ADAPTATION FUND

AFB/PPRC.15/5
25 September 2014

Adaptation Fund Board
Project and Programme Review Committee
Fifteenth meeting
Bonn, Germany, 7-8 October 2014

Agenda Item 6 a)

PROPOSAL FOR CHILE

Background

1. The Operational Policies and Guidelines (OPG) for Parties to Access Resources from the Adaptation Fund (the Fund), adopted by the Adaptation Fund Board (the Board), state in paragraph 45 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the endorsement of the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would ultimately require the Board's approval.

2. The Templates approved by the Board (OPG, Annex 4) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

> *For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.*

3. The first four criteria mentioned above are:
   1. Country Eligibility,
   2. Project Eligibility,
   3. Resource Availability, and
   4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
   5. Implementation Arrangements.

5. It is worth noting that since the twenty-second Board meeting, the Environmental and Social (E&S) Policy of the Fund was approved and consequently compliance with the Policy has been included in the review criteria both for concept documents and fully-developed project documents. The proposals template was revised as well, to include sections requesting demonstration of compliance of the project/programme with the E&S Policy.

6. In its seventeenth meeting, the Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", which further outlines applicable review criteria for both concepts and fully-developed proposals. The latest version of this document was launched in conjunction with the revision of the Operational Policies and Guidelines in November 2013.

7. Based on the Board Decision B.9/2, the first call for project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Fund was sent out on 8 April 2010.

8. According to the Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

9. The following fully-developed project document titled “Enhancing resilience to climate change of the small agriculture in the Chilean region of O’Higgins” was submitted by the Agencia de Cooperación Internacional de Chile (AGCI), which is the National Implementing Entity of the Adaptation Fund for Chile. This is the second submission of the proposal, using the two-step approval process. It was first submitted as a project concept to the twenty-second meeting of the Board, and the Board decided to:

> *(a) Not endorse the project concept, as supplemented by the clarification response provided by the Agencia de Cooperación Internacional (AGCI) to the request made by the technical review;*
>
> *(b) Suggest that AGCI reformulates the proposal taking into account the observations in the review sheet annexed to the notification of the Board’s decision, as well as the following issues:*
>
> *(i) The proposal should clearly articulate the expected climate change effects on rural farm communities in the O’Higgins region of Chile with respect to current climate variability and future climate change, in order that the appropriateness of the proposed adaptation measures can be assessed;*
>
> *(ii) The proposal should describe how the proposed activities will deliver concrete adaptation benefits to smallholder and subsistence farmers to reduce their vulnerability to climate variability and climate change;*
>
> *(iii) The proposal should explain how the project intends to collect, analyse and disseminate climatic information that will be directly relevant to smallholder and subsistence farmers in a timely and appropriate manner;*
>
> *(iv) The proposal should discuss how the maintenance and support of the proposed activities has been considered, with a view to ensuring the long-term sustainability of the outcomes achieved through the project;*
>
> *(v) The proposal should reduce the requested Implementing Entity management fee to be within the cap of 8.5 per cent, as well as ensure the requested total financing is reported consistently throughout.*
>
> *(c) Not to approve the Project Formulation Grant of US$ 30,000; and*
>
> *(d) Request AGCI to transmit the observations referred to in sub-paragraph (b) to the Government of Chile.*
>
> *(Decision B.22/4)*

10. The current submission was received by the secretariat in time to be considered in the twenty-fourth Board meeting. The secretariat carried out a technical review of the project

proposal, with the diary number CHL/NIE/Agri/2013/1, and completed a review sheet. In accordance with a request to the secretariat made by the Board in its tenth meeting, the secretariat shared this review sheet with AGCI, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

11. The secretariat is submitting to the PPRC the summary and, pursuant to Decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section.

Project Summary

Chile – Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins

Implementing Entity: AGCI
Project/Programme Execution Cost: USD 450,000
Total Project/Programme Cost: USD 9,460,000
Implementing Fee: USD 500,000
Financing Requested: USD 9,960,000

Programme Background and Context:

Chile is 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. The main objective of the proposed project is to increase the resilience of rural farm communities in the coastal and inner dry lands of the O´Higgins region with respect to current climate variation and future climate changes. The specific objectives include: incrementing resilience of farm communities vulnerable to climate variation and climate change by implementing capacity building and conducting training on cattle, crop, water and soil management; improving agroclimatic information management by local MINAGRI professionals and farmer communities; and increasing water resources availability for rural communities through measures and technologies.

Component 1: Capacity building in climate variability and climate change related appropriate farming practices with respect to soil, livestock, water and crop management (USD 8,710,000)

Through this component, the rural farmers communities are expected to increase their resilience capacity to the negative impacts of climate variability and climate change through: (i) enhancement of abilities in soil, livestock, water and crop management; (ii) access to an agricultural machinery pool for soil management; and (iii) increase of water availability and crop productivity in 550 farm holds in the project area. The agro-technology transfer concept of the project consists of a combination of "learning by doing" and "learning by seeing", where the farmers together with the local training and advisory teams will generate the expected concrete outputs. The project aims to establish 9 demonstration fields including its infrastructure and equipment (fencing, water troughs, electrical power supply, etc.) to demonstrate appropriate farm management for climate adaptation and resilience building.

Component 2: Installation of an information system for agro-climatic risk management and climate change adaptation (USD 300,000)

The main goal of this component is to strengthen the National Agro-Climatic Network (RAN) in the project region, to improve its products and to make them available on a regular basis for the farmer population for climate hazards and climate change related decision making. In this context, the project will acquire and install 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 component will also build capacity in weather and climate data analysis and develop farm management indicators.

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Project Concept

Country/Region: **Chile**
Project Title: **Enhancing resilience to climate change of the small agriculture in the Chilean region of O'Higgins**
AF Project ID: **CHL/NIE/Agri/2013/1**
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): **9,960,000**
Reviewer and contact person: **Daniel Gallagher**
Co-reviewer(s): **Mikko Ollikainen**
IE Contact Person: **Enrique O'Farrill-Julien**

Review Criteria	Questions	Comments 14 Aug 2014	Comments 12 Sept 2014
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes, Chile is vulnerable to climate change with respect to its low-elevation coastal areas, arid areas, afforested areas and areas exposed to deforestation and fragile ecosystems in the Andean and coastal regions.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes	

	2. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	The proposed project aims to address the climate adaptation needs of rural smallholder farming communities. The approach is to pilot demonstration sites for agro-technology transfer, improve water availability on farm and improve meteorological information for decision-making. In principle, the project has potential to increase the adaptive capacity of the target communities to the effects of climate change, but some clarifications is required. **CR1**: Whilst the emphasis on tangible outcomes is clear, please clarify how the US$ 2.8 million investment in agricultural machinery will enhance the adaptive capacity of farmer communities to water shortages and other climate impacts.	**CR1**: Addressed. Clarification provided on the deployment of machinery for agricultural and water-related adaptation activities, page 25-29.
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy of the Fund?	Yes, the project activities are expected to provide multi-dimensional benefits to vulnerable groups.	

	4. Is the project / programme cost effective?	Yes, cost effectiveness has been considered in the Chilean context. While a detailed budget is not required from a concept, from the project components and financing table (pp. 18-23) it is not clear what the allocation for outputs 1.4 and 1.5 is. **CR2:** Please explain and justify the budgets of outputs 1.4 and 1.5, linking the training provided to the approximate number of people to be trained and the type of training.	**CR2:** Partially addressed. Information is provided on training activities but the budget allocation for activity 1.4 remains unclear. This should be addressed in the full proposal.
	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	Yes, consistent with the relevant strategies and plans.	
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Yes, national standards are expected to be met by the project, which does not require a declaration of environmental impact under Chilean law.	

	7. Is there duplication of project / programme with other funding sources?	**CR3**: Please provide a brief discussion on the aspects of related initiatives that have been taken into account in the formulation of the present proposal, and describe how this proposal will avoid overlap with such initiatives.	**CR3:** Addressed. The present proposal builds on relevant existing initiatives, at a larger scale, and in a holistic manner combining practical measures with capacity building (page 36).
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes, knowledge management is a key sub-component, using a 'learning by seeing' and 'learning by doing' model to transfer information from the project area to 3,000 other farmers, and using international learning mechanisms. An on-going monitoring system will allow the project management team to receive feedback during implementation and apply corrective measures as needed.	
	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?	Yes, an initial consultation process has taken place. It is expected that wider consultation with target farmer communities and all relevant stakeholders will be undertaken for the fully developed proposal.	
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes	
	11. Is the project / program aligned with AF's results framework?	Yes	
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	**CR4:** It remains unclear how the sustainability of some measures has been considered, e.g. rainwater harvesting. What is the expected lifespan of such infrastructure and how is it	**CR4:** Addressed. The lifespan of the installed infrastructure is minimum 15 years and it has been tested in the regional context. Maintenance has

		expected to be maintained? Has it been tried and tested in the rural farm context in Chile or elsewhere, and what were the lessons learned from these schemes? Has renewable energy been tried and tested to power these, and how is this a socially and technologically appropriate measure? The proposal should address these issues, among others in a holistic manner, to demonstrate the sustainability of activities relating to rainwater harvesting. **CR5**: Much of the project's success will relate to the degree that the adaptation measures are scaled up to other farms beyond the 9 demonstration sites and sustained in the long-term. What is the expected scale that the direct project benefits will reach and over what timespan? What measures will the project put in place to ensure that communities who do not benefit directly from the project have the opportunity to benefit in the long-run? Please explain whether financial mechanisms such as microfinance would be available for farmers from the project or other sources, to make investments during and after the project.	been considered and the use of small-scale renewable energies for irrigation has been justified against alternatives. The proposed use of such technologies should be further elaborated at the full-proposal stage. **CR5:** Addressed. The indirect benefits of the project are expected to reach a further 3,000 small-scale farmers in the nearby regions and efforts are made to diffuse technology transfer and capacity building through a programmatic approach integrated with existing programmes underway and led by the Ministry of Agriculture. A contract will be signed between the project and relevant institutions for this purpose. Further, economic instruments will be directed by the Ministry towards farmers not benefiting directly from this project to replicate its benefits.
	13. Does the project / programme provide an overview of	Yes, the proposal has been categorized as Category C, stating	

	environmental and social impacts / risks identified?	no expected adverse environmental/social impacts. The information currently presented in the concept does not reveal any evident areas where further assessment would be needed.	
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes, fee is at 5.3 per cent	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes, fee is at 4.8 per cent	
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management?	N/A	
	2. Are there measures for financial and project/programme risk management?	N/A	
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy of the Fund?	N/A	

	4. Is a budget on the Implementing Entity Management Fee use included?	N/A	
	5. Is an explanation and a breakdown of the execution costs included?	N/A	
	6. Is a detailed budget including budget notes included?	N/A	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	N/A	
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	N/A	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	N/A	
	10. Is a disbursement schedule with time-bound milestones included?	N/A	

Technical Summary	The main objective of this proposed project is to increase the resilience of rural farm communities in the coastal and inner dry lands of the O´Higgins region in Chile with respect to actual climate variation and future climate changes. To achieve this, the project would implement capacity building and training systems to increment the resilience of farm communities that are vulnerable to climate variation and climate change with respect to cattle, crop, water and soil management. The project would also seek to improve the decision-supporting agroclimatic

	information management for current and future climate changes for local MINAGRI professionals and farmer communities. It would also implement measures and technologies for increasing water resources availability for rural communities in the coastal and inner dry lands of the O´Higgins region. The initial technical review found that the proposed project has potential to address the climate adaptation needs of rural smallholder farming communities. The approach to pilot demonstration sites for agro-technology transfer, improve water availability on farm and improve meteorological information for decision-making demonstrates a well-developed and comprehensive plan to increase the adaptive capacity of target communities. The following four areas of clarification were requested: **CR1**: Whilst the emphasis on tangible outcomes is clear, please clarify how the US$ 2.8 million investment in agricultural machinery will enhance the adaptive capacity of farmer communities to water shortages and other climate impacts. **CR2**: Please provide a brief discussion on the aspects of related initiatives that have been taken into account in the formulation of the present proposal, and describe how this proposal will avoid overlap with such initiatives. **CR3:** It remains unclear how the sustainability of some measures has been considered, e.g. rainwater harvesting. What is the expected lifespan of such infrastructure and how is it expected to be maintained? Has it been tried and tested in the rural farm context in Chile or elsewhere, and what were the lessons learned from these schemes? Has renewable energy been tried and tested to power these, and how is this a socially and technologically appropriate measure? The proposal should address these issues, among others in a holistic manner, to demonstrate the sustainability of activities relating to rainwater harvesting. **CR4**: Much of the project's success will relate to the degree that the adaptation measures are scaled up to other farms beyond the 9 demonstration sites and sustained in the long-term. What is the expected scale that the direct project benefits will reach and over what time scale? What measures will the project put in place to ensure that communities who do not benefit directly from the project have the opportunity to benefit in the long-run? The final technical review finds that the revised proposal submitted by AGCI has adequately addressed the requests for clarification sought by the secretariat at the concept stage.
Date:	**12 September 2014**

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

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	Chilean International Cooperation Agency
DGA	Dirección General de Aguas	General Directorate of Water
CIREN	Centro de Información de Recursos Naturales	Natural Resources Information Center
CNR	Comisión Nacional de Riego	National Commission for Irrigation
CONAF	Corporación Nacional Forestal	National Forestry Corporation
CONAMA	Comisión Nacional del Medio Ambiente	National Commission for Environment
ECLAC	Latin America and the Caribbean Commission	Comisión Económica para América Latina y El Caribe
ENSO	El Niño Southern Oscillation	El Niño Oscilación Sur
FAO	Food and Agriculture Organization	Organización de las Naciones Unidad para la Alimentación y la Agricultura
FIA	Fundación para la Innovación Agraria	Fundation for Agricultural Innovation
INDAP	Instituto de Desarrollo Agropecuario	Institute for Agriculture Development
INIA	Instituto de Investigaciones Agropecuarias	Agriculture Research Institute
INE	Instituto Nacional de Estadísticas	National Institute of Statistics
IPCC	Intergovernmental Panel on Climate Change	Panel Intergubernamental de Cambio Climático
MIDEPLAN	Ministerio de Planificación (Hoy Ministerio de Desarrollo Social)	Ministry of Planning
MINAGRI	Ministerio de Agricultura	Ministry of Agriculture
MMA	Ministerio del Medio Ambiente	Ministry of Environment
ODEPA	Oficina de Estudios y Políticas Agrarias	Agricultural Policies and Studies Office
PNUD	Programa de las Naciones Unidas para el Desarrollo	United Nations Development Program
SAG	Servicio Agrícola y Ganadero	Agriculture and Livestock Service
UNFCCC	United Nations Framework Convention on Climate Change	Convención Marco de las Naciones Unidas sobre Cambio Climático.

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**:** **MINISTRIES OF AGRICULTURE AND ENVIRONMENT**
Amount of Financing Requested: **9,960,000** (in U.S Dollars Equivalent)

Project / Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

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 kilometres of coastline.

In general terms, Chile has a temperate climate. Due to some variations caused mainly by differences in latitude and altitude, it give 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 has to be 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 acts 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 seasonality for both the sheep and bovine cattle production is expected to change, depending on the geographical area. On the other hand, forestall plantation production of Pinus radiata, is projected to decrease in the northern and central areas and to improve its potential of production from the Araucanía Region to the southern areas of the country.

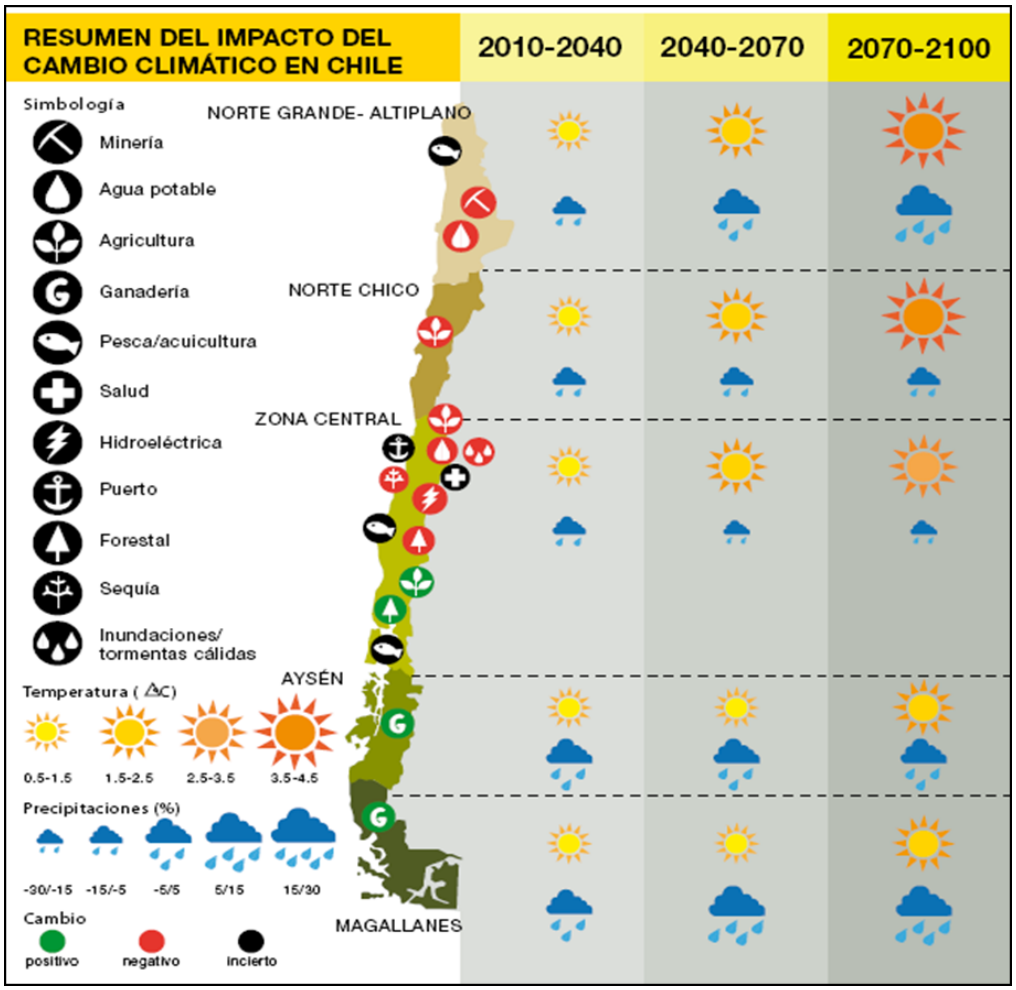

Fig. 1: Summary of climate change impacts on Chile for the period 2010-2100. Second national communication to the United Nations Framework Convention on Climate Change (2011)

Positive Negative Uncertain

Agricultural groups and regions most vulnerable to climate change

It is especially the central part of Chile (29 deg. SL-34 deg.SL) , in which most of the population is living, where adaptation actions are needed to avoid or minimize negative climate impacts which threatens agriculture productivity and livelihood at both ends of the socioeconomic scale.

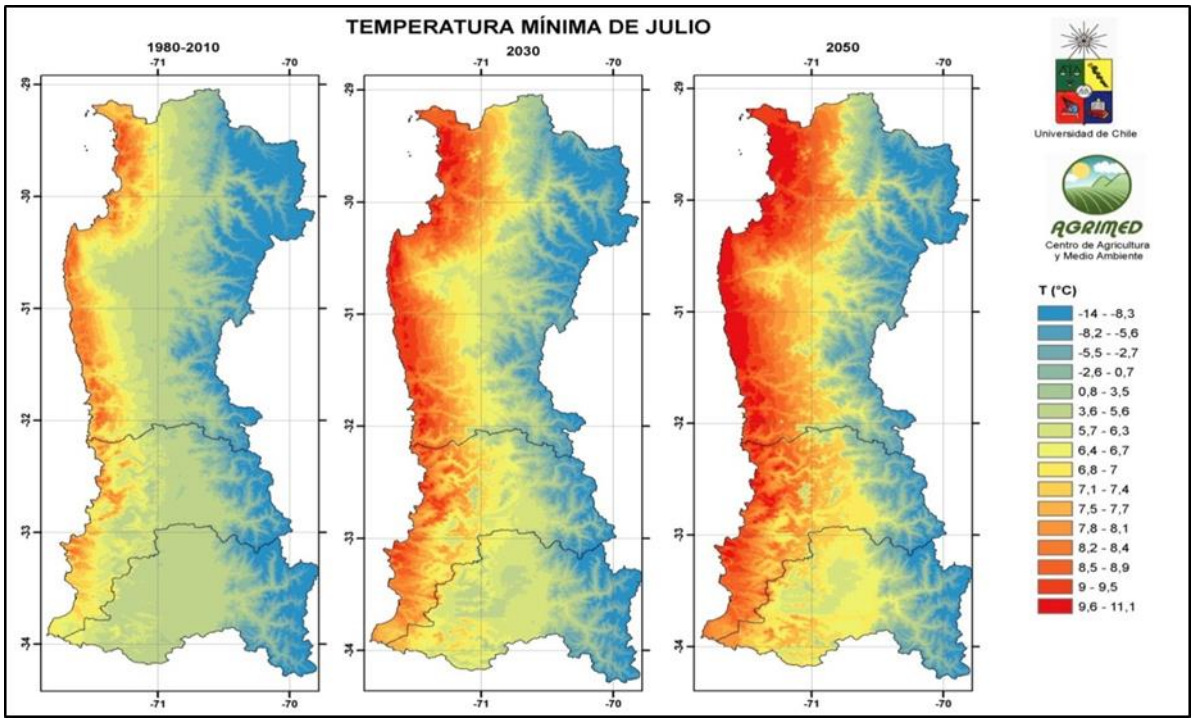

Fig 2: Projections of changes in minimum temperature (during July) and annual precipitation for central Chile; AGRIMED (2013)

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

[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), 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.

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.

N°	Farmer communities or locations	Soil erosion	Water shortage drylands	Water shortage irrigated	Plagues, diseases	Crop develop ment	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,VIII **	5	5	0	4	4	2	**20**
8	Drylands; regions V,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,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 Fireland	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 findings before mentioned 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 centre of Chile has been chosen for the implementation of the adaptations 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 to export oriented ones. The Ministry of Agriculture counts in this region with a network of services and already established activities related to capacity building, agro- technology transfer and to 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 to a management, evaluation and monitoring appropriate environment.

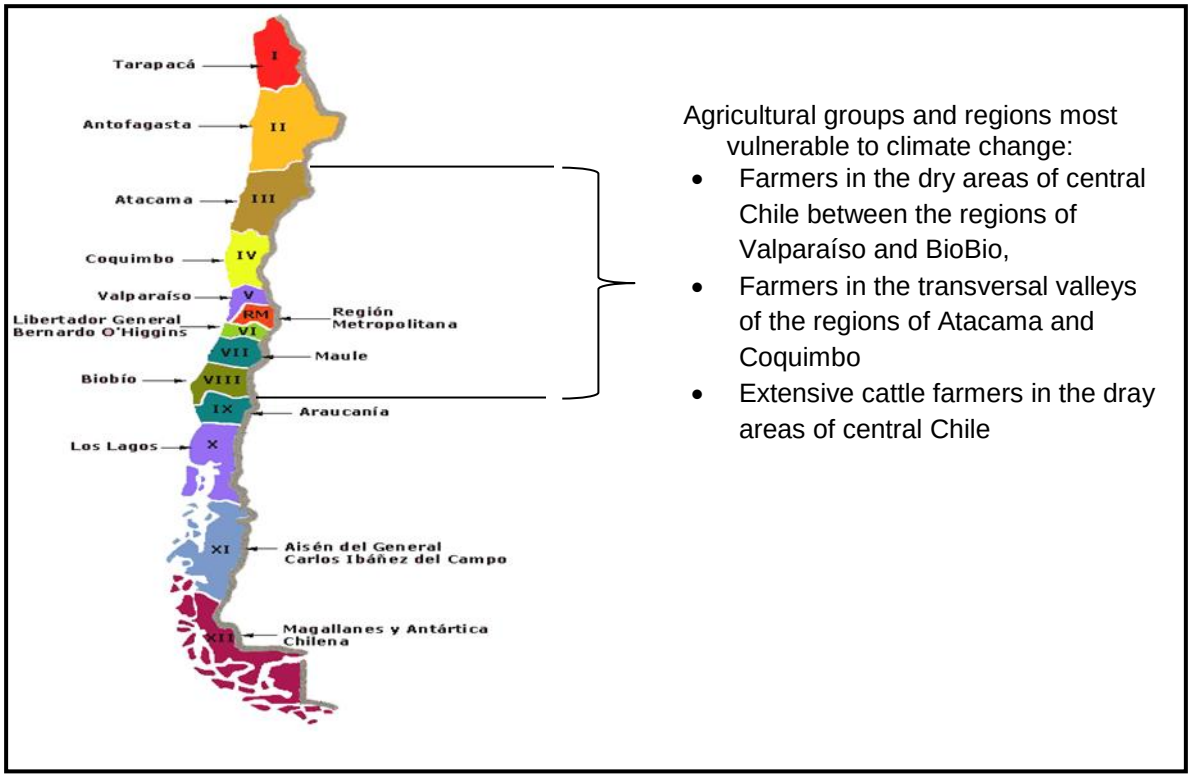

Fig 3: Regions and agricultural groups most vulnerable to climate change

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 y Pumanque (figure 4).

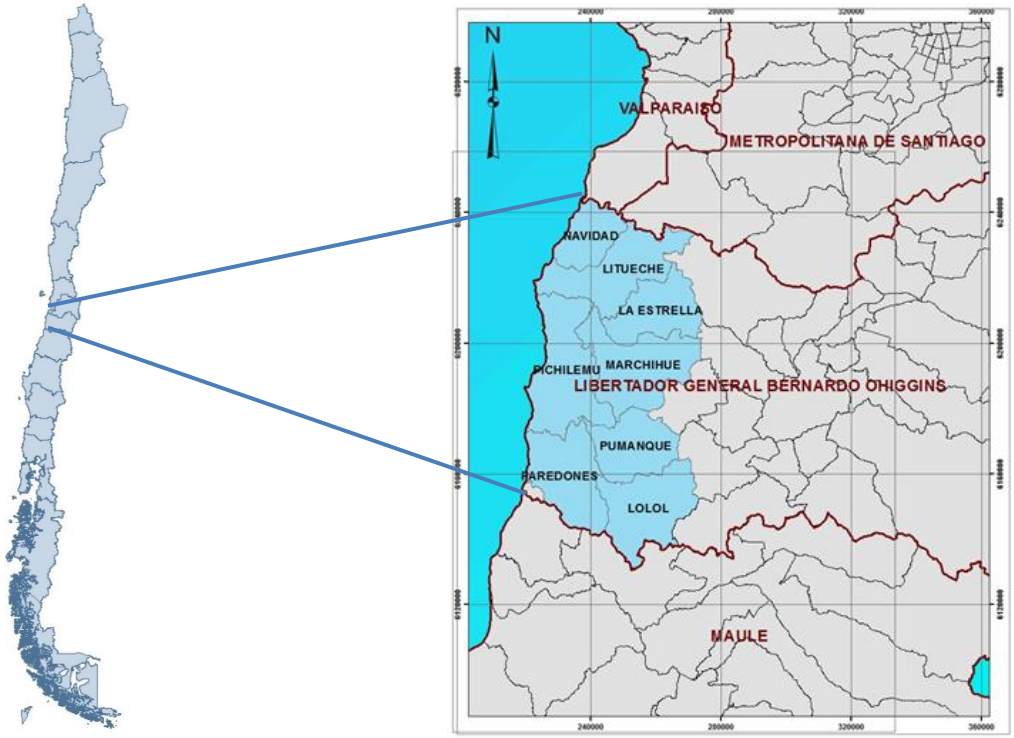

Figure 4: Communes in the project area in the O'Higgins the region

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 1100ml/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.

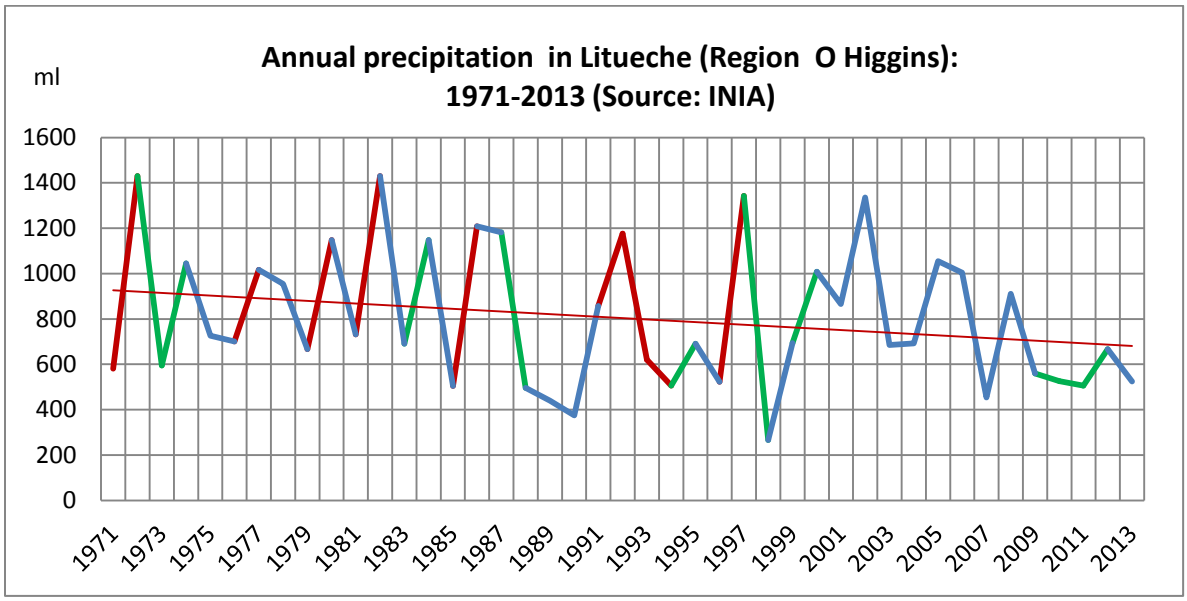

Figure 5: annual precipitation in one of the communes of the project area in the region of O'Higgins

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 communes 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.

Commune	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	Positivo
Lolol	Negative, high	Negative, high
Pumanque	Negative, low	Negative, low

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

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

Commune	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

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

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

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 communes, 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 communes 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 A&F&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**

*A&F&L: agriculture, forestry and livestock

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

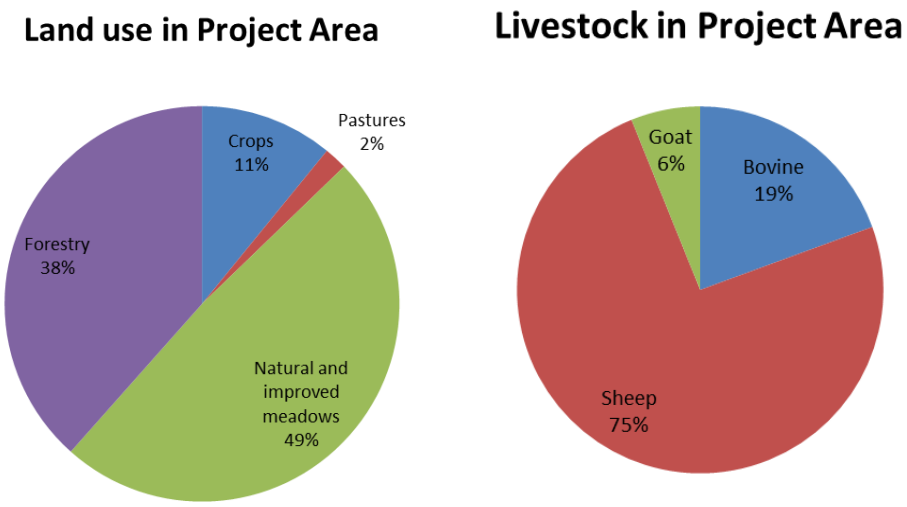

Figure 6: Land use and livestock composition in the project area

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. 49% of the area contains both, natural and improved meadows (table 5).

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

Production	Hectares	Percentage
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: cereals, fruits, grapes, vineyards and flowers (table 6)

Production	Hectares	Percentage
Cereals	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 cereal production is in non-irrigated land (=92%). The varieties of cereal crops cultivated are shown in table 7.The most important cereal 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
Sum	419,2	4.387,5		1.290

Table 7: Cereal 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 communes.

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

Table 8: Mean annual precipitation for 6 communes 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 communes 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.

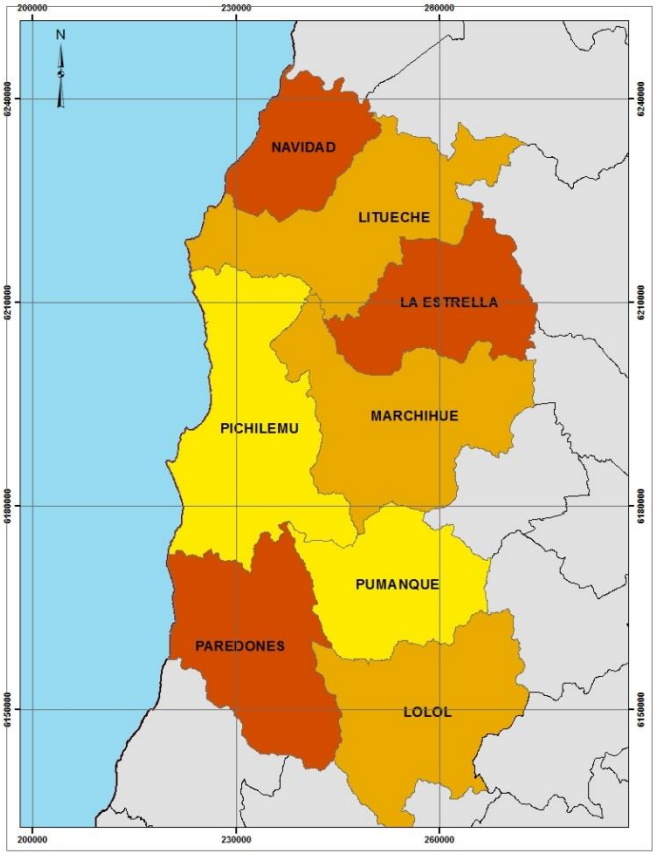

Figure 7: Erosion and Desertification in the communes of the project area. Source: CONAF- Programa de Acción Nacional contra la Desertificación / PANCD (2000).

Soil erosion and desertification are serious problems in the project area. The communes 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 cereal production are the main agricultural activities in the project area.

Livestock	heads	Percentage
Bovine	33.910	19,4%
Sheep	129.972	74,5%
Goat	10.689	6,1%
Sum	**174.571**	**100%**

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

Social - 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 homes.
The poorest communes 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 vulnerability. (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.

	Women		Men	
Characteristics:	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%
belonging to a farmer organization	65	4%	232	7%

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

Agro climatic information needs an strengthening of local capacity

Climate information products and services in agriculture aim to provide a full range of advice regarding climate, its impacts on crops, livestock and management practices to be followed 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 web page (http://agroclimatico.minagri.gob.cl), the National Agro-Climatic Network (RAN) (http://agroclimatico.minagri.gob.cl/ran/) and an Observatory for agro-Climatic risks information (http://agroclimatico.minagri.gob.cl/observatorio/).

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 proposed project (Table 11) which addresses this subject of agro climatic information needs.

Project / Programme Objectives:

List the main objectives of the project/programme.

Main objective:

- Increase 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:

- 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.

- Improve the decision supporting agroclimatic information management for actual climate and future climate changes for local MINAGRI professionals and farmer communities.

- 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.

Project / Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub-sets of stakeholders, regions and/or sectors that can be addressed through a set of well defined interventions / projects.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
1.-Capacity building in climate variability and climate change related to appropriate farming practices with respect to soil, livestock, water and crop management.	1.1:Creation of training and advisory teams for agro-technology transfer for each one of the 8 communes of the project area, coordinated and supervised by local INIA experts 1.2: Implementation of 9 demonstration fields for agro-technology transfer (1.4, 1.5, 1.6 and 1.8) including its infrastructure and equipment (fencing, water troughs, electrical power supply, etc.): 4-5 hectares in each of the 8 communes plus one on INIA ground.	Increased 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 500 farmholds in the project area.	1.1.-1.2: 1,060,000
	1.3:Acquisition (including maintenance and		1.3: 2,800,000

	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.		
	1.4: Training in sustainable soil management: plowing practices, fertilizing practices, soil fertility recovering practices, holistic soil management.		
	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.		1.5: 1,600,000
	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)		1.6: 300,000

	1.7: Installation of rain water and surface runoff harvesting facilities in 550 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).		1.7: 2,750,000
	1.8: Capacity building through knowledge sharing and good practice demonstrations: • Visits of foreign experts (Australia and Brazil) and visits of members of the training and advisory team (1.1) to this respective countries. • Guided visits of farmers from the O Higgins region and neighboring regions to the demonstration fields of the project area (planned number: 3000 farmers) • Elaboration of manuals and workshops for dissemination of		1.8: 200,000

	appropriated farming practice		
2.-Installation of an information system for agro-climatic risk management and climate change adaptation.	2.1. Strengthening of the existing network of automatic meteorological stations (AMS) in the project area: • 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.	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.	2.1: 100,000
	2.2. 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		2.2: 200,000

	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.		

3. Project/Programme Execution cost			450,000
4. Total Project/Programme Cost			9,460,000[5]
5. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			500,000
Amount of Financing Requested			9,960,000

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	2015 (2nd semester)
Mid-term Review (if planned)	2017 (2nd semester)
Project/Programme Closing	2019
Terminal Evaluation	2019

[5] This total corresponds to the sum of the components of the project (9,010,000) plus the cost of implementation (450,000)

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: Capacity building in climate variability and climate change related appropriate farming practices with respect to soil, livestock, water and crop management.

It is expected that through the component 1 the rural farmers communities will increased their resilience capacity to the negative impacts of climate variability and climate change through the:

(i) Enhancement of abilities in soil, livestock, water and crop management.
(ii) Access to an agricultural machinery pool for soil management.
(iii) Increase of water availability and crop productivity in 550 farm holds in the project area.

The agro-technology transfer concept of the Project consists in a combination of "learning by doing" and "learning by seeing", where the farmers together with the local training and advisory teams will generate the expected concrete outputs 1.1 -1.8 of table 11.

The project aims to establish 9 demonstration fields including its infrastructure and equipment (fencing, water troughs, electrical power supply, 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 communes.
The other 8 demonstration fields will be established in each one of the communes of the project area: Paredones, Pichilemu, Marchihue, La Estrella, Litueche, Navidad, Lolol y Pumanque.

Each demonstration field will cover an area of about 4 to 5 hectares and will be located at the smallholders farms. A contract will be signed between the project authority and the owner of the farm, to detail the responsibilities of both parts.
Considering that soil and climate conditions are different in each commune, the practices that will be developed on the 9 demonstration fields shall depend, among others (see also table 3), on these differences.

The smallholders will 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.

As described in the expected output 1.3. of the Component 1 (table 11) , the project also considers the acquisition (including maintenance and operating costs) of agricultural machinery for the 9 demonstration fields which includes: tractor, regenerating pastures machine, zero tillage seed drill machine, horrow plow, chisel plow, subsoiler plow.

This equipment is going to be used both for the works at the demonstration field and to strengthen the technological capacities of the small farmers in the communes who will take part of the transfer program.

A register of the small-farmers involved will be made and also a calendar to organize the use of machinery outside the demonstration fields, considering their necessities. The requirements and employment of machinery by small-farmers shall be defined and monitored by the technician in charge of each demonstration field. Correspondingly, a mechanism will be established to authorize the use of machinery outside de demonstration fields. Details of machinery types and the justification of its use to enhance adaptive capacity to climate change can be found below.

Zero tillage seed drill machines: Allow direct seeding. Zero tillage method aims to enhance 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 the erosion and damages to soil structure, fostering the natural fertility, improving the 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 CO2 emissions and preserving water accumulation.

Subsoiler plows: This machine is ideal to plow soils on non-irrigated and dryland areas. The plow works between 35 to 45 centimeters under, allowing rupturing compacted soil layers. This action contributes to reduce runoff and erosive processes due to sediment dragging. It improves water accumulation in the soil profile enhancing the root growth and vegetable cover, such as grasslands for animal feeding. It improves progressively the physical and biological soil conditions, increasing organic matter amounts.

Chisel plows: Likewise subsoiler plow, but this plow works between 20 and 30 centimeters under.

Regenerating pastures machine: Allows direct seeding of pastures, with a minimum impact on soil, with similar benefits to the zero tillage seeding drill machine: reduces the erosion and damages to soil structure, fostering the natural fertility, improving the physical, chemical and biological characteristics over time and contributes to keep carbon and humidity inside the soil, reducing CO2 emissions and preserving water accumulation.

Backhoe: The backhoe will allow the construction of small water reservoirs on the soil. They will be design by INIA, considering a storage capacity range between 1.000 to 1.200 m3, to accumulate rain water. These reservoirs are very important to face water scarcity conditions during hot season (November to April).

Grinding machine: This machine allows the application of herbicides for weed control before the seeding process.
Tractor: With a minimum power of 110 HP.

The expected output 1.7 of the Component 1 (table 11.) refers to the Installation of rain water and surface runoff harvesting facilities in 550 farms including the acquisition of materials and equipment (roof materials, rain pipes, mobile water cisterns, pumps powered by renewable energy resources (sun, wind), greenhouse installation) and training by the advisory teams in the use and maintenance of this facilities.

This activity will clearly improve climate adaptation and resilience building with respect to increasing water shortage and will furthermore improve the agricultural productivity in an important number of smallholder farms in the project area.

Rain harvesting systems and irrigation materials lifetime is at least 15 years, according to their technical specifications. The farmers will be responsible for the maintenance of the infrastructure. With the proposed project they will receive the proper training on these issues (collection of water resources, storage capacity, cleaning processes, preservation of pipes, seals and other parts, etc.)

The efficacy of several alternatives of rain harvesting, storage and utilization of rain water 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 will be included)
With the proposed project 550 small-farmers and their families (more than 2.000 individuals) will be benefited with these systems that allow having fresh water for human and animal consumption and for agricultural production through the irrigation of small 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, by 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 give maintenance services for the systems at a big scale. An increasing interest has been developed in the region for rain harvesting systems due to the results of previous experiences. Related to that, the proposed project shall generate technology transfer and dissemination of results through technology transfer teams and capacity building 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 proposed project will help to improve the conditions of the small-farmers providing the necessary funds for some initial investments. It is expected that the capacity building activities of the proposed project and the dissemination of lessons learned, will motivate supporting solar energy systems for future projects.

By the other hand, the machinery acquired by the project will allow the construction of small water reservoirs with a storage capacity between 800 and 1200 m3. With the proper maintenance, these reservoirs have a lifetime of 10 to 12 years.

As a result of the activities previously mentioned it is expected that the availability of water for different consumptions will be ensure for the small-farmers, their families and their agricultural requirements, for a long period of time.

For the implementation of training activities 1.4, 1.5 and 1.6, there will be 8 local training and advisory teams for agro-technology transfer for each one of the 8 communes of the project area. These teams are composed of a local technician, hired by the Project, and a local INIA expert.

The responsibilities of the technician are, in general:

- to program and manage the agricultural labors at the unit;
- to establish and update a list of small-farmers to be benefit, their conditions, their capacities, their needs, etc., in order to focus the activities;
- to create a schedule (monthly and yearly) of the activities to be develop on the demonstration field for agro-technology transfer;
- to call for small-farmers of the commune which will be benefit from those activities;
- to create a schedule (monthly, yearly) of the activities to be develop outside the demonstration field, in farmlands;
- to coordinate all other issues related to the unit.

The 8 teams will be coordinated and supervised by the regional INIA office.

The training activities of the advisory teams will be focus on three main subjects:

- Training in sustainable soil management: plowing practices, fertilizing practices, soil fertility recovering practices, holistic soil management.
- Training in the use of crops (wheat), forage crops (legumes, grass), fruit trees (olives, nuts) and livestock (sheep) tolerant to climate variability and climate change.
- Training in efficient water management (irrigation technology powered by renewable energy resources) and water harvesting and storage on the 9 demonstration fields and on 550 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: clean reproductive management and nourishing of sheep breeds adapted to water scarcity conditions. This subject also includes training of small-farmers about reproduction and management of guard dogs for flock of sheep, introducing special dog breeds such as “Mastín de los Pirineos”.

The target groups of the training activities in the project area will be the entire farm family, including women and adolescents 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.

Capacity building activities are going to take place for approximately 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 the rural communities, around 10,000 people will be benefited from the activities previously mentioned.

One full-time technician will be hired for each commune, with the funds of the project. Each technician will manage one demonstration field, will be the connection between the small- farmer and the project and will be in charge of both the agricultural and agro-technology transfer activities.

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.

It is furthermore assumed that part of the capacity building block of Component 1 is the interchange with farmer communities from other Chilean regions with similar social and agro climatic characteristics and needs for improving farm management skills
In this context, the project will organize 3000 guided visits 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.

Component 1includes also capacity building activities through knowledge sharing and good practice demonstrations from agricultural experts and institutions from other countries:

> Visits of foreign experts (Australia and Brazil) and visits of members of the training and advisory teams to these countries.

Australia and Brazil have been chosen considering their experiences and exemplary management of soil and water under climate change conditions (Australia: CSIRO and National Research Flaghship Climate Adaptation; Brazil: EMBRAPA, Universidad de Londrina).

Finally it is assumed that the agro-technology transfer and capacity building activities of component 1 will furthermore provide synergies with three already exiting 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 this transfer program, the hectares under mechanized irrigation and the square meters of greenhouses built are expected to increase. Furthermore, small farmers will have the possibility to cultivate other species, 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. These seeds will be available to the project.

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

The main goal of Component 2 is to strengthen the National Agro-Climatic Network (RAN, see p.17) in the project region, to improve its products and to make them

available on a regular basis to climate hazards and climate change related decision making by the farmer population.

In this context (expected output 2.1, table 11), the project will acquire and install 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 following communes

- Navidad: AMS located at the Agricultural High School “Pablo Neruda”.
- Pichilemu: AMS located at the National Forestry Coorporation (CONAF)
- Paredones: AMS located at the National Forestry Coorporation (CONAF)
- Pumanque: AMS located at municipality ground.

Component 2 (expected output 2.2, 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 and in an uncomplicated language.
- Training of local INIA staff, the 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 will consider the special characteristics and needs of the small farmers, their families and their communities.
Some activities to be developed under this item are the emission of bulletins, climate forecasts and alerts, and include the elaboration of manuals and audio-visual materials for the target population: small farmers (men and women), adolescents, students from farm schools, etc.

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 clever” 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 proposed 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 actual situation is expected to improve through the two project components described in pages 23-27.

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

	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 12. Actual situation in the project area and expected project benefits

Actual 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 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 550 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 may increase 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.
• Low climate adaptation capacity of small farmers because they have no access to crop varieties and livestock races which are better adapted to climate change and extreme climate conditions.	• Increased crop and pasture production due to adequate land management and the use of appropriated equipment (e.g. zero tillage planter)
• Small farmers do not have appropriate access to agro-climatic information and are not trained in applying this information for agro-management decision making.	• Increased climate adaptation capacity because the Project provides crop varieties and livestock races better adapted to climate change and extreme conditions.
• 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.	• The project generates and disseminates on regular basis appropriated agro-climate information for farm management and trains farmer communities in its correct interpretation and application for “climate clever” decision making. • Small farmers are better informed about technical and financial support options and have improved abilities in the filing of the respective applications.

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

One of the principal outputs of the project is the implementation of nine demonstration fields for agro-technology transfer. Eight of these fields will be located at the farmers' property 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 at the projects end.

The output 1.7 of component 1, which consists in the installation of rain harvesting systems on 500 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 conducted, 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.

The new crop varieties and animal breeds on the demonstration field will be distributed cost-free to the farm owners. The economic benefits of the yield and the corresponding seed and offspring production belong to the farmers. The development and test of these varieties has already been financed by INIA.

The agricultural machinery pool of the project will be available either cost-free or for minimum costs to the small farmers of the project.

The local advisory teams for agro-technology transfer and training, coordinated by the local INIA office will consist of two technicians; one of them will be paid by INIA and the other by the project.

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

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.

The program is especially consistent with the “National Climate Change Adaptation Plan for Agriculture and Forestry”, published in 2013 by the Chilean government (Ministry of Environment and Ministry of Agriculture) which includes 21 adaptation measures.
The Plan can be downloaded from: http://www.mma.gob.cl/1304/articles-55879_InstrumentoFinalCC_Silvoagropecuario.pdf.

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.

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 SIRDS (Incentive system for sustainable agricultural soil management). It has been assumed that the joint efforts of these activities will generate synergies in farm management capacity building, climate change adaptation and rural poverty reduction.

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

In addition, a large part of the 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.

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 nor an evaluation or a declaration of environmental impact.

Some activities will need pertinent authorizations such as building authorizations, but the process of approval must start at the implementation time and involves local institutions.

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.

The proposed project will benefit a whole new group of 550 small-farmers from the 8 communes of the area. Farmers that were already benefited by the two initiatives previously mentioned are not considered among these 550. 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 utilization of the rain harvesting systems they already have and to develop a sustainable management of the resources on their farms. Permanent capacity building activities will be developed for producers and technicians, and also for students of rural schools of the area, in these matters.

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" method.

In this context, the farmers, the local MINAGRI experts and the local advisory teams are working 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 approximated 3000 farmers from outside the project area.

This combined learning and knowledge sharing approach will be enriched by learning through best practice experiences from leading agricultural institutions of other countries through visits from and to Brazil and Australia.

The project will implement a monitoring system with respect 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 the Project execution.

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.

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.

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

The supporting MINAGRI institutions are:

INIA (Agriculture Investigations Institute). Its mission is to generate and transfer knowledge and strategic technologies in order to innovate and enhance the agriculture competitiveness.

INDAP (Institute for Agriculture Development). Its mission is to support the development of the small farmer's agriculture to generate human, economic and productive resources that will contribute both to overcome the conditions of poverty and to make national agriculture sustainable and competitive.

At the end of proposed Project, its local advisory teams will be part of the Technical Assistance Programs of INDAP 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.

INIA will guarantee the continuous access of farmers to the agro machinery pool acquired by project.

The first year of the proposed project will be focused on the implementation of activities 1.1, 1.2, 1.3 and 2.1 of the components.

Scaled incorporation of small-farmers to the activities has been scheduled as follows:

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

*The target group are 2,200 small-farmers (farm owners) on the project area. The table shows the percentage of these small-farmers that will be incorporated each year to the activities 1.4, 1.5, 1.6, 1.8 and 2.2

The installation of rain harvesting systems, indicated in the number 1.7 of the 1st component, will be completed in the 4th year, with 550 units installed (550 small-farmers benefited among the 2,200)

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, around 10,000 people will be benefited from the project components.

By the other hand, around 12,600 small-farmers are located in the nearby regions - Regions of Coquimbo, Valparaíso and Maule. It is expected that more than 3,000 among those 12,600 would be benefit by the number 1.8 of the 1st component of the project.

INIA and INDAP technology transfer programs will secure the diffusion and capacity building activities and will allow expanding the number of farmers benefited. Also, SAG, through its support programmes will allow dissemination of the 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 activities of the proposed project will 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 frame, 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 on 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)

By 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.

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

The proposal has been categorized as Category C, considering there’re 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.

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	✓	

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

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

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

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

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

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

Project Objective(s)[6]	**Project Objective Indicator(s)**	**Fund Outcome**	**Fund Outcome Indicator**	**Grant Amount (USD)**
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**

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.

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

[6] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

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 project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Gladys Santis *Adaptation Officer* *Ministry of Environment*	Date: *July 28th, 2014*

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme 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"; "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.	
AGENCIA DE COOPERACION INTERNACIONAL – DIRECTOR EJECUTIVO ***Enrique O'Farrill-Julien*** Acting Director AGCI Implementing Entity Coordinator	
Date: July 30, 2014	Tel. and email:+56 (2) 28275756 eofarrill@agci.gob.cl
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[6] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.