS CARDILLOS S/N	LA ESTRELLA	97789388
216	ZOILA ROSA ROJAS ORELLANA	6432599-1	LA AGUADA	PICHILEMU	85935015
217	JOSE PARREGUEZ PIÑA	5841754-1	EL MAQUI	PICHILEMU	77172253
218	GUIDO CORNEJO VARGAS	12315877-6	CARDONAL DE PANILONCO	PICHILEMU	
219	FERNANDO CAVIERES CAVIERES	12179496-9	CARDONAL DE PANILONCO	PICHILEMU	65315921
220	SERGIO MARTINEZ ORELLANA	6032862-5	CAHUIL	PICHILEMU	90537288
221	JULIO ABARCA DEL PINO	10026908-2	ALTO RAMIREZ	PICHILEMU	
222	LIDIA LIZONA CORNEJO	5381614-2	ESPINILLO	PICHILEMU	
223	JOSE AGUSTIN VARGAS CARREÑO	4169424-6	ESPINILLO	PICHILEMU	
224	JOSE DANIEL PAVEZ DEL PINO	10355365-2	ESPINILLO	PICHILEMU	
225	LIDIA DEL CARMEN LOPEZ CAROCA	12315937-3	CARDONAL DE PANILONCO	PICHILEMU	94220375
226	LUIS GONZALEZ JORQUERA	3180839-1	QUEBRADA NUEVO REINO	PICHILEMU	71560690
227	CLAUDIA ROSA CATALAN MARTINEZ	11311767-2	CAHUIL	PICHILEMU	62419160
228	MANUEL LIZANA ARRAÑO	7797888-7	QUEBRADA NUEVO REINO	PICHILEMU	97651369
229	MARIA MIRELLA CABRERA TOBAR	7960143-1	LAS CANILLAS	PICHILEMU	
230	FRANCISCO NUÑEZ PAVEZ	8069432-6	EL MAQUI	PICHILEMU	
231	MARIA EMILIDA DONOSO LIZANA	6526563-1	ESPINILLO S/N	PICHILEMU	95224620
232	MIRIAM TERESA CATALAN RIVEROS	12515845-5	LAS COMILLAS S/N	PICHILEMU	61992173
233	RAFAEL HERNAN VARGAS URZUA	8198627-4	LA PALMILLA S/N	PICHILEMU	
234	JUAN MUÑOZ MARAMBIO	9511451-2	LA VILLA	PICHILEMU	
235	CECILIA ARROÑO	11555130-2	LA VILLA	PICHILEMU	
236	RAUL DEL PINO PINO	6175236-6	ESPINILLO	PICHILEMU	
237	CLAUDIA VARGAS LIZANA	3543421-8	ALTO RAMIREZ	PICHILEMU	

238	JOSE SIMON LIZANA VARGAS	6502584-1	ALTO RAMIREZ	PICHILEMU	
239	RAQUEL GAETE CORNEJO	7966380-8	ESPINILLO	PICHILEMU	
240	JOSE LUIS URZUA LIZANA	8625819-8	ALTO RAMIREZ S/N	PICHILEMU	
241	DANIEL DEL PINO DEL PINO	9634809-6	RODEILLO S/N	PICHILEMU	74816927
242	JAIME RICARDO CAROCA GONZALEZ	11131670-6	QUEBRADA NUEVO REINO S/N	PICHILEMU	99587768
243	MARIA CLOTILDE VARGAS QUINTERO	4161942-2	COGUIL S/N	PICHILEMU	
244	ALBERTO ANTONIO CORNEJO CORNEJO	7429394-8	RODEILLO S/N	PICHILEMU	94607785
245	ABRAHAM CLEMENTE URZUA CORNEJO	5213302-5	PAÑUL S/N	PICHILEMU	
246	LUYIS HERNAN PIÑA PEREZ	11555615-0	EL MAQUI S/N	PICHILEMU	
247	MANUEL DE LA CRUZ VARGAS VARGAS	5339916-9	CARDONAL DE PANILONCO S/N	PICHILEMU	
248	ANA MARIA CATALAN PINO	7283146-2	LA PLAZA S/N	PICHILEMU	
249	ELVA ROSA RODRIGUEZ BECERRA	7725175-8	QUEBRADA NUEVO REINO S/N	PICHILEMU	61752767
250	OFELIA DE LAS MERCEDES ESCOBAR PINO	5666706-7	EL MAQUI S/N	PICHILEMU	
251	RODRIGO ANDRES LABRACA PIÑA	12368596-2	EL MAQUI S/N	PICHILEMU	92623525
252	MARIO SOTO LIZANA	8638845-6	PAÑUL S/N	PICHILEMU	
253	LUIS ALFONSO GONZALEZ URZUA	4613308-0	PAÑUL S/N	PICHILEMU	83845570
254	PURISINA DE JESUS PAVEZ LIZANA	11760229-1	PAÑUL S/N	PICHILEMU	97308079
255	IVAN MIGUEL PINO PIÑA	12779215-1	RODEILLO S/N	PICHILEMU	89871505
256	EUGENIA LABARCA DEL PINO	8275209-9	RODEILLO S/N	PICHILEMU	68155506
257	JOSE LUIS URZUA LIZANA	8695819-8	ALTO RAMIREZ S/N	PICHILEMU	93212603
258	EUGENIA DEL CARMEN PAVEZ GONZALEZ	4775438-0	ALTO RAMIREZ S/N	PICHILEMU	68155506
259	CAROLINA ANGELICA CORNEJO JORQUERA	14013710-3	PAÑUL S/N	PICHILEMU	89945447
260	HECTOR MANUEL ORTEGA RETAMAL	11769370-8	CAHUIL S/N	PICHILEMU	85388424
261	ROJAS LIZANA ELBA ROSA	5400607-1	QUEBRADA	PICHILEMU	

262	CARREÑO JORUQERA GERARDINA DEL ROSARIO	11760175-7	CIRUELOS	PICHILEMU	89862976
263	GALAZ CORNEJO ELSA MARGARITA	9229354-8	QUEBRADA	PICHILEMU	
264	LIZANA PAVEZ PATRICIA ANGELICA	14352180-1	PAÑUL	PICHILEMU	99544495
265	LIZANA CARREÑO CARLOS JAVIER	7660960-8	QUEBRADA	PICHILEMU	
266	ROSSEL POZO PAULINA DEL CARMEN	9326360-1	LA VILLA	PICHILEMU	
267	ARANEDA ROJAS JIMEA ALICIA	8020695-1	CAHUIL	PICHILEMU	
268	LIZA GAGUELLILLOS JOVINO ANDRES	11760206-0	PAÑUL	PICHILEMU	
269	MUÑOZ LABARCA TERESA DE JESUS	9019355-4	RODEILLO	PICHILEMU	
270	LABARCA DEL PINO FLOR MARIA	6826052-3	RODEILLO	PICHILEMU	
271	PARRAGUEZ GALARCE ELENA PERPETUA	5798031-1	RODEILLO	PICHILEMU	
272	LIZANA CORNEJO CECILIA DE LAS MERCEDES	5774585-1	PAÑUL	PICHILEMU	
273	JIMENEZ CAROCA GUIDO HERNAN	7889984-0	CARDONAL	PICHILEMU	
274	CALDERON GONZALEZ JOSE ADAN	4781009-4	CADONAL	PICHILEMU	
275	CORNEJO VARGAS SOFIA DEL CARMEN	14535522-2	COGUIL	PICHILEMU	
276	CORNEJO CORNEJO PEDRO ANTONIO	8469494-0	RODEILLO	PICHILEMU	
277	LIZANA BECERRA EUGENIO RAFAEL	11398907-6	QUEBRADA	PICHILEMU	
278	ACEVEDO CORNEJO MARIA ISABEL	6446027-7	BARRANCAS	PICHILEMU	
279	ABARCA PIÑA JUAN CARLOS	11995167-4	RODEILLO	PICHILEMU	
280	ENRIQUE PINO PIÑA	7160436-5	ESPINILLO S/N	PICHILEMU	85990108
281	LUIS GONZALEZ DIAZ	10458082-3	BARRANCAS	PICHILEMU	92658566
282	LUIS ROSSEL GONZALEZ	4722087-4	PAÑUL	PICHILEMU	
283	MANUEL PEREZ ROMERO	6301299-8	LA VILLA	PICHILEMU	
284	ELEODORO LIZANA PAVEZ	4721671-0	PAÑUL	PICHILEMU	61831439
285	BERNARDITA MUÑOZ GONZALEZ	8067015-1	LA VILLA	PICHILEMU	74434899

286	PROBELIA ABARCA LABARCA	7211555-4	EL MAQUI	PICHILEMU	
287	JULIA PAVEZ LIZANA	5025963-3	PLAYA HERMOSA	PICHILEMU	90964261
288	PEDRO MUÑOZ PAVEZ	10335213-4	RODELILLO	PICHILEMU	
289	GLORIA MUÑOZ PIÑA	14616069-7	PAÑUL	PICHILEMU	76196577
290	GRACIELA DEL PINO GALAZ	5382262-2	RODELILLO SECTOR EL BOLDO	PICHILEMU	94221310
291	ROSA GALLEGUILLOS GONZALEZ	6218696-8	BARRANCAS	PICHILEMU	
292	MARIA LIZANA GALAZ	14531292-2	ALTO RAMIREZ	PICHILEMU	87862121
293	OSCAR TORRES MUÑOZ	7920711-1	BARRANCAS	PICHILEMU	96696382
294	JEANETTE PAVEZ VARGAS	12779160-0	PAÑUL	PICHILEMU	93795961
295	JOSE MUÑOZ LOPEZ	6421446-2	RODEILLO	PICHILEMU	96680670
296	ALVARITA BECERRA DONOSO	14352273-3	ESPINILLO	PICHILEMU	95224620
297	JORGE PAVEZ PULGAR	6076825-0	PAÑUL	PICHILEMU	89150579
298	MARIA ROSSEL JORQUERA	10076935-2	LA VILLA	PICHILEMU	
299	MARGARITA LIZANA VARGAS	66741188-4	ALTO RAMIREZ	PICHILEMU	96273660
300	MARIA VARGAS ABARCA	12161780-3	RODEILLO EL BOLDO	PICHILEMU	68148734
301	SAUL ANTONIO GALAZ VARGAS	11760206-0	ALTO RAMIREZ	PICHILEMU	
302	LUISA LEONOR GAETE ORTIZ	6530253-5	LA VILLA	PICHILEMU	
303	TORRES VARGAS MANUEL ALEJANDRO	15502113-6	BARRANCAS	PICHILEMU	71564232
304	SILVA VARGAS TEMISTOCLES FERNANDO	4724619-9	LA AGUADA	PICHILEMU	
305	SOTO RETAMALES NELLY AMELIA	7659367-1	BARRANCAS	PICHILEMU	
306	PROBLELIA MARGARITA CORNEJO MUÑOZ	12779173-2	LA VILLA	PICHILEMU	89305103
307	PARRAGUEZ PIÑA DANILO ANTONIO	6988861-5	EL MAQUI	PICHILEMU	
308	MORAGA RODRIGUEZ MANUEL	9239138-8	CAHUIL	PICHILEMU	58515627
309	LIZANA CORNEJO EDUARDO DE JESUS	11311666-8	ALTO RAMIREZ	PICHILEMU	77353219

310	LABARCA LABARACA HECTOR OMAR	3521683-9	EL MAQUI	PICHILEMU	
311	GONZALEZ MUÑOZ FRANCISCO ARMANDO	6710143-1	LA VILLA	PICHILEMU	
312	GONZALEZ CORNEJO ROSA DEL CARMEN	12165212-9	ALTO RAMIREZ	PICHILEMU	963011548
313	GALLEGUILLOS LIZANA ESTEBAN CELESTINO	9270667-2	BARRANCAS	PICHILEMU	
314	GAETE ORTIZ HUGO OCTAVIO	7991777-1	CAHUIL	PICHILEMU	
315	BECERRA LIZANA TERESA DE LOS DOLORES	11311688-9	ESPINILLO	PICHILEMU	99524118
316	CARO BUSTAMANTE DIONISIO JESUS	11760091-2	CARDONAL	PICHILEMU	81707422
317	ABARCA DEL PINO MARIA MARISOL	11760171-4	CAHUIL	PICHILEMU	
318	MARIA LIZANA ABARCA	11555106-1	PUEBLO DE VIUDAS S/N	PICHILEMU	97262565
319	ROSA GONZALEZ GAJARDO	11999721-7	CAHUIL S/N	PICHILEMU	93464361
320	ELIZABETH GONZALEZ VIDAL	15497562-4	LA AGUADA S/N	PICHILEMU	92366737
321	MARIA CALDERON VARGAS	11760104-8	CARDDONAL DE PANILONCO S/N	PICHILEMU	74626549
322	ROSA MARGARITA LIZANA LIZANA	8143096-9	QUEBRADA NUEVO REINO S/N	PICHILEMU	88529943
323	JUAN CORNEJO TOBAR	6433196-5	LAS COMILLAS S/N	PICHILEMU	71664898
324	ROBERTO GONZALEZ GONZALEZ	8745077-5	CIRUELOS S/N	PICHILEMU	83587446
325	MARIA LIZANA CARREÑO	12012214-2	QUEBRADA DE NUEVO REINO S/N	PICHILEMU	83909234
326	ROSA GONZALEZ POLANCO	12315975-6	CAHUIL S/N	PICHILEMU	773821117
327	MARIA RODRIGUEZ BECERRA	13209721-6	QUEBRADA DE REINO NUEVO S/N	PICHILEMU	89926262
328	ELISA MORALES PAVEZ	11760176-5	QUEBRADA DE NUEVO REINO S/N	PICHILEMU	99634242
329	ELIANA LIZANA ROJAS	12315942-1	QUEBRADA DE NUEVO REINO S/N	PICHILEMU	94305870
330	FLAVIO CACERES CARREÑO	9066769-6	CARDONAL DE PANILONCO S/N	PICHILEMU	83563057
331	CATALAN MARTINEZ JAQUELINE DE LAS MERCEDES	10847769-5	CAHUIL S/N	PICHILEMU	62800354
332	MARIA CALDERON GOMEZ	9673488-3	CARDONAL DE PANILONCO S/N	PICHILEMU	81742005
333	HUGO POLANCO DIAZ	9937170-6	CARDONAL DE PANILONCO S/N	PICHILEMU	

334	LEONEL FERNANDO VIDAL VASQUEZ	10444943-3	CAMINO A LOS MOTORES	NAVIDAD	89668946
335	MARIA ALICIA OJEDA REYES	5313550-1	CAMINO PUBLICO	NAVIDAD	92523657
336	MOISES ANTONIO REYES SOTO	5251391-1	SAN RAFAEL	NAVIDAD	96880333
337	LULY DE LAS MERCEDES JIMENEZ SILVA	7280645-1	LICHANCHEN BAJO	NAVIDAD	71529608
338	CARMEN GLORIA ROMANM OLGUIN	8903091-9	EL CULENAR	NAVIDAD	94800234
339	LUISNAVIA ROMERO	5060730-5	TUMAN	NAVIDAD	
340	CARLOS CEPEDA CEPEDA	7477295-1	NAVIDAD	NAVIDAD	
341	CARLOS RAMIREZ RUBIO	9656423-6	RISCO COLORADO	NAVIDAD	
342	URBANO SOTO FLORES	9453808-4	LA PALMILLA	NAVIDAD	
343	JUAN SILVA TOLOZA	9509717-0	EL MANZANO	NAVIDAD	
344	FLORINDO MUÑOZ FLORES	2781209-	EL MANZANO	NAVIDAD	
345	FRANCISCO DONISO VILCHES	3828391-1	CENTINELA	NAVIDAD	
346	EDUARDO FLORES SILVA	4256144-4	EL CHORRILLO	NAVIDAD	
347	SALVADOR CABELLO CARREÑO	5991295-1	LA POLCURA	NAVIDAD	
348	NAVOR HERNANDEZ CESPEDES	7291640-9	EL PERAL	NAVIDAD	
349	MIGUEL PEREZ CABELLO	6961920-7	LA PALMILLA	NAVIDAD	
350	LUIS PINO ARRIAZA	5374292-0	LOS MAYOS	NAVIDAD	
351	LUIS MUÑOZ ZUÑIGA	8838212-9	TUMAN	NAVIDAD	
352	JUVENAL DONOSO GOMEZ	11434823-2	CENTINELA	NAVIDAD	
353	HECTOR ARAYA RAMIREZ	6457821-9	LINCANCHEU	NAVIDAD	
354	JUAN CASTRO FLORES	4268372-8	EL CHORRILLO	NAVIDAD	
355	JUSN JIMENEZ UGARTE	10151430-7	LA PLAMILLA	NAVIDAD	
356	JOSE CARREÑO CASTRO	3710377-2	EL MANZANO	NAVIDAD	
357	EMA DONOS GOMEZ	9793679-9	LA VEGA DE PUPUYA	NAVIDAD	

358	SERGIO UGARTE FARIAS	10455893-3	PUPUYA SUR	NAVIDAD	
359	FIDEL ORELLANA MALDONADO	5693760-9	PUPUYA SUR	NAVIDAD	
360	OLGA HUERA ORELLANA	78720700-	VALLE HIDANGO	NAVIDAD	
361	FIDEL FLORS FLORES	4493299-7	EL MAITEN	NAVIDAD	
362	JOSE RAMOS NUÑEZ	7976486-8	PAULUN	NAVIDAD	
363	JOSE FARIAS CAROCA	5453301-2	EL MAITE	NAVIDAD	
364	GUILLERMO CORNEJO SOTO	5312884-1	EL MAITEN	NAVIDAD	
365	FLORINDO FLORES FLORES	3999317-1	EL MAITEN	NAVIDAD	
366	REINALDO MOYA GONZALEZ	4378895-7	EL MANZANO	NAVIDAD	
367	FROILAN FLORES SOTO	7594698-8	EL MAITEN	NAVIDAD	
368	LUIS ENRIQUE CABELLO AMESTICA	8060039-9	NAVIDAD PONIENTE S/N	NAVIDAD	
369	ROSENDO ORELLANA ORELLANA	7248624-2	VALLE HIDANGO	NAVIDAD	
370	ZULEMA FLORES FLORES	3717824-1	EL MAITEN	NAVIDAD	
371	ALMIRO ORELLANA FLORES	6657065-7	AL AGUADA	NAVIDAD	
372	LUIS ACEVEDO IBARRA	5725390-8	CENTINELA	NAVIDAD	
373	JOSE ORELLANA GONZALEZ	8610650-7	LA GUADA	NAVIDAD	
374	ROSALINDA DEL CARMEN CABRERA CARVACHO	2867426-0	RINCONADA DE HALCONES	MARCHIGÜE	92868894
375	JUANA MARIA CANALES POZO	4610599-0	LAS GARZAS	MARCHIGÜE	81945425
376	LEONIDAS GONZALO ROJAS VIDAL	10880369-1	MALLERMO	MARCHIGÜE	
377	JUAN DE LA CRUZ PINO OSORIO	2334343-6	RINCONADA DE HALCONES	MARCHIGÜE	99506150
378	JOSE ENRIQUE ORELLANA ROJAS	14301098-8	MELLERMO	MARCHIGÜE	94807572
379	LUIS ENRIQUE CLAVIJO CLAVIJO	5297041-5	PAILIMO	MARCHIGÜE	
380	GUSTAVO ALBERTO GAETE ERAZO	10552382-3	PAILIMO	MARCHIGÜE	68304550
381	GABRIELA ISABEL LISBOA MELENDEZ	14573355-3	RINCONADA DE HALCONES	MARCHIGÜE	81703703

382	CRISTOBALINA ANGELICA LAGOS MORENO	8936625-9	PAILIMO	MARCHIGÜE	57094552
383	SAMUEL DE JESUS DIAZ GONZALEZ	7125715-0	LAS GARZAS	MARCHIGÜE	76514686
384	PEDRO ABLL DIAZ GONZALEZ	8272490-7	LAS GARZAS	MARCHIGÜE	78028258
385	EMA DE LAS MERCEDES ROJAS MORALES	11398903-3	MALLERMO	MARCHIGÜE	88784615
386	KARIN ALENJADRA MELENDES MELENDES	13097013-3	RINCONADA DE LOS HALCONES	MARCHIGÜE	85524859
387	ALBERTO LUIS DEL CARMEN CONTRERAS MAULEN	4896800-1	MALLERMO	MARCHIGÜE	
388	BENEDICTA DE JESUS GALVEZ ESPINOZA	6335099-0	LA PITNA	MARCHIGÜE	
389	DEIDAMIA DE LAS M. CARVAJAL MORENO	11278020-3	TRINIDAD S/N	MARCHIGÜE	92629758
390	MARIA ISABEL CARVAJAL MORENO	10100057-5	TRINIDAD S/N	MARCHIGÜE	94241287
391	JULIA ALEJANDRA QUYINTEROS OYARZUN	12139447-2	LA QUEBRADA S/N	MARCHIGÜE	
392	RAQUEL MARIA PEÑA SILVA	8649904-5	LA QUEBRADA S/N	MARCHIGÜE	89153767
393	IRIS NORMANDIA VARGAS DIAZ	5069636-7	LA QUEBRADA S/N	MARCHIGÜE	94445735
394	OSCAR SEGUNDO YAÑEZ HERRERA	3822340-2	LA QUEBRADA S/N	MARCHIGÜE	97627132
395	ISAIAS ELISEO DEL C. PEREZ CORNEJO	6522275-2	LA QUEBRADA S/N	MARCHIGÜE	
396	JUAN LUIS SILVA QUINTEROS	6403599-1	TRINIDAD S/N	MARCHIGÜE	
397	NELIS DE LOS ANGELES RIVERA SILVA	8562245-5	SAN MIGUEL DE VILUCO	MARCHIGÜE	93437488
398	FERNANO JOSE CARREÑO MOYA	5490313-8	TRINIDAD S/N	MARCHIGÜE	97261853
399	DORIS MARIA CORNEJO PALOMINO	10752503-3	LA QUEBRADA S/N	MARCHIGÜE	93814811
400	MARCO ALEJANDRO CATALAN LACANOS	8444626-2	LA QUEBRADA S/N	MARCHIGÜE	92441173
401	ISABEL CASTRO ALLENDE	14247107-8	RULO 90	MARCHIGÜE	88588850
402	JUAN ANTONIO LEIVA ARRUE	5013425-1	RINCONADA DE HALCONES	MARCHIGÜE	
403	JOEL DE LA CRUZ GUTIERREZ PEREZ	4995868-4	RUTA 90	MARCHIGÜE	92812062
404	JULIA ROSA LEIVA FUENTES	8167483-3	TRINIDAD	MARCHIGÜE	61867707
405	MARIA DEL CARMEN LEIVA FUENTES	11068584-1	TRINIDAD	MARCHIGÜE	85377445

406	MARIA ANGELICA BECERRA FUENZALIDA	7724588-1	RUTA 90	MARCHIGÜE	92867951
407	MARIA GEMITA YAÑEZ SILVA	10036292-9	LA QUEBRADA	MARCHIGÜE	94829141
408	DANIEL DEL CARMEN MORENO LOPEZ	11995540-8	POBLACION	PERALILLO	62117699
409	SERGIO HERNAN SILVA DURAN	9188720-7	LAS GARZAS	MARCHIGÜE	
410	GEORGINA ROSA GUAJARDO CONTRERAS	5680319-1	MARLLERMO	MARCHIGÜE	
411	ZOILA ROSA MOROS LEIVA	7512573-9	CALLEJON LAS ROSAS	MARCHIGÜE	76349112
412	JAVIER ROJAS ORELLANA	8812854-0	MALLERMO	MARCHIGÜE	
413	ALEJANDRO IVAN ROJAS ORELLANA	11277988-4	MALLERMO	MARCHIGÜE	
414	RAMON LUIS GONZALEZ GALVEZ	14521403-3	PAILIMO	MARCHIGÜE	
415	MARIA TERESA HUERTA VIDAL	8206717-5	PAILIMO	MARCHIGÜE	
416	LUIS EFRAIN CACERES MALDONADO	5219505-5	POBLACION	PERALILLO	94209819
417	JUAN DE LA CRUZ HUERTA VIDAL	7085736-7	PAILIMO	MARCHIGÜE	
418	GERARDO DE JESUS ROJAS ORELLANA	9939181-2	MALLERMO	MARCHIGÜE	
419	GERMAN ENRIQUE CARVAJAL MORENO	14332495-8	MARCHIQUE	MARCHIGÜE	88615185
420	GABRIELA HUERTA VIDAL	4584730-6	PAILIMO	MARCHIGÜE	
421	ROSA INES LEIVA FUENTES	9594544-9	TRINIDAD	MARCHIGÜE	97691434
422	JOSE LEON CAMPOS LIZANA	6881164-3	RUTA 90	MARCHIGÜE	68750006
423	EUSEBIO ERNESTO ROJAS VIDAL	3970420-1	S M VILUCO	MARCHIGÜE	91930233
424	RUBEN SILVA PINO	4003676-8	YERBAS BUENAS S/N	MARCHIGÜE	85218775
425	MARY LUZ DEL CARMEN CASTILLO ROJAS	6497010-0	S M VILUCO S/N	MARCHIGÜE	92574170
426	JUAN LUCIA DEL CARMEN LEIVA FUENTES	3933601-4	TRINIDAD S/N	MARCHIGÜE	85373787
427	MERCEDES ROSA PEREZ PEÑA	7233867-8	LA QUEBRADA S/N	MARCHIGÜE	88772316
428	DARWIN RENE ROJAS PINO	14013550-1	MALLERMO	MARCHIGÜE	
429	ROSA DEL CARMEN ARAYA ARAYA	6254314-0	LAS GARZAS	MARCHIGÜE	90661734

430	JORGE ALEJADRO GARRIDO FUENTES	5849635-9	TRINIDAD S/N	MARCHIGÜE	
431	AMON ANTONIO GUTIERREZ CATALAN	5841811-0	LA QUEBRADA S/N	MARCHIGÜE	58323473
432	LAURA ROSA VIDAL ARRUE	7180182-9	SAN MIGUEL DE VILUCO S/N	MARCHIGÜE	85134159
433	GRACIELA DEL CARMEN HIDALGO JIMENEZ	10636942-9	TRINIDAD S/N	MARCHIGÜE	92635058
434	ISOLINA XIMENA CAMPOS CAMPOS	9347123-7	LA QUEBRADA S/N	MARCHIGÜE	93800933
435	DANIELA ISABEL SARMIENTO RIVERA	15559369-5	CHEQUEN S/N	MARCHIGÜE	61654815
436	MANUEL GUAJARDO LEIVA	5972234-4	R. DE HALCONES	MARCHIGÜE	
437	PAULINA RUZ GONZALEZ	10349787-6	RINCONADA DE HALCONES	MARCHIGÜE	
438	JUAN TOBAR MAULEN	9324040-5	MALLERMO	MARCHIGÜE	
439	GASTON NICADENO PEREZ YAÑEZ	6016514-9	CARTAGENA S/N	LITUECHE	85615368
440	CLAUDIO PATRICIO YAÑEZ YAÑEZ	15497764-3	LA VILLA S/N	LITUECHE	91505018
441	ANA MARIA ARMIJO CARRASCO	9276148-6	OBISPO LARRAIN 1833	LITUECHE	96257912
442	XIMENA DEL CARMEN CORNEJO DONOSO	9924263-9	PULIN S/N	LITUECHE	92313134
443	MARIA ANGELICA JOVINA MORALES MORALES	12778883-9	MATANCILLA	LITUECHE	94466453
444	ORLANDO ALEJANDRO YAÑEZ ORELLANA	11757565-9	LA VILLA	LITUECHE	93385826
445	LUIS GUILLERMO ORELLANA SOLIS	8177361-0	MANQUEHUA	LITUECHE	94605378
446	ROSA ERMINIA SERRANO UGALDE	7602688-2	MATANCILLA	LITUECHE	72974964
447	ERMELINDA DEL CARMEN MILLARES SILVA	10511195-9	QUELENTARO	LITUECHE	98556855
448	GABRIEL LEIGHTON CASTRO	4418081-2	VALLE HIDANGO	LITUECHE	85153126
449	MARCELINO REYES PALACIO	5681469-8	SAN VICENTE DE CUCALAN	LITUECHE	62818278
450	LUIS OMAR SOTO GUERRERO	7907247-8	PULIN	LITUECHE	82271996
451	AUGUSTO ANTONIO YAÑEZ	4319121-7	CAMINO HALCONES	LITUECHE	
452	MARIA ROSENDA PALMA DONOSO	5443031-0	CARDENAL CARO 834	LITUECHE	851038
453	HECTR ENRIQUE FARIAS CABEROS	6940838-9	EL ROSAL 324	LITUECHE	74420302

454	ADRIANO SOTO GUERRERO	6708688-0		LITUECHE	93419562
455	LUIS MARIANO GUERRERO CARREÑO	5060997-9		LITUECHE	
456	ALFONSO MARIA LIBORIO CONTRERAS CARREÑO	2806212-5	CARTAGENA	LITUECHE	93799837
457	FERNANDO CASTRO CASTRO	5180775-8	PARCELA EL GUINDO	LITUECHE	666313538
458	JULIA JARA ORELLANA	5844068-1	PASAJE JOHN KENNEDY 871	LITUECHE	74725087
459	JOSE HUMBERTO HERNANDEZ FLORES	5690374-7	SAB VICENTE PUCALAN UCUQUEN	LITUECHE	89344000
460	CARLOS ENRIQUE GUERRERO CARREÑO	5657316-1	PULIN	LITUECHE	85319187
461	JOSE GERMAN PALMA OSORIO	6963775-2	LAS ACACIAS	LITUECHE	53727461
462	MARIO DELFIN NAVARRO CANALES	4586775-7	RANQUILCO	LITUECHE	99073030
463	PEDRO HERNAN CACERES ATENAS	9018144-0	VILLA MANANTIALES	LITUECHE	95223452
464	PEDRO JOSE ACEITUNO FARIAS	5453303-9	LA PALMILLA	NAVIDAD	68775272
465	NELSON ARELLANO ATENAS	6760376-1	LA VILLA	LITUECHE	97284916
466	HERNAN ORELLANA FLORES	5551472-0	PASCUALA PESQUEN 391	LITUECHE	
467	PEDRO OLGUIN GONZALEZ	10219884-0	AV OBISPO LARRAIN 842	LITUECHE	62851447
468	CLAUDIO REYES NAVIA	9732885-4	RUCATALCA	NAVIDAD	83679991
469	NADIA DEL CARMEN ARELLANO ARELLANO	15457411-5	LA VILLA	LITUECHE	74331712
470	TOMAS ESAUD OSORIO ACUÑA	8570717-5	MATANCILLA	LITUECHE	64902551
471	HERALDO HERNAN DONOSO ORELLANA	7449675-1	PASAJE SAN FERNANDO 576	LITUECHE	88425458
472	ROSALINDO MENARES REYES	4146663-4	HIJUELAS SANTA JULIA N°5	LITUECHE	89677250
473	ENRIQUE LEON ACUÑA	9775145-5	MATANCILLA	LITUECHE	97815380
474	LIBERTO SEGUNDO POLANCO NUÑEZ	4820012-5	COGUIL	PICHILEMU	
475	ZOILA ELENA MUÑOZ MARTINEZ	10013195-1	RINCON LAS OVEJAS	LOLOL	89557867
476	NARCISO DEL CARMEN BRAVO CORNEJO	5615636-4	LOS TRICAHUES	LOLOL	75272277
477	AMADOR DEL CARMEN VELIZ VELIZ	8253349-4	LOS CHACAYES	LOLOL	

478	MALVINA INES GALDAMES	11556622-9	LOS TRICAHUES	LOLOL	97357931
479	YENNY LEANDRA ZAVALLA LIZANA	13571248-5	ALTO NERQUIHUE	LOLOL	95586128
480	FRANCISCA JAVIERA UBILLA FREDES	8587216-8	ALTO NERQUIHUE	LOLOL	63262663
481	MARIO HERNAN LARENAS RODRIGUEZ	4665403-1	RINCON EL SAUCE	LOLOL	
482	ZULEMA ELSA CUBILLOS CUBILLOS	15497590-1	LOS CHACAYES	LOLOL	64648720
483	ANA MARIA PALMA BRAVO	8887787-1	LOS HORNOS	LOLOL	
484	MARIA ELENA JIMENEZ ORTIZ	8371458-1	ALTO NERQUIHUE	LOLOL	
485	SANDRA DIAZ VALENZUELA	13348305-5	LOS CHACAYES	LOLOL	
486	MIREYA VALENZUELA OLMEDO	8447932-2	LOS CHACAYES	LOLOL	
487	PURISIMA OLMEDO OLMEDO	12368843-0	LOS CHACAYES	LOLOL	92424272
488	ANA MARIA GONZALEZ CACERES	8134519-8	ALTO NERQUIHUE	LOLOL	68526175
489	RAUL URZUA URZUA	4840500-2	R DE QUIAHUE	LOLOL	
490	PEDRO MIGUEL GONZALEZ CAVIERES	4582061-0	EL MEMBRILLO	LOLOL	78726382
491	LUIS ALAMIRO JIMENEZ DONOSO	7158239-6	ALTO NERQUIHUE	LOLOL	
492	MARIA DE LAS MERCEDES DIAZ CORNEJO	4898185-2	ALTO NERQUIHUE	LOLOL	
493	ALFONSO BECERRA BRAVO	7598500-2	LOS ROBLES	LOLOL	
494	DANIEL DEL CARMEN URZUA	4691767-7	RINCONADA DE QUIAHUE	LOLOL	
495	MARGARITA SUSANA BECERRA BRAVO	10375367-8	LOS ROBLES	LOLOL	85514653
496	JUAN BERNARDO ROJAS URZUA	6588829-7	RINCONADA DE QUIAHUE	LOLOL	74930088
497	JUAN DE DIOS IGNACIO CUBILLOS ZUÑIGA	11280584-2	LA VEGA	LOLOL	
498	DORILA DEL TRANSITO CONTRERAS GONZALEZ	13781575-3	NILAHUE ALTO	LOLOL	
499	GLADYS DEL CARMEN BECERRA MARIN	14421075-1	NERQUIHUE	LOLOL	
500	CARLOS IGNACIO GALAZ CACERES	2991613-6	LA VEGA	LOLOL	
501	ELIANA LORCA VALDEZ	5403237-4	NERQUIHUE	LOLOL	

502	JOSE RODRIGUEZ MALDONADO	5979142-7	R DE QUIAHUE	LOLOL	
503	FANNY VALDERRAMA ITURRIAGA	7413211-1	NERQUIHUE	LOLOL	
504	SONIA DEL CARMEN ZUÑIGA MUÑOZ	10774680-3	LA VEGA	LOLOL	93812345
505	LUCINDA VALENZUELA GALAZ	9654452-9	VILLA MANUEL LARRAIN	LOLOL	97254853
506	LUCIA VILLEGAS RODRIGUEZ	11015723-1	LA CABAÑA	LOLOL	
507	MANUEL BELISARIO CARTAGENA ITURRIAGA	7209230-9	NERQUIHUE	LOLOL	66184531
508	PETRONILA DEL CARMEN VILENEZ ZUÑIGA	8685853-1	LOS HORNOS VIEJOS	LOLOL	89940866
509	OSVALDO REYES MORALES	9016526-7	EL MEMBRILLO	LOLOL	
510	HUGO DEL CARMEN ZUÑIGA PAREDES	6033598-2	LA CABAÑA	LOLOL	88225853
511	NANCY GALAZ BUSTAMANTE	11555763-7	LA CABAÑA	LOLOL	67163920
512	JOSE DIONISIO VALENZUELA R.	12781574-7	LOS CHACAYES	LOLOL	74262263
513	ZULINDA VELIZ VELIZ	7874803-6	LOS CHACAYES	LOLOL	89869510
514	PATRICIO RAUL MEDINA BRAVO	11761074-8	LOS ROBLES	LOLOL	95696558
515	RAFAEL DEL CARMEN ALIAGA VELIZ	9469444-2	LOS CHACAYES	LOLOL	62980164
516	LIBORIO ORTIZ FREDES	12039215-8	RANGUILI	LOLOL	
517	HECTOR E. RODRIGUEZ MALDONADO	10917374-6	RINCONADA DE QUIAHUE	LOLOL	
518	LETICIA CECILIA RODRIGUEZ MALDONADO	12155676-6	RINCONADA DE QUIAHUE	LOLOL	91208171
519	MARIA A. DUQUE GONZALEZ	6457847-2	PUNTA DE LA PIEDRA	LOLOL	89163372
520	JUAN DIAZ GONZALEZ	8062333-1	ALTO NERQUIHUE	LOLOL	
521	NELSON HERNAN ALLENDE BARRERA	8072590-3	LA CABAÑA	LOLOL	93771617
522	ANTONIO DEL CARMEN GONZALEZ DUQUE	7353554-9	RINCON DE LOS UBILLAS	LOLOL	92876200
523	JOSE ANTONIO GONZALEZ GAETE	14331061-2	RINCON DE LAS UBILLAS	LOLOL	50336757
524	JIMENA RAMIREZ VILCHEZ	13202858-3	LA CABAÑA	LOLOL	
525	JAIME ALFONSO BERRIOS CACERES	5645222-2	LA CABAÑA	LOLOL	

526	URIEL DEL CARMEN GALAZ COFRE	13004804-8	LA CABAÑA	LOLOL	
527	ALTAMIRO DEL CARMEN BECERRA CERECEDA	4313796-4	LA CABAÑA	LOLOL	
528	LUIS OSVALDO BRAVO RAMIREZ	9544742-2	LA CABAÑA	LOLOL	
529	ROSA ELENA DUARTE PALOMINOS	10774411-8	LA CABAÑA	LOLOL	
530	MARIA ANGELICA DUQUE VENEGAS	6210983-1	LA VEGA	LOLOL	
531	JUAN ENRIQUE GAETE ARGOMEDO	10231489-1	RINCON LAS OVEJAS	LOLOL	
532	BRIGIDA IDILIA DE LAS MERCEDES DUQUE ZUÑIGA	5608051-1	LA VEGA	LOLOL	
533	GEMA ORELLANA OROZCO	15532332-9	RANGUILI	LOLOL	56369652
534	LUIS JAVIER ORELLANA FARIAS	4862315-8	RANGUILI	LOLOL	73626739
535	CRISTIAN A. GUAJARDO PIÑEDA	13791763-2	LA PRADERA	LOLOL	97222422
536	NICOLAS A. ALLENDE DIAZ	5246055-7	RINCON DE LAS OVEJAS	LOLOL	61688871
537	NANCY DEL CARMEN ZUÑIGA SILVA	9015452-4	NILAHUE BAJO	LOLOL	92616877
538	JOSE MANUEL BARROS CORNEJO	15948249-9	RANGUILI	LOLOL	74973753
539	LUIS E. ZUÑIGA ZUÑIGA	9822639-7	LA VEGA	LOLOL	
540	MIGUEL ALEJANDRO PARRAGUEZ ZUÑIGA	13571076-8	LA VEGA	LOLOL	97290927
541	ESTEBAN O. ZUÑIGA GONZALEZ	4789560-1	LA PALMA	LOLOL	95242494
542	DAGOBERTO PEÑALOZA GALAZ	5729250-4	NILAHUE	LOLOL	94609934
543	ALEJANDRO MUÑOZ MARTINEZ	7975454-4	NILAHUE ALTO	LOLOL	99521501
544	FLOR ACEITUNO GONZALEZ	8067749-9	LA CABAÑA	LOLOL	
545	JUAN FRANCISCO ORELLANA PICHUANTE	4511287-1	NILAHUE BAJO	LOLOL	73626739
546	MARIA LUISA GONZALEZ MUÑOZ	6755589-9	RINCON DE LAS UBILLAS	LOLOL	72667117
547	JUAN DE DIOS ZUÑIGA CUBILLOS	5806259-1	PUNTA DE LA PIEDRA	LOLOL	
548	MARIA INES GONZALEZ GUERRA	11555642-8	RANGUILI	LOLOL	94602655
549	GLORIA ORELLANA FARIAS	7091785-8	RANGUILI	LOLOL	99603097

550	REINALDO CASTRO LEIVA	6907855-9	LA HACIENDA	LOLOL	76229878
551	CRISTIAN RODRIGO PIÑEDA HERRERA	11199831-0	LA PRADERA	LOLOL	
552	VICTOR JOSE ORELLANA FARIAS	7964718-7	RANGUILI	LOLOL	95213704
553	NANCY V. BARROS NUÑEZ	7449016-6	RANGUILIL	LOLOL	91476099
554	VICTOR A. CUBILLOS ALLENDE	13004688-6	RINCON DE LAS OVEJAS	LOLOL	89167870
555	ENDINA ROSA GAETE ORTIZ	4935596-3	CAHUILS/N	PICHILEMU	52752001
556	LUPERTINA JIMENEZ CARO	10909323-8	COGUIL	PICHILEMU	
557	MARIA ARRAÑO VARGAS	11555211-2	QUEBRADA NUEVO REINO	PICHILEMU	
558	JOSE EDUARDO PIZARRO PEREZ	5739044-1	LAS CAMILLAS	PICHILEMU	53550167

ANNEX 2

CAPACITY DEVELOPMENT AND KNOWLEDGE MANAGEMENT PLAN

Project: “Enhancing Resilience to Climate Change of the Small Agriculture in the Chilean Region of O’Higgins (Chile)”

Implementing Agency: CHILEAN INTERNATIONAL COOPERATION AGENCY (AGCI)
Executing Agencies: MINISTRIES OF AGRICULTURE AND ENVIRONMENT

2015

Capacity Development and Knowledge Management Plan

Establishing the Baseline

The first activity of the project is to profile the *secano* area of the O'Higgins Region, including describing local soils, vegetation and water availability. This is done through UAV photography providing RGB, multispectral, hyperspectral and thermal high-resolution images. These photographs, along with field information form the basis of a GIS that allows for the generation of:

- An initial agricultural diagnosis of the project area and demonstrative units;
- Parameters to be quantified through fieldwork; and
- Elevation models, runoff profiles and soil humidity electromagnetic models of the soil in the project's development area, supported by GPS fieldwork including soil evaluation with soil pits.

This complete aerial photography mapping will be repeated at least once at the end of the project, allowing for full agronomic impact evaluation.

The exploitation of this information system allows for the adequate implementation of demonstration units, for the evaluation of vegetative cover and pastures and cultivated areas and the zoning of the project area in terms of agronomic potential, and also an evaluation of the impact of the techniques and systems provided to the beneficiaries (crops, rotation, greenhouses, livestock management systems and water harvesting systems) and, as such, of the project.

Establishing the Demonstration Units

The project will establish nine demonstration units, eight of which will be located on fields belonging to farmers from the *secano* communes (Navidad, Litueche, La Estrella, Marchigue, Pumanque, Pichilemu, Paredones, Lolol). The ninth unit will be located at the INIA experimental station, Hidango (*secano*), where more detailed evaluations will be made on the performance of the crops under different types of soil and water management.

Crops adapted for the conditions of water scarcity in the *secano* will be incorporated and evaluated:

- Wheat
- Buckwheat
- Peas
- Quinoa
- Legume and grass fodder combinations

The optimum soil management treatment for the morphology and conditions of each demonstration unit will be applied to all of these crops, and conservationist soil and water management practices will be used, such as:

- Zero tillage for cereals
- Subsoiling
- Pasture regeneration
- Stubble management
- Amendments and fertilising
- Organic and inorganic fertilisation and
- Establishing contour crops

As an option for irrigating in conditions of water shortage, drip irrigation will be incorporated, allowing for greater control of soil humidity and weeds in vegetable crops.

In addition to the above, in each of the nine demonstration units rain harvesting, storage and utilisation systems will established to provide water for animals and for vegetable production in greenhouses, along with a greenhouse where demonstrations of vegetable and green hydroponic fodder will be carried out using recirculated rainwater.

Finally, demonstration units will also have a flock of five sheep and a ram and five beehives.

Tracking and monitoring of each demonstration unit will inform the training programme aimed at *secano* farmers and specialists at local level, producing the adaptive management of both: demonstration unit and training programme.

The distribution and techniques to be demonstrated in each unit are shown in the table below.

Monitoring system

In the demonstration units, demonstration monitoring will be put in place, focusing on crop nutrition and showing plants' response to liquid and solid fertilisers (nitrogen, phosphorous, calcium and potassium), both inorganic and organic and selected for being accessible to beneficiaries and eligible for funding from the Ministry of Agriculture's degraded soils recovery programme (SIRSD). The monitoring system also measures:

- evolution of the physical, chemical and biological properties of the soil;
- results of each applied technique in the management of soil, water and yields;
- response to plagues and diseases; and
- water stress and irrigation needs, including occasional irrigation of permanent pastures.

To do this, after each season of the project, soil samples will be taken from each of the established demonstration units, which will be taken to a laboratory for the appropriate analysis to be incorporated into the GIS project. This procedure yields a constant flow of data and information which will be included in the recommendations made to *secano* farmers. The recommendations will consider farmers' eligibility for SIRSD.

This physical and agronomic monitoring of demonstration units is added to the monitoring of social and economic indicators on 558 beneficiaries of water-harvesting facilities and on whole vulnerable population in the project municipalities.

Activities and techniques in demonstrative units

Demonstration unit	Province	Municipality	Crops	Animal production	Water management techniques	Water management techniques. Irrigation	Water and soil management techniques. Crop-related	Water and soil management techniques. Soil-related	Water and soil management techniques. Pasture-related
Farmer 1 (to be selected)	Cardenal Caro	Navidad	Wheat Buckwheat Pea Quinoa Legume and grass fodder combinations Supplementary forage incorporation in winter and summer Leaf and fruit vegetables, introducing the crop-rotation concept Strawberry	Sheep Laying hens Beekeeping	Rain harvesting, storage and utilisation systems Renewable energy systems Subsoiling for easement of infiltration	Drip irrigation of vegetables under greenhouse Eventual irrigation of pastures (minispraying) Hydroponic forage production (microspraying)	Contour crops Zero tillage Stubble incorporation Amendments and fertilising Use of subsoiler and chisel plough Native tree and shrub species (*quillay* and others) under silvopastoral system	Infiltration grooves Gully control Incorporation of keyline design elements	Guano-fed pasture Regeneration of degraded pasture Subsoiling established pasture Use of electric fence Forage shrubs Green manure Incorporation of holistic-management elements
Farmer 2 (to be selected)	Cardenal Caro	Litueche							
Farmer 3 (to be selected)	Cardenal Caro	La Estrella							
Farmer 4 (to be selected)	Cardenal Caro	Marchigüe							
Farmer 5 (to be selected)	Cardenal Caro	Pichilemu							
Farmer 6 (to be selected)	Cardenal Caro	Paredones							
Farmer 7 (to be selected)	Colchagua	Lolol							
Farmer 8 (to be selected)	Colchagua	Pumanque							
INIA experimental station “Hidango”	Cardenal Caro	Litueche		Sheep					

Machinery

Agricultural equipment and machinery to be acquired by the project will be used to perform the various conservationist soil management techniques in the nine demonstration units, and to provide soil management services in the beneficiaries' fields. The beneficiaries of rainwater harvesting storage and use systems will be given priority in terms of receiving support from the machinery and equipment in work to scarify soil, apply amendments (organic, phosphate, and calcareous) and other tasks. They will be used as follows:

- *Subsoiler*: used to break soils, with vertical tillage, in each of the demonstration units. It will facilitate breaking soils compacted by the use of mouldboard and disc ploughs, as well as the trampling of grazing lands by animals.
- *Chisel plough*: vertical tillage, without disruption to the soil profile.
- *Vibrocultivator*: equipment for seedbed preparation control of vegetative propagation weeds
- *Zero tillage seed machine*: direct seeding machine that doesn't move the earth, reducing erosion by 90%.
- *Pasture regenerating machine*: allows direct seeding of pastures, without ploughing, and delivers fertilizers to soils with degraded pastures.
- *Manure spreader*: the equipment is used for applying organic amendments such as bird guano to degraded soils or pastures.
- *Tractor*: 115 hp for moving and driving farming equipment and machinery.
- *Backhoe*: Excavator necessary to move small amounts of earth in conditioning work on demonstration units.
- *Sprayer*: for the application of herbicides for weed control before using zero tillage seeder.
- *Strawberry picking assistant*
- *Stubble chipper*
- *Wheat/Quinoa seeder*: for planting demonstration units with these crops.
- *Stubble cultivator*: for the incorporation of stubble into the soil as part of soil preparation for seeding. It encourages uniform incorporation of the stubble in terms of depth which fosters decomposition.
- *Offset disc harrow*: used for secondary tasks in soil preparation, chopping, and incorporating stubble and organic, calcareous and phosphate amendments into the soil.
- *Manual hay baler*: used for baling crops or stubble of fodder species in the small-scale farming system of the project.
- *Honey extractor*: centrifuge, extracts honey from honeycombs without damaging the combs.
- *Oil tank and manual fuel pump*.
- *Flatbed wagon*: transport for input in the demonstration units.+

Works in beneficiaries' farms

As well as the work in the nine demonstration units, rainwater harvesting, storage and utilisation systems will be put in place in 558 farms, starting with collection from the roofs of farm as well as irrigation systems. buildings on the collection systems, accumulation and use of rainwater will be established after the acquisition ceiling construction of the property, as well as irrigation systems.

Water will be collected in portable 10,000 litre cisterns (100 properties) and 5400 litre tanks (the remaining farms) and 558 greenhouses will be built, each of 40m2, for the production of vegetables. The greenhouses will be installed on the properties of the famers of the most advanced level amongst the beneficiaries for the improved production of vegetables and will be shared with neighbours. Water collected in these systems will be used for vegetable and hydroponic green forage production in the greenhouses, using recirculation.

Finally, 277 honey-producing hives will be installed on the premises of those beneficiaries interested in honey production. The main piece of equipment required for this (a centrifuge) will be available for these beneficiaries at the nearest demonstration field.

Training Activities

The target audience for training activities are project beneficiaries and specialists and professionals directly linked to the project in the project area. The organised from the identification of two different target groups: project beneficiaries (farmers) and technical staff directly linked to the project and its beneficiaries and area. The training process and its results should incude beneficiaries and specialits, the latter being professionals in direct contact with beneficiaries. If these target audiences are properly incorporated by the institutions behind the project, the expected results will be achieved, and others not conceived in the process.

The project establishes a systematic, orderly, dynamic communication system, adapted to the needs and requirements of its various stakeholders and target audiences. For this, a comprehensive communication strategy is studied and adopted (at national, regional, local, and micro-local level) that considers and respects the profile of the beneficiaries. Its objectives are:

- to allow and ensure efficient and effective communication between different institutional and non-institutional actors;
- to have flexible communications whilst maintaining enough formality to allow for monitoring; and
- to establish and use channels that allow for both the dissemination of new practices and useful information and for user feedback and insights on the project.

For optimum performance, the type of information given and the existing channel are recorded, with human and material resources allocated for monitoring these communication channels and their expeditious operation. The main challenge in the communication channel is at regional and local levels, due to the institutional structures and their functional specifications. To this end, the Executive and Local Committees have been put in place, responsible for facilitating the project's impact on the daily work of specialists and beneficiaries through learning.

Direct Training of Beneficiaries

- Soil and water conservation techniques
- Visit: soil and water management under semi-arid conditions in the Brazilian North-East
- Water harvesting, storage and efficient use
- *A*dapted production of *secano* crops
- Adapted technical irrigation systems
- Technical visit: vegetable production systems using recirculation in semiarid conditions
- Adapted sheep rearing systems
- Adapted pasture management

Training of Trainers

- Characterising and classifying water sources and vegetation from drone photography
- Soil classification for the *secano* area. Agronomic studies and edaphologic classification
- Soil micromorphology studies and and cultural soil profile
- Dissemination and replication of soil and water conservation techniques

- Diploma in water harvesting and storage system design
- Regulation and maintenance of agricultural machinery
- Regulation and maintenance of tractors
- Topography
- Technical visit: water and soil management and agroclimatic risk management under semi-arid conditions
- Conservation management techniques for soils and water aimed at operators of the SIRSD programme.
- Technical visit: technical water and soil management and agroclimatic risk management in Mediterranean conditions

Dissemination Activities

As a way to begin dissemination activities, a project launch seminar will be held where the objectives and scope of the project are to be explained. Invitees will include farmers, specialists and officials from the O'Higgins Region. All government actors in the region will be included, e.g. GORE, CORE, and Agro Services.

The demonstration units for the project will be used for field days where the relevant results of evaluations for each of them will be shared with farmers and specialists from each of the communes taking part in the project. In these dissemination activities, teachers and students from schools and agricultural colleges in the region will be incorporated, as well as farmers from neighbouring regions in the second half of the project.

Radio programmes from the main radio stations in the *secano* of the O'Higgins Region will be used for widespread dissemination, where project progress and results will be shared.

During the course of the project there will be a lot of promotional material generated on the different water and soil management techniques, and crops, which will be assessed at the various demonstration units. This includes 12 informative booklets to be handed out on the field days from the second season of the project, and in various training courses aimed at small and medium farmers. Six videos on crop management and different soil and water management techniques will be distributed to regional PRODESAL and INDAP specialists as supporting material for training, dissemination and replication of the project.

In the third year of the project, 3,000 copies of a manual of best practices and lessons learned will be published, covering at least the following fields:

- Rainwater harvesting, storage and use
- Soil and water conservation techniques
- Adapted production of *secano* crops
- Adapted technical irrigation systems
- Adapted sheep rearing systems

This manual will include adapted technical items on soil and water management, nutrition and fertility of *secano* crops, disease control and an economic analysis of the proposed technologies.

Regarding the agroclimatic information system, equipment and consulting services for its technical and communicational purposes has been considered. This will facilitate useful information to be selected that can be obtained at appropriate intervals and from the optimal communication channels (radio, SMS and other).

Activity	Instructor	Target audience	Duration (days)	Course editions (number)	Participants (total)	Year 1	Year 2	Year 3	Year 4
Direct training									
Soil and water conservation techniques	INIA or project professional	Beneficiaries		8	488				
Technical visit: Soil and water management under semiarid conditions in the Brazilian North-East	EMBRAPA Semiárido, Petrolina, Pernambuco State, Brasil	6 farmers, 2 professionals	8	1	8				
Water harvesting, accumulation and efficient use	INIA or project professional	Beneficiaries		8	488				
Adapted crop management	INIA or project professional	Beneficiaries		8	488				
Adapted irrigation	INIA or project professional	Beneficiaries		8	488				
Technical visit: Vegetable production in semiarid conditions	Universidad de Córdoba, Almería, España	3 farmers, 1 professional	10	1	4				
Adapted sheep rearing	INIA or project professional	Beneficiaries		2	122				
Adapted pasture management	National consultant, INIA or project professional	Beneficiaries		2	122				
Subtotal direct training				**38**	**2.208**				
Training of trainers									
Characterising and classifying water sources and vegetation on aerial photography	National consultant	Professionals and technicians		1	13				
Soil classification	National and international consultants	Professionals and technicians		1	13				
Soil micromorphology and soil profile	International consultant	Professionals and technicians		1	13				
Diploma on water harvesting and accumulation systems	Escuela de Postgraduados, Universidad de Chapingo, México	2 project professionals	12	1	2				
Regulation and maintenance of agricultural machinery	INIA professional	Demonstrative unit staff, professionals and technicians		2	26				
Regulation and maintenance of agricultural tractors	INIA professional	Demonstrative unit staff, professionals and technicians		1	13				
Field topography	National consultant	Professionals and technicians		1	13				
Technical visit: Water and soil management and agroclimatic risk management under semiarid conditions	INTA, Salta and Santiago del Estero, Argentina	3 professionals	6	1	3				
Soil and water conservation techniques	INIA professional	SIRSD operators		3	39				
Interpreting agroclimatic indicators for decision-making	Company consultant	Project and institutions professionals and technicians, SIRSD operators		3	117				
Technical visit: Water and soil management and agroclimatic risk management in Mediterranean conditions	University of Melbourne, Australia	3 project professionals	10	1	3				
Subtotal training of trainers				**16**	**255**				
Diffusion and replication									
Field day at demonstration unit	Project professionals and technicians	Beneficiaries, local and neighbour-region producers, agricultural schools		36	3.096				
Soil and water conservation techniques	INIA professional	Neighbour-region professionals and technicians		3	39				
Subtotal diffusion and replication				**39**	**3.135**				
Total capacity building				**57**	**5.598**				

Knowledge management

Information and monitoring

A constant flow of data and information provides detailed information on the demonstration units' performance:

- evolution of the physical, chemical and biological properties of the soil;
- results of each applied technique in the management of soil, water and yields;
- response to plagues and diseases; and
- water stress and irrigation needs, including occasional irrigation of permanent pastures.

This physical and agronomic monitoring of demonstration units is added to the monitoring of:

- social and economic indicators on 558 beneficiaries of water-harvesting facilities, through yearly surveys;
- social and economic indicators on whole vulnerable population in the project municipalities (; and
- learning and appropriation monitoring done on all training participants.

The project team undertakes this task: the PTA is its general coordinator, with support provided by agricultural engineers and technicians.

Adaptive management

This set of indicators (physical, agronomic, social, and economic indicators) is analysed and put at the disposal of Local Committees along with its analysis on a yearly basis, in order to inform decisions on crops and techniques for the following and subsequent years. This information also informs project's communication.

Training

A complete set of direct-training and training-of-trainers activities is included in the project. This training programme is intended to improve the capacities of direct beneficiaries and the teams that provide them with technical assistance, including project staff, on a constant basis.

Besides, this programme, which organises and develops training and dissemination activities along the year and both for local farmers and others coming from neighbour municipalities and regions, provides opportunities for the farmers to constantly visit the demonstration units and knowing first-hand about the demonstrations being developed therein.

Training events approximately develop in the numbers shown below (see detail above), providing opportunities for farmers, professionals and visiting peers to exchange knowledge and news:

Year	1	2	3	4
Number of training and dissemination events	7	30	38	34

Communication

A specialist in rural communication is retained by the project and is part of the project management unit, in order to define, coordinate and carry out a coherent communication and diffusion strategy that includes news on training and demonstration opportunities, learnt lessons when provided by project activities and information from the agro-climatic risk management system (drought alerts, frost alerts, hydric stress alerts. Result 2.1).

The communication strategy of the project is also provided with a project webpage, a consultancy on defining appropriate communication strategies, information dissemination and training for the agro-climatic risk management system (Result 2.1), Professional communication services in order to adequately format messages to audiences, and budget for radio advertising services, found in the consultation to be the most utilised media among target population.

Dissemination and lessons learned

As already mentioned, at least 36 field days are organised in the demonstration units. These are open house days where both local and visiting farmers are provided with opportunities to see and ask about all demonstration activities in these fields, as well as receive problem-solving advice on adopted practices. At least 4 days per demonstration field are envisaged during years 2, 3 and 4, with a planned participation of 3096 persons in total. Far greater local attendance can be expected. Outreach activities in rural schools are also planned, at least 1 per year for each demonstration unit to visit local rural schools.

The project also plans for dissemination activities for the professional audience. Local professionals in charge of SIRSD and neighbour-region professionals and technicians are considered for training in soil and water conservation techniques and Interpreting agroclimatic indicators for decision-making.

As already mentioned, in the third year of the project a manual of best practices and lessons learned on soil and water management for the *secano* is to be compiled and distributed, thus codifying the experiences of the project and allowing for them to be replicated in any other *secano* area in the country.

ANNEX 3

SOCIOECONOMIC EVALUATION

Project: "Enhancing Resilience to Climate Change of the Small Agriculture in the Chilean Region of O'Higgins (Chile)"

Implementing Agency: CHILEAN INTERNATIONAL COOPERATION AGENCY (AGCI)
Executing Agencies: MINISTRIES OF AGRICULTURE AND ENVIRONMENT

2015

Socioeconomic Evaluation
Enhancing Resilience to Climate Change of the Small Agriculture In the Chilean Region of O'Higgins

I. Methodological Framework and Analytical Tools

The nature of the project - financing of infrastructure work and the acquisition of equipment to improve the competitiveness and quality of life of vulnerable micro and small farmers in the VI, or O'Higgins, Region – limits the type of analysis and appropriate tools to make a socio-economic evaluation.

Unlike most investment projects, which have well-defined units of measurement for the functions of costs and income with a common denominator of some form of money (pesos, dollars, UF, etc.), this type of project (concerned with social interests) has clear asymmetries in the units of cost and income: while expenses are expressed in monetary units, income (or benefits) have different qualitative measurement units (such as level of education and training, access to drinking water, quality of life, etc.). This implies that the usual practices for economic and financial cost-benefit analyses cannot be carried out in quantitative terms (there are no homogeneous units of measurement for costs and benefits). The costs are monetary and the benefits non-monetary.

While the traditional CBA is not practicable in cases such as this project, it is possible and usual to perform qualitative/quantitative costs and benefits analysis. The function of project costs is known *ex ante*, as are the units of measurement. The function of income (benefits) is mostly qualitative. It includes factors such as reduction of precariousness, access to basic goods such as water, training, acquiring new knowledge, increasing satisfaction and safety, etc.

An option usually used for this type of programme is to carry out cost-effectiveness analysis, either *ex ante* to assess, compare and eventually choose the lower cost alternatives to obtain the same effect or result, or *ex post*, to measure the effectiveness of interventions (programme or project). Generically, what cost-effectiveness analysis delivers is either cost/effectiveness (C/E) ratios, or effectiveness/cost ratios (E/C). Both relate economic (monetary) costs with non-monetary effects.

Conceptually, the C/E indicates the cost of a unit of the expected impact of an intervention (marginal cost) - for example, what is the monetary cost of getting one more free hour in a day - while the E/C indicates the number of units of the expected impact obtainable for every monetary unit of cost – eg how many additional free hours can be obtained for every dollar spent.

In any scenario, comparisons ex-ante that can theoretically be made between two or more programmes or interventions should meet two linking conditions,: 1) That the alternatives for intervention lead to a single result, measurable in some "natural" unit; eg number of lives saved (health), % increase in education (edu), etc., and 2) Real alternatives for possible interventions are compared based on minimum cost for the same purpose.

In the case of our project, the effect or end result of the programme is to "increase the adaptation and/or resilience to climate change." The useful indicators for measuring this increase are not precisely defined. Different ways of expressing quality of life are used, such as access to drinking water, training, access to technology, free time, but none can be used as a sole measurement for the effectiveness for the programme.

Moreover, since there are no real alternative intervention options, an *ex ante* evaluation of cost-effectiveness of the project is not feasible. At the time it would have been feasible to perform an evaluation - that is before approving the decision to implement what is already underway – it was simply not done.

Recognising the limitations imposed by these conditions on the socioeconomic analysis of the project, it is however possible to carry out a qualitative/quantitative analysis of its design and anticipated effects in order to form an objective global picture of their effectiveness.

II. Content of Qualitative/Quantitative Analysis for Project

As per that outlined in the previous section, the analysis will focus on the effects the project is expected to have, contrasted with the current situation, defined by a set of economic, social, demographic and cultural indicators.

In the first instance it will be a descriptive analysis of the overall situation today in those regions and communes covered by the project, which will serve as a reference against which to view the expected effects of the project's implementation.

II.1 Systemic Analysis and Evaluation of the Overall Situation with and without the Project

II.1.1 Analytical Description of the Overall Situation without the Project

1. Current Socioeconomic Panorama

The description and analysis will be carried out using the two central components of the project as an immediate reference, namely, **"Capacity building on appropriate farming practices in response to climate change (soil, water, livestock and crop management)"** and **"Installing an information system for agro-climatic risk management and adaptation to climate change".** This means that part of the sectorial and regional analysis will highlight the conditions in which the sector develops as a whole in the region and the country and, within this, the conditions that characterise the project's target population.

The project will be carried out in the VI Region - Libertador Bernardo O'Higgins – and focuses on all the communes of the Cardenal Caro Province (La Estrella, Litueche, Marchihue, Navidad, Paredones, Pichilemu) plus two communes from the Colchagua Province (Lolol and Pumanque).

As can be seen in Table 1, the profile of the farming community in the project area is one of great vulnerability and precariousness, probably greater than the national average.

Table 1
Social and Financial Conditions of Farmers in the Project Area by Sex

	women		men	
Characteristics	**number**	**percentage**	**number**	**percentage**
Total farmers	1562	100%	3426	100%
Connected to export market	33	2%	97	3%
Connected to agroindustry	25	2%	74	2%
Received financing (2005-2007)	201	13%	789	23%

	women		men	
Characteristics	**number**	**percentage**	**number**	**percentage**
Received other type od assistance	323	21%	938	27%
Belong to union organisation	65	4%	232	7%

Sources: CHILE_OPG ANNEX 4.1, Page 17 , cit. ODEPA, Agricultural Census 2007; Instituto Nacional de Estadísticas (INE)

The main economic activity that sustains the project's target population is small-scale agriculture, with little or no technification and a production model with virtually no added value. The very low percentage of farmers in the target population (women and men) who are linked to export markets or agribusiness is particularly telling, confirming the hypothesis that their mode of production adds very little value, leaving them marginalised from niches of the markets with better monetary returns, but with higher quality requirements, product homogeneity and higher production standards.

This scenario occurs in a context in which agricultural and forestry sector activity has the highest impact on regional GDP compared with other regions of the country. Table 2 shows the regional distribution of the incidence of the agriculture and forestry sector in each region from 2003 to 2006. It can be seen here that, of the total GDP of the national forestry and agriculture sector, the O'Higgins Region contributes most to the country, at about 20%.

Table 2
Agriculture and Forestry GDP by Region

Agriculture and Forestry GDP by Region CLP million 2003								
Region	**2003**	**Regional Dist.**	**2004**	**Regional Dist.**	**2005**	**Regional Dist.**	**2006[1]**	**Regional Dist.**
I Region: Tarapacá	11,295	0.61%	13,047	0.65%	12,433	0.57%	11,820	0.51%
II Region: Antofagasta	1,671	0.09%	1,405	0.07%	1,680	0.08%	1,779	0.08%
III Region: Atacama	37,037	2.01%	36,897	1.85%	39,829	1.83%	43,304	1.88%
IV Region: Coquimbo	94,502	5.13%	91,948	4.61%	103,860	4.77%	97,719	4.23%
V Region: Valparaíso	195,422	10.61%	204,536	10.25%	226,542	10.39%	242,991	10.53%
Metropolitan Region of Santiago	258,607	14.04%	266,871	13.38%	282,281	12.95%	289,665	12.55%
VI Region: General Bernardo O'Higgins	**379,974**	**20.62%**	**402,729**	**20.19%**	**456,952**	**20.97%**	**479,904**	**20.80%**
VII Region: Maule	263,481	14.30%	307,267	15.40%	335,100	15.37%	369,005	15.99%
VIII Region: Bíobío	279,315	15.16%	299,325	15.01%	328,400	15.07%	359,183	15.56%
IX Region: Araucanía	126,146	6.85%	134,985	6.77%	153,474	7.04%	160,220	6.94%
X Region: Los Lagos	185,182	10.05%	225,341	11.30%	228,274	10.47%	240,136	10.41%
XI Region: Aisén del Gral. Carlos Ibáñez	6,722	0.36%	6,981	0.35%	7,411	0.34%	8,034	0.35%
XII Region: Magallanes	3,077	0.17%	3,405	0.17%	3,335	0.15%	3,891	0.17%
Total silvo-agricultural	**1,842,431**	100.00%	**1,994,737**	100.00%	**2,179,570**	100.00%	**2,307,651**	100.00%

Source: developed by ODEPA with information from the Central Bank of Chile.
[1]Preliminary figures
Cited from "ESTUDIO DE FINANCIAMIENTO AGRÍCOLA; INSTRUMENTOS, COBERTURAS, INNOVACIONES Y DESAFÍOS PENDIENTES", Clarke & Asociados, July 2009

This situation is not circumstantial or temporary, as shown by the updated information in Table 2, in which the range is from 2008 to 2013. We can here see that the share of the O'Higgins region in the national

forestry and agricultural GDP, maintains a relatively similar level to previous years and, even more significantly for our analysis, the contribution of the region to national forestry and agricultural GDP remains consistently above all other regions, about six (6) percentage points above the second most important region, the eighth. What is more, although the range is too small to extrapolate trends, a tendency to further increase this gap can clearly be seen.

In sum, the data shows the considerable relative importance of the agriculture and forestry sector in the Region of O'Higgins and is therefore an indirect indicator of the relevance of the project in this region.

Table 3
Agriculture and Forestry GDP by Region
(Current pesos, 2008-2013)

año región	2008	2009	2010	2011	2012	2013
XV	20.445 ***0,8%***	24.703 ***0,9%***	22.982 ***0,8%***	27.370 ***0,8%***	27.639 ***0,8%***	32.666 ***0,9%***
I	1.834 ***0,1%***	2.166 ***0,1%***	2.078 ***0,1%***	2.204 ***0,1%***	2.279 ***0,1%***	2.245 ***0,1%***
II	4.343 ***0,2%***	5.623 ***0,2%***	5.552 ***0,2%***	5.928 ***0,2%***	5.798 ***0,2%***	5.833 ***0,2%***
III	49.010 ***1,8%***	64.782 ***2,4%***	65.806 ***2,2%***	71.735 ***2,1%***	83.336 ***2,5%***	96.152 ***2,6%***
IV	138.502 ***5,1%***	163.637 ***6,0%***	165.576 ***5,5%***	175.212 ***5,2%***	178.994 ***5,4%***	201.036 ***5,5%***
V	213.257 ***7,9%***	259.033 ***9,5%***	278.022 ***9,2%***	285.287 ***8,5%***	294.827 ***8,9%***	340.444 ***9,4%***
RMS	329.210 ***12,1%***	372.546 ***13,6%***	402.699 ***13,3%***	437.229 ***13,0%***	415.796 ***12,5%***	460.909 ***12,7%***
VI	511.884 ***18,9%***	585.490 ***21,4%***	662.158 ***21,9%***	716.591 ***21,3%***	695.122 ***20,9%***	759.107 ***20,9%***
VII	386.405 ***14,2%***	367.669 ***13,4%***	400.689 ***13,2%***	452.448 ***13,5%***	472.853 ***14,2%***	509.203 ***14,0%***
VIII	496.132 ***18,3%***	419.427 ***15,3%***	442.622 ***14,6%***	488.422 ***14,5%***	492.282 ***14,8%***	520.792 ***14,4%***
IX	230.924 ***8,5%***	196.266 ***7,2%***	217.737 ***7,2%***	256.730 ***7,6%***	249.156 ***7,5%***	263.277 ***7,3%***
XIV	132.144 ***4,9%***	110.913 ***4,0%***	144.307 ***4,8%***	169.900 ***5,1%***	164.627 ***4,9%***	174.394 ***4,8%***
X	174.342 ***6,4%***	145.400 ***5,3%***	196.488 ***6,5%***	241.924 ***7,2%***	226.166 ***6,8%***	239.617 ***6,6%***
XI	7.877 ***0,3%***	5.912 ***0,2%***	7.888 ***0,3%***	9.425 ***0,3%***	7.703 ***0,2%***	8.277 ***0,2%***
XII	15.581 ***0,6%***	15.235 ***0,6%***	15.203 ***0,5%***	17.136 ***0,5%***	13.830 ***0,4%***	14.691 ***0,4%***
Total	**2.711.891**	**2.738.801**	**3.029.808**	**3.357.540**	**3.330.408**	**3.628.642**

Source: Banco Central de Chile: PIB Regional 2008-2013

In addition, as can be seen in Table 4, the O'Higgins region itself does not fare well in comparison to national averages, which further indicates that its population or productive clusters with higher levels of vulnerability will necessarily also be more vulnerable in respect to national averages.

In this context, the choice of the project's target communes was based on the fact that they represent a concentration of one of the highest proportions of vulnerability and precariousness of a population within the region and within the country.

Table 4
Selected Socio-Demographic Indicators, Chile; O'Higgins Region

Indicator	Country*	Region**
Rural access to drinking water	90.00%	75.60%
Access to electricity	99.60%	89.90%
Poverty rate	14.40%	19.10%
Infant mortality rate	8/1000	9.8/1000

Sources: World Bank; Congress Library; INE
*:2014 data
**: data CASEN survey, 2003

These figures can be deceptive: first, they correspond to the average of indicators for the region, which is why an overestimation in values recorded for the target population can be expected; secondly, seemingly marginal variations between some values, as in the case of infant mortality, are highly significant from the perspective of international standards of health and well-being. Of the 33 communes in the O'Higgins region, it is precisely those of the coastal and adjacent *secano* areas that register the worst levels of vulnerability.

From a broader perspective, agricultural and forestry activity is known to have limited access to the formal credit system, with the exception of medium and large companies competing for credit (and getting it) in relatively similar conditions to those of other productive and service sectors.

The situation of small and micro agricultural entrepreneurs, however, as a generic group, is poor compared to their larger peers and also similar sized companies in other productive sectors. The lack of reliable expectations of operating income is one of its main drawbacks when requiring credit from the formal financial system. Just this factor, a disadvantage inherent to agriculture because of its dependence on the weather, is multiplied in the case of farmers in the communes of this project, who have the additional disadvantages relating to a poor educational profile and productive skills, as was witnessed after the participatory workshops with farmers from the nine districts (the commune of Peralillo was included in the exercise).

Table 5 and Graph 1 below, plot the conditions regarding the agriculture and forestry sector and the financial/banking system: It can be clearly seen how, over a period of nearly twenty years, loans from the financial/banking system in the agricultural and forestry sector have steadily increased in absolute terms, increasing by 15 times their value over the period; however, during the same period, the percentage share of the sector in total loans decreased steadily, from 10.3% in 1990 to only 3.8% in 2008.

In aggregate these figures indicate that although the sector has expanded over this period, its growth rate was lower than the rest of the economy. In perspective, the fact the share of the sector in loans from the financial system loans has decreased proportionally, points to a relative slowdown compared to the other sectors of the economy.

Slowdown equates closely to a lack of competitiveness in the sector, a tendency which has had long-term characteristics, from 1990 to at least 2008. More recent information, however, shows an interesting trend change, with an increment in the percentage participation of the sector in total loans.

Table 5
Loans, 1990-2008

Year	AGRICULTURE FORESTRY	FINANCIAL SYSTEM	% AGRICULTURE FORESTRY
1990	414,795	4,033,919	10.3%
1991	445,605	4,638,339	9.6%
1992	499,447	5,801,237	8.6%
1993	562,582	7,867,841	7.2%
1994	570,445	10,059,966	5.7%
1995	604,495	11,724,459	5.2%
1996	779,516	14,832,818	5.3%
1997	895,403	17,533,139	5.1%
1998	1,155,317	21,120,537	5.5%
1999	941,893	22,823,417	4.1%
2000	1,036,920	23,470,520	4.4%
2001	1,112,874	25,654,553	4.3%
2002	1,196,428	28,655,176	4.2%
2003	1,215,985	30,101,472	4.0%
2004	1,208,847	31,165,370	3.9%
2005	1,323,726	35,788,114	3.7%
2006	1,572,710	42,214,738	3.7%
2007	1,867,235	49,712,854	3.8%
2008	2,147,872	59,828,267	3.6%

Source: ODEPA with information from SBIF[6]

Of particular interest are two phenomena, however, shown in the last updates (Table 6) with data to 2014. At the macro level, there is a change in the trend from 990-2008: in 2014, sectorial total almost duplicates that of 2008, reaching 6.1% of the total. This is a clear signal that in the last years (post 2008) there has been a notable enhancement in the access conditions of the sector to formal financing, with an associated dynamisation.

On the other hand, it is especially notable that loans in O'Higgins region are porcentually the biggest by region in the country, reaching 31.3% of the total for the agriculture-forestry sector.

It is not easy to draw conclusions from these numbers. The high percentage of the region on the national sectorial total is surely related to the region's condition of biggest contributor to the national agriculture-forestry GDP. This relative growth could either indicate a dynamic sectorial environment or signals of leveraging in the sector.

Table 6. Financial institution's loans in the sector[1] (Net positions December 2014, CLP millions)[2]						
Region	Agriculture[3] and livestock	Fruticulture	Silviculture	Total agriculture and forestry	Total commercial	Participation
Arica y Parinacota	16.074	1.759	130	17.962	165.015	10,9%
Tarapacá	1.421	980	377	2.778	651.283	0,4%
Antofagasta	3.463	124	1.675	5.261	813.722	0,6%
Atacama	8.666	19.229	996	28.891	311.122	9,3%
Coquimbo	65.002	49.936	6.067	121.005	862.807	14,0%
Valparaiso	122.658	90.651	10.236	223.545	2.140.460	10,4%
Metropolitana	1.458.374	589.727	234.493	2.282.594	58.807.577	3,9%
O'Higgins	171.660	156.529	5.880	334.069	1.068.928	31,3%
Maule	227.512	174.471	29.215	431.198	1.505.901	28,6%
Biobío	190.876	25.994	81.279	298.148	2.382.332	12,5%
Araucanía	201.486	29.548	21.987	253.021	1.109.394	22,8%
Los Ríos	84.563	3.993	18.615	107.171	396.676	27,0%
Los Lagos	212.984	2.608	10.350	225.941	1.290.094	17,5%
Aysén	9.577	23	811	10.411	114.526	9,1%
Magallanes	43.996	107	1.660	45.764	363.115	12,6%
Total	2.818.312	1.145.680	423.770	4.387.761	71.982.951	6,1%

Source: ODEPA on data from SBIF.

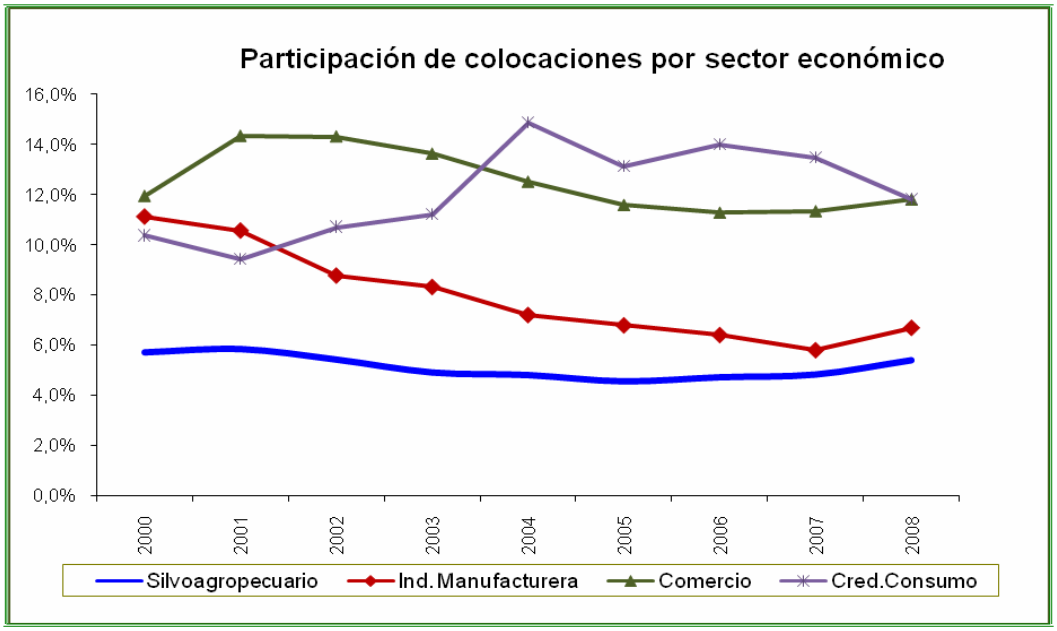
[1] Corresponds to commercial loans by banking institutions supervised by SBIF, net of contingent loans and excluding mortgages and consumer finance.

[2] Includes Chilean- and foregin-denominated loans. Foreign-denominated ones are converted at the accounting exchange rate.

[3] Excludes fruticulture.

Graph 1

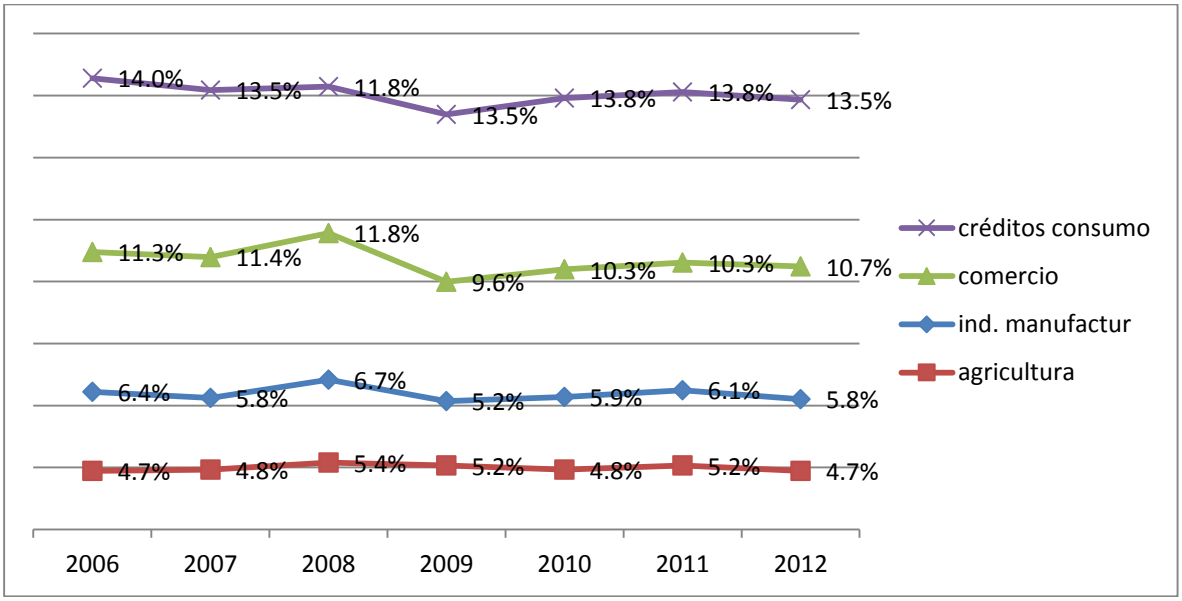
Share of loans by economic sector, 2000-2008



Source: Data from SBIF, to November each year. Cited from "ESTUDIO DE FINANCIAMIENTO AGRÍCOLA; INSTRUMENTOS, COBERTURAS, INNOVACIONES Y DESAFÍOS PENDIENTES", Clarke & Asociados, July 2009

Graph 2

Share of loans by economic sector, 2006-2012



Source: Superintendencia de Bancos e Instituciones Financieras (SBIF), 2012

The relatively low share of the agriculture and forestry sector in the financial banking system is corroborated by graph 1, which shows a low percentage share of the total loans. The greatest importance of these figures is probably that they lay bare the systemic instability in the sector vis a vis the key factor of dynamism in economic activity: the creditworthiness of those who participate in it.

Apart from vulnerability in general socio-economic terms, there are very significant vulnerabilities regarding possible climate change. Table 7 shows that with the exception of Paredones, all communes would be affected negatively.

Table 7
Expected Impact of Climate Change on the Project's 8 Communes

Municipality	Impact on the productive and social system	Economic activity
Pichilemu	negative, low	negative, low
La Estrella	negative, high	negative, moderate
Litueche	negative, moderate	negative, low
Marchigue	negative, moderate	negative, moderate
Navidad	negative, low	negative, low
Paredones	positive	positive
Lolol	negative, high	negative, high
Pumanque	negative, low	negative, low

Source: CHILE_OPG ANNEX 4.1, Page 12

In sum, without the project the scenario for the communes and target population would be to remain in the current situation of precariousness and vulnerability, including:

- Low levels of technification in production processes, with little added value
- Low socio-demographic indices, in absolute and comparative terms
- Low and/or very low sectorial dynamism, with poor levels of competitiveness
- Low possibility of diversification and/or increases in production
- Precarious access to sources of formal funding
- Difficult access to attractive market niches due to lack of competitive skills
- Little chance of improvement and overcoming systemic instability
- Low adaptation and assimilation capacity to the challenges of climate change
- Generally limited opportunities for personal development.
- Limited access to essential goods for survival (water, energy)
- Low level of well-being

II.1.2. Situation with Project. Description and analysis of changes attributable to the project in the target population, in the general population of the communes affected by the project, and in regional indicators

1. Scope of Project

The estimated total population of the O'Higgins region is between 850,000 and 870,000 inhabitants, depending on the population projection source. The direct target population of the project is 5,000 people. Including this group's respective households, the total direct and indirect population that will be benefited by the project is 10,000 people, ie about 6.2% of the total regional population under the poverty line.

Additionally, as stated in the project document[6], especially in pages 49 to 53, apart from the 558 smallholders and more than 2,200 direct beneficiaries, there will be other smallholders that will see their capacity to adapt and react to climate change. In reality, and considering their families, the total population directly and indirectly benefited from the project raises to around 40,000 people, which means 24.8% of the population under the poverty line and near the total rural population in vulnerability in O'Higgins's *secano* (estimated in some 40-44,000 people) [7].

From this perspective it is legitimate to argue that the project is focused on the nucleus of the population and communes with the greatest need for intervention to improve their precarious conditions.

Additionally, the project considers at least other 3,000 people being benefited with tech-transfer, training and learning activities, coming from neighbour holdings, municipalities and regions[8]. The population positively impacted by the project is big and relevant.

[6] CHILE_OPG ANNEX 4.1 Project Proposal

[7] Programa de Cooperación Técnica TCP/CHI/3403. Aprovechamiento de aguas y suelos en el secano de la región de bernardo o'higgins. Resumen de los mensajes claves y recomendaciones del diagnóstico. FAO working document (unpublished).

[8] Ibid., pág 31

2. Project Components and Expected Results and Products[9]

Component 1. Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock
Result 1.1. Implementation of a capacity building and training system to increase the resilience capacity of farming communities vulnerable to climate variation (soil, livestock, water and crop management)

Product 1.1.1. Creation of eight supervised training and transfer teams by INIA
Product 1.1.2. Implementation of nine demonstration fields for agro-technological transfer
Product 1.1.3. Acquisition of machinery for nine demonstration fields
Product 1.1.4. Training in sustainable land management
Product 1.1.5. Training in drought tolerant crop management
Product 1.1.6. Training in efficient water management

Result 1.2. Implementation of measures and technologies for increasing water resource availability for rural communities of the coastal and interior *secano* of the O'Higgins region

Product 1.2.7. Installation of rain harvesting equipment in 550 farms.
Product 1.2.8. Management of knowledge and exchange of good practices

Component 2. Installation of an information system for agro-climatic risk management and climate change adaptation
Result 2.1. To improve management of relevant agro-climatic information for decision-making regarding present and future climate changes among MINAGRI local professionals and rural communities

Product 2.1.1. Strengthening of the existing network of automatic weather stations
Product 2.1.2. Capacity building for the analysis of data on climate and timing and integration in agricultural decision-making.

3. Performance Indicators

In aggregate, and considering the current scenario is entirely *ex ante* regarding results, it is clear that compliance with the agenda outlined in the plan will positively affect all aspects that are at the core of the precariousness of the target population.

As stated in the conclusions and recommendations, the evaluation of the effectiveness of the proposed interventions of the project will be possible only at the end of the time considered in the project itself for its realisation and completion.

Calculations and estimations have been conducted on the efficiency and effectiveness of the project expenditure. On efficiency (at output level), calculations are the following:

[9] These data correspond literally to project content; it is cited so as to maintain the logical sequence in the analysis with and without project.

Project/Programme Components	Project design			Expected Concrete Outputs	Efficiency indicators (output level)	
	Cost (USD)	Direct beneficiaries	Indirect beneficiaries		Marginal cost (USD per direct beneficiary)	Marginal cost (USD per direct and indirect beneficiary)
Component 1.- Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock	**8603 251**	**5 598**	**21 372**		**1 537**	**319**
Result 1.1.- Implementation of capacity building and training systems	**5297 781**	**5 343**	**21 372**		**992**	**198**
	820 499	5 343	21 372	1.1.1.- Creation of training and advisory teams for agro- technology transfer	154	31
	438 131	2 208	8 832	1.1.2.- Implementation of 9 demonstration fields for agro- technology transfer	198	40
	2396 940	2 208	8 832	1.1.3.- Acquisition of agricultural machinery for the 9 demonstration fields	1 086	217
	548 504	5 343	21 372	1.1.4.- Training in sustainable soil management	103	21
	561 982	5 343	21 372	1.1.5.- Training in the use of crops, forage crops, fruit trees and livestock	105	21
	531 725	5 343	21 372	1.1.6.- Training in efficient water management	100	20
Result 1.2.- Improve the decision supporting agroclimatic information management	**3305 470**	**5 343**	**21 372**		**619**	**124**
	3167 821	558	2 232	1.2.7.- Installation of rain water and surface runoff harvesting facilities	5 677	1 135
	137 649	5 598	21 372	1.2.8.- Capacity building through knowledge sharing and good practice demonstrations	25	5
Component 2.- Installation of an information system for agro- climatic risk management and climate change adaptation.	**406 748**	**4 988**	**19 952**		**82**	**16**
Result 2.1.- Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region.	124 269	4 988	19 952	2.1.1.- Strengthening of the existing network of automatic meteorological stations (AMS) in the project area	25	5
	282 479	4 988	19 952	2.1.2.- Capacity building in weather and climate data analysis and its integration in meaningful decision-making for farm management	57	11
TOTAL, COMPONENT/RESULT/OUTPUT COST	**9009 999**	**10 331**	**41 324**		**872**	**174**

On effectiveness, as explained before, the project and project objective present relevant methodological challenges. Most of the expected results are either of difficult quantification, or qualitative in nature, or both, because of the lack of a well-developed framework for the measurement of adaptation or/and the precarious baseline conditions of the beneficiaries, that makes improvements from their present situation infinite in mathematical terms (divided by zero when attempting to construct a ratio).

On that framework, an attempt is made to dig into the specifics of climate change resilience in the project context. Based on the capitals theory, a list of needed improvements is constructed, which then serves as the framework against which project outcomes are compared. That list of resilience components, desired fields of improvement, is proposed as follows:

- Access to water (health- and basic wellbeing-related)
- Access to training and technical assistance (knowledge, includes access to EWS)
- Access to finance (not tackled) and equipment (working capital)
- Production volume and diversification
- Access to markets (social capital). Free time (wellbeing and innovation)
- Environmental externalities

A qualitative assessment of project components' contribution to these resilience factors is then attempted through consultation to agronomic experts in the *secano* area.

COMPONENT I: Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock	
COMPONENT	**ASSESSMENT**
Access to water (health- and basic wellbeing-related)	100
Access to training and technical assistance (knowledge, includes access to EWS)	100
Access to finance (not tackled) and equipment (working capital)	100
Production volume and diversification	50 - 100
Access to markets (social capital). Free time (wellbeing and innovation)	75-100
Environmental externalities	0 – 50 (+); 0 (-)

COMPONENT II: Installation of an information system for agro- climatic risk management and climate change adaptation.	
COMPONENT	**ASSESSMENT**
Access to water (health- and basic wellbeing-related)	0 - 100
Access to training and technical assistance (knowledge, includes access to EWS)	100
Access to finance (not tackled) and equipment (working capital)	100
Production volume and diversification	0 - 50
Access to markets (social capital). Free time (wellbeing and innovation)	50-100
Environmental externalities	0 – 50 (+); 0 (-)

Values of 100% correspond to areas where the project is certain to provide improvements. Values from 1 to 99% correspond to areas where improvement is uncertain, partial or qualitatively small. Values of 0% correspond to areas where there is not perceived improvement in the resilience factor.

This scheme is then used to inform the project outcomes' likelihood of providing improvements to its beneficiaries.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Effectiveness indicators (outcome level) Qualitative (contribution to factors of resilience capacity, 0-100%), expected at project end					
			Access to water. Health	Access to training and technical assistance	Access to finance and equipment	Production volume and diversification	Access to markets. Free time	Environmental positive externalities
Component 1.- Technology support and training to enhance farming practice with respect to climate threats to soil, water, crop and livestock		Increased resilience capacity of rural farmer communities to the negative impacts of climate variability and climate change.	**1**	**6**	**2**	**6**	**2**	**1**
Result 1.1.- Implementation of capacity building and training systems			**0**	**5**	**1**	**5**	**1**	**1**
	1.1.1.- Creation of training and advisory teams for agro- technology transfer		0	1	0	0,75	0	0
	1.1.2.- Implementation of 9 demonstration fields for agro- technology transfer		0	0	0	0,75	0	0
	1.1.3.- Acquisition of agricultural machinery for the 9 demonstration fields		0	1	1	0,75	0	0
	1.1.4.- Training in sustainable soil management		0	1	0	0,75	0	0,25
	1.1.5.- Training in the use of crops, forage crops, fruit trees and livestock		0	1	0	0,75	0,875	0
	1.1.6.- Training in efficient water management		0	1	0	0,75	0	0,25
Result 1.2.- Improve the decision supporting agroclimatic information management			**1**	**1**	**1**	**2**	**1**	**0**
	1.2.7.- Installation of rain water and surface runoff harvesting facilities		1	0	1	0,75	0	0
	1.2.8.- Capacity building through knowledge sharing and good practice demonstrations		0	1	0	0,75	0,875	0,25
Component 2.- Installation of an information system for agro- climatic risk management and climate change adaptation.		Improved capacity of the MINAGRI staff in the O Higgins region in agro-meteorological data collection, management, and climate risk assessment. Improved adaptive capacity to climate change of the farmer communities in the O Higgins region through agro climatic information oriented decision making. Increased agricultural production through “climate clever” decision making. This project component will serve as model for other regions.	**1**	**2**	**0**	**0,5**	**0,75**	**0**
Result 2.1.- Implementation of measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region.	2.1.1.- Strengthening of the existing network of automatic meteorological stations (AMS) in the project area		0,5	1	0	0,25	0	0
	2.1.2.- Capacity building in weather and climate data analysis and its integration in meaningful decision-making for farm management		0,5	1	0	0,25	0,75	0
PROJECT			**2**	**8**	**2**	**7**	**3**	**1**

4. Conclusions and Recommendations

a. The project will operate over a universe of eight communes in the O'Higgins region, covering 9 demonstration fields, 558 vulnerables farmholdings and more than 5,000 farmers, directly affecting a total of more than 10,000 people and indirectly supporting some 40,000. That accounts for 100% of the small-farmer population of the 8 municipalities and around 24.8% of the population under the poverty line in the O'Higgins region. Additionally there will be an undetermined number of other indirect benefits and enhanced production chains. We can reasonably assume this, though it cannot be easily identified and/or quantified.

b. The expected effects of the project will be reflected in a number of positive changes in conditions and attribute for the target population, among which are the following, directly related to the project's components, products and results:

- Access to drinking water
- Farming practices
- Health
- Education and training
- Institutional technical support
- Funding
- Equipment and/or tools
- Production volume
- Increase in, and diversification of, production
- Strengthening and/or creation of production chains
- Free time
- Well-being

c. The challenge of defining a set of reliable objective indicators for this analysis escapes the scope of this evaluation. Subjective indicators (surveys of beneficiaries) are feasible and recommended as a cost-effective way of measuring the improvements in resilience of the beneficiary population.

d. It is recommended that the technical work of proposing, developing and agreeing on a set of indicators to assess the effectiveness of "adaptation and resilience to climate change" is carried out as soon as possible. This is considered a need in order to properly assessing the achievements of this project (and other similar ones with identical methodological limitations)

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JVG, August 2015

ANNEX 4

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Specific impacts for attention	Probability of impacts /description	Significance of impacts	Likely affected population /natural resources /economic effects	Preventive actions and mitigation measures	Monitoring
Environmental and Social Principles					
Compliance with the Law	Very low	Medium	Project beneficiaries	Chile is one of the more transparent and open developing countries. No additional measures beyond (stringent) controls set up for government operation	Procedures for all project activity must be in compliance with the law Means of verification: annual project audit
Access and Equity	Positive	High	Poor and marginalised rural population in project area	The project has been duly publicised in the rural areas in project municipalities, and participation in project meetings and screening facilitated. Participation is voluntary. Project beneficiaries must belong within the top of the vulnerability scale in project area. No additional measures beyond controls set up for government operation	Project beneficiaries must belong within the top of the vulnerability scale in project area Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)
Marginalized and Vulnerable Groups	Positive	High	Poor and marginalised rural population in project area	The project provides benefits to the most marginalised population in project area: poor rural households at the top of the vulnerability scale. Project beneficiaries must belong within the top of the vulnerability scale in project area. No additional measures beyond (stringent) controls set up for government operation	Project beneficiaries must belong within the top of the vulnerability scale in project area Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)
Human Rights	None	-	-	Chile is a democratic country with a recent history that makes the country specially sensitive to human rights issues. No additional measures	-

Specific impacts for attention	Probability of impacts /description	Significance of impacts	Likely affected population /natural resources /economic effects	Preventive actions and mitigation measures	Monitoring
Gender Equity and Women's Empowerment	Positive	Medium	Poor and marginalised rural women in project area	The project provides benefits to the most marginalised population in project area: poor rural households at the top of the vulnerability scale. Positive discrimination has been applied in the selection of direct beneficiaries. Beneficiaries in 1.2.7 must be at least 57% women. Women participation in capacity development activities must keep at least the 31% in target population	Beneficiaries in 1.2.7 must be at least 57% women. Women participation in capacity development activities must keep at least the 31% in target population Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)
Core Labour Rights	None	-	-	Participation is voluntary and all activities except training are provided to beneficiaries in their own holding and free of charge. No additional measures	-
Indigenous Peoples	None	-	-	No relevant indigenous population in project area. No additional measures	-
Involuntary Resettlement	None	-	-	No resettlement whatsoever is planned. No additional measures	-
Protection of Natural Habitats	None	-	-	No new agricultural area to be established with project support. No non-renewable natural resources to be tackled. No likely impact on natural habitats planned. No additional measures	-
Conservation of Biological Diversity	Very low	Low	Rural population in project area	Project impact in this field must be positive in fact, given the promotion of practices friendlier to the environment that must result in a diminishment of agrochemicals being used in the area. Given the relative insignificance of the target population in terms of production volume, this positive impact must be considered marginal. Area survey to be monitored through project's GIS	Area survey to be monitored through project's GIS (see CDKM Plan) Means of verification: Independent Interim Evaluation (IIE), Independent Final Evaluation (IFE)

Specific impacts for attention	Probability of impacts /description	Significance of impacts	Likely affected population /natural resources /economic effects	Preventive actions and mitigation measures	Monitoring
Climate Change	None	-	-	Project impact in this field must be positive in fact, given the promotion of practices friendlier to the environment that must result in a diminishment of GHG being released in the area. Given the relative insignificance of the target population in terms of production volume, this positive impact must be considered marginal. No additional measures	-
Pollution Prevention and Resource Efficiency	None	-	-	Project impact in this field must be positive in fact, given the promotion of practices friendlier to the environment and more efficient in terms of resource use that must result in a diminishment of energy spent per production unit. Given the relative insignificance of the target population in terms of production volume, this positive impact must be considered marginal. No additional measures	-
Public Health	Positive	Medium	Project beneficiaries	Participation in the project should result in the target population's wellbeing being enhanced. Questions on health to be included in the yearly beneficiary survey	Questions on health to be included in the yearly beneficiary survey Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)
Physical and Cultural Heritage	Positive	Medium	Rural population in project area	Questions on physical and cultural heritage to be included in the yearly beneficiary survey	Questions on physical and cultural heritage to be included in the yearly beneficiary survey Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)
Lands and Soil Conservation	Positive	Medium	Poor and marginalised rural population in project area	Given the relative insignificance of the target population in terms of held area, this positive impact must be considered marginal	Area survey and soil quality indicators to be monitored through project's GIS Means of verification: Independent Interim Evaluation (IIE), Independent Final Evaluation (IFE)
Residual risks in PRF					

Specific impacts for attention	Probability of impacts /description	Significance of impacts	Likely affected population /natural resources /economic effects	Preventive actions and mitigation measures	Monitoring
Assumption: the exchange rate CLP/USD remains over 550	Very low	Medium	Project beneficiaries	AGCI is to keep the project Steering Committee informed on exchange rate projections. If needed, major adjustments should be made at the Independent Interim Evaluation (IIE)	AGCI is to keep the project Steering Committee informed on exchange rate projections Means of verification: Independent Interim Evaluation (IIE), Independent Final Evaluation (IFE)
Risk: climate change is more intense than projected by analyses and studies	Low	Medium	Project beneficiaries	The MMA is to keep the project Steering Committee informed on updates in climate change projections. If needed, major adjustments should be made at the Independent Interim Evaluation (IIE)	The MMA is to keep the project Steering Committee informed on updates in climate change projections Means of verification: Independent Interim Evaluation (IIE), Independent Final Evaluation (IFE)
Risk: the government or the institutions do not assign sufficient priority to the programme	Very low	Medium	Project beneficiaries	Direction of the project is to be established in the SEREMI of Agriculture of the O'Higgins region in prevention of this risk	Direction of the project is established in the SEREMI of Agriculture of the O'Higgins region Means of verification: Independent Interim Evaluation (IIE), Independent Final Evaluation (IFE)
Risk: beneficiaries lack of incentive or financial capacity to invest in restoration or improvements can lead to ineffective results in land use and other expected results	Low	Low	Project beneficiaries	Needed equipment and capacities are provided to beneficiaries in the form of training (more than 2000 most-in-need beneficiaries), as a donation (558 most-in-need beneficiaries) or as shared pool (in the case of machinery for more than 2000 most-in-need beneficiaries). Permanent contact is kept with them that provides means for detecting any problem in this sense so as to provide additional support if a farmer lags behind	Questions on adoption and remaining barriers to be included in the yearly beneficiary survey Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)

Specific impacts for attention	Probability of impacts /description	Significance of impacts	Likely affected population /natural resources /economic effects	Preventive actions and mitigation measures	Monitoring
Risk: the beneficiaries are resistant to changes in practices	Very low	Medium	Project beneficiaries	Permanent contact is kept with project beneficiaries that provides means for detecting any problem in this sense so as to provide additional support if a farmer lags behind	Questions on adoption and remaining barriers to be included in the yearly beneficiary survey Means of verification: yearly beneficiary survey, Annual Management Reports (AMR)

ANNEX 5

LIST OF TABLES FOR REPORTING ADAPTATION FUND CORE IMPACT INDICATORS

Adaptation Fund Core Impact Indicator "Number of Beneficiaries"				
Date of Report	September 23, 2015			
Project Title	**Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**			
Country	**CHILE**			
Implementing Agency	**AGENCIA DE COOPERACIÓN INTERNACIONAL – AGCI (NIE)**			
Project Duration	**48 months**			
	Baseline *(absolute number)*	Target at project approval *(absolute number)*	Adjusted target first year of implementation *(absolute number)*	Actual at completion[10] *(absolute number)*

[10] At project completion, the proponent could report on % targeted population reached or successfully supported (the absolute numbers could then be deduced from that figure)

Direct beneficiaries supported by the project	- 4988 vulnerable farmers, 8 municipalities - 5767 farmers in total, 8 municipalities (includes the former) - 17922 vulnerable farmers in O'Higgins region (includes the former) - 73205 vulnerable farmers in O'Higgins, Coquimbo, Valparaiso and Maule regions (includes the former)	Result 1.1 - 2.208 households trained and with access to machinery pools - 5343 (other) farmers trained Result 1.2 - 558 households (included in 2208 above) trained and with water harvesting capabilities Results 1.2 and 2.1 (EWS) - At least 5767 farmers (100% of farmer population in 8 municipalities) with reduced risk for extreme weather events (EWS 0 --> 3)		
Female direct beneficiaries	- 1562 vulnerable farmer women, 8 municipalities - 1806 farmer women in total, 8 municipalities (includes the former) - 5600 vulnerable farmer women in O'Higgins region (includes the former) - 22900 vulnerable farmer women in O'Higgins, Coquimbo, Valparaiso and Maule regions (includes the former)	Result 1.1 - 691 women trained and with access to machinery pools - 1673 (other) women trained Result 1.2 - 318 women (included in 691 above) trained and with water harvesting capabilities Results 1.2 and 2.1 (EWS) - At least 1806 women (100% of women farmer population in 8 municipalities) with reduced risk for extreme weather events (EWS 0 --> 3)		
Youth direct beneficiaries				

Indirect beneficiaries supported by the project	(farmer to household relation is 5 in rural Chile) - 25000 vulnerable people in farms, 8 municipalities - 28000 people in farms, 8 municipalities (includes the former) - 89000 vulnerable people in farms in O'Higgins region (includes the former) - 365000 vulnerable people in farms in O'Higgins, Coquimbo, Valparaiso and Maule regions (includes the former)			
Female indirect beneficiaries				
Youth indirect beneficiaries				

Adaptation Fund Core Impact Indicator "Early Warning Systems"				
Date of Report	September 23, 2015			
Project Title	**Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**			
Country	**CHILE**			
Implementing Agency	**AGENCIA DE COOPERACIÓN INTERNACIONAL – AGCI (NIE)**			
Project Duration	**48 months**			
	Baseline	Target at project approval	Adjusted target first year of implement ation	Actual at completion
Adopted Early Warning Systems *(Category targeted – 1, 2, 3, 4; and absolute number)* *(1) risk knowledge,* *(2) monitoring and warning service,* *(3) dissemination and communication,* *(4) response capability.* *(report for each project component)*	5767 farmers (100% of farmer population in 8 municipalities) have no access to actionable drought information	Results 1.2 and 2.1 At least 5767 farmers (100% of farmer population in 8 municipalities) with reduced risk for extreme weather events (EWS 0 --> 3)		
Hazard *(select from the list on page 2)* *(report for each project component)*	Droughts, desertification			
Geographical coverage *(km2)* *(report for each project component)*	420088 ha			
Number of municipalities *(number)* *(report for each project component)*	8			

Adaptation Fund Core Impact Indicator "Assets Produced, Developed, Improved, or Strengthened"				
Date of Report	September 23, 2015			
Project Title	**Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**			
Country	**CHILE**			
Implementing Agency	**AGENCIA DE COOPERACIÓN INTERNACIONAL – AGCI (NIE)**			
Project Duration	**48 months**			
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Sector (identify)				
Targeted Asset 1) Health and Social Infrastructure *(developed/improved)* 2) Physical asset *(produced/improved/strengthened)*				
Changes in Asset *(Quantitative or qualitative depending on the asset)*				

Adaptation Fund Impact Indicator "Increased income, or avoided decrease in income"				
Date of Report	September 23, 2015			
Project Title	**Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**			
Country	**CHILE**			
Implementing Agency	**AGENCIA DE COOPERACIÓN INTERNACIONAL – AGCI (NIE)**			
Project Duration	**48 months**			
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Income Source[11] *(name)* **Income Source**	Agriculture and livestock breeding			
Income level *(USD)*	67% of 4988 vulnerable farmers report income under 2200 USD/year, while the remaining 33% report income under 6500 USD/year	Household income increased in at least USD 1000/year·household		
Number of households *(total number in the project area)* *(report for each project component)*	- 4988 vulnerable farmers, 8 municipalities - 5767 farmers in total, 8 municipalities (includes the former) - 17922 vulnerable farmers in O'Higgins region (includes the former) - 73205 vulnerable farmers in O'Higgins, Coquimbo, Valparaiso and Maule regions (includes the former)	Result 1.1 - 2208 households trained and with access to machinery pools - 5343 (other) farmers trained Result 1.2 - 558 households (included in 2.208 above) trained and with water harvesting capabilities		

[11] When the numbers of livelihoods go through significant changes, such as when sources of income are diversified, it may be useful to illustrate the changes by primary livelihoods.

Adaptation Fund Core Impact Indicator "Natural Assets Protected or Rehabilitated"				
Date of Report	September 23, 2015			
Project Title	**Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**			
Country	**CHILE**			
Implementing Agency	**AGENCIA DE COOPERACIÓN INTERNACIONAL – AGCI (NIE)**			
Project Duration	**48 months**			
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion[12]
Natural Asset or Ecosystem *(type)*	Agricultural soils			
Change in state *Ha or km Protected/rehabilitated, or Effectiveness of protection/rehabilitation - Scale (1-5)*	6001 ha of crops and 1091 ha of pastures (in 4988 vulnerable farms in 8 municipalities) are cultivated with no regard for long-term soil quality	At least 5000 ha with improved soil quality (1 --> 4)		
Total number of natural assets or ecosystems protected/rehabilitated				

[12] At project completion, the proponent could report on % targeted population reached or successfully supported (the absolute numbers could then be deduced from that figure)