



**PUBLIC BIDDING:
FINAL EVALUATION
PROJECT "IMPROVEMENT RESILIENCE TO CLIMATE CHANGE IN SMALL-
SCALE AGRICULTURE IN THE O'HIGGINS REGION".**

FINAL REPORT

FINAL INDEPENDENT EVALUATION

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I. Context of the Assessment.

Climate change represents one of the most important and urgent challenges of our time. Its adverse effects are manifested in different ways, such as rising temperatures, water scarcity, intensification of extreme weather events and loss of biodiversity. These impacts have significant repercussions on society, economy, and environment, especially in vulnerable regions, since the living conditions of the inhabitants in general have been modified, even generating migratory processes at the global and local levels, when communities lose access to natural resources that allow the reproductions of their minimum living conditions.

The O'Higgins Region is in the central zone of Chile, this area is highly affected by climate change and its consequences, as a result of the significant variations in climate conditions that affect production models for the agricultural activity in general.

During 2014, the Chilean Ministry of Agriculture, through the Regional Ministerial Secretariat of Agriculture of the O'Higgins Region, in collaboration with the Ministry of Environment, and with the support of the International Cooperation Agency for the Development (AGCID), submitted an application to the United Nations Climate Change Adaptation Fund (FACC). As result of this effort, and with the objective of strengthening the capacity to adapt to climate change in the territories most affected by this phenomenon in the region, the project was approved and the "Improvement resilience to climate change in small-scale in O'Higgins Region" project was launched.

The objectives of the project were established as follows:

General Objectives:

- To increase the resilience capacity in the rural agricultural communities in the coastal and inland drylands of the O'Higgins Region regarding to current climate variability and future climate changes.

Specific Objectives:

- Implement a capacity building and training system to increase the resilience capacity of communities vulnerable to climate variability and climate variation, regarding to livestock, water, and soil management.
- Implement measures and technologies to increase the availability of hydric resources in rural communities in the coastal and inland drylands of the O'Higgins Region.
- Improve decision making based on agroclimatic information management for current climate variability and future climate changes, focused on local professionals of Ministry of Agriculture (MINAGRI), and the rural communities.

This project was implemented by the International Cooperation Agency for the Development (AGCID), an agency certified by the Climate Change Adaptation Fund, and executed by the Ministries of Agriculture and Environment, whose objective was increasing the adaptive capacities of more than two thousand farming families in the eight communes of the coastal and inland drylands: Paredones, Pichilemu, Marchigüe, La Estrella, Litueche, Navidad, Lolol, and Pumanque.

The project focused on generating actions to address water scarcity and soil degradation and to enhance land production, ecosystem services and biodiversity.

Along these lines, 558 rainwater harvesting systems were installed to collect rainwater from the roofs that have been fitted out to this purpose and conducted by gutters and pipes to an accumulator pond. Thus, water is available for greenhouse irrigation, family vegetable gardens and animal drinking water.

In addition, the project promoted the implementation of concrete measures to increase climate resilience in the territory, such as the provision of infrastructure and technology to improve productive practices leading to a better use of resources, promoting sustainable agricultural practices and education and awareness of climate change.

To implement the project, a governance structure has been established at different levels of the project work, such as: Steering Committee, Advisory Committee, Regional Executive Committee, Local Committee, as well as selection and hiring of professionals, technicians, and administrative staff to carry out the project's activities.

The current evaluation process is carried out due to its importance in the framework of the project closure, considering for this purpose a Final Independent Evaluation (FIE), which must describe the project's impacts, the sustainability results, and the level of compliance in the long term. The current process is focused on the assessment of the set of actions considered in the project, including the participation of the direct beneficiaries, relevant actors of the territory and the entities that directly participated in its implementation.

II. Objective of the Report.

According with the established in the public bidding process and the service contract with the Undersecretariat of Agriculture of the Chilean Ministry of Agriculture, the main objective of the Final Independent Evaluation process (FIE) is *“To conduct a final evaluation of the Project, identifying and analyzing the achievement of the results and benefits that the Project carried out in the eight communes of the coastal and inland drylands of the O’Higgins Region, identifying the lesson learned in the project management cycle, as well as the elements that will contribute to the sustainability of the results to inform future similar projects”*.

The following are the specific objectives, and the contents requested on each of them, considered the present evaluation process.

Specific objective 1: Assess the pertinence and relevance of the Adaptation project in the five years of implementation.

- Analyze the consistency and relevance of the project with priorities and needs of the sectors, institutions, beneficiaries, and counterparts.
- Analyze the level of participation and commitment of the various sectors involved.
- Analyze whether the Adaptation Project remains valid after its implementation, as well as its relevance since its initial conceptualization approved on November 13th, 2015.

Specific objective 2: Assess the efficiency in the implementation of the Adaptation Project in the four and a half years of execution.

- Analyze whether the project achieved the planned results within the expected timeframe.
- Assess whether there was flexibility to adapt to changing environments during the implementation.

Specific objective 3: Assess the effectiveness of the implementation of the Adaptation Project in the four and a half year of execution.

- Evaluate the level of progress in the fulfillment of the expected results at the closing date of the project.
- Evaluate whether the follow-up mechanisms were adequate.
- Analyze whether the indicators proposed were effective to evaluate the projected results.

Specific objective 4: Identify the sustainability of the Adaptation Project’s results through:

- Identify if there was capacity building in Climate Change Adaptation.
- Analyze whether the Adaptation Project considered relevant actions to ensure sustainability, beyond (in time and scope) the resources of the Adaptation Fund.

Specific objective 5: Evaluate results of the Adaptation Project.

- Indicate concrete actions and measures developed as an effect of the Project on beneficiaries, partner institutions, and other relevant stakeholders.
- Analyze awareness and communication actions.
- Indicate the influence on community or regional socio-environmental norms or regulations due to project implementation.

Specific objective 6: Determine Lessons Learned.

- Identify the strengths and weaknesses of the project, considering the limitations imposed by external factors.
- Identify and systematize social and institutional lessons learned.

Specific objective 7: Final Recommendations:

- The purpose of the Final Independent Evaluation (FIE) will be to describe the results obtained from the project and the sustainability of these in the long term. The FIE should also indicate the actions needed to ensure the sustainability of the results over the time among the authorities and institutions with competences in climate change adaptation in rural areas.

III. Methodological aspects applied in the evaluation.

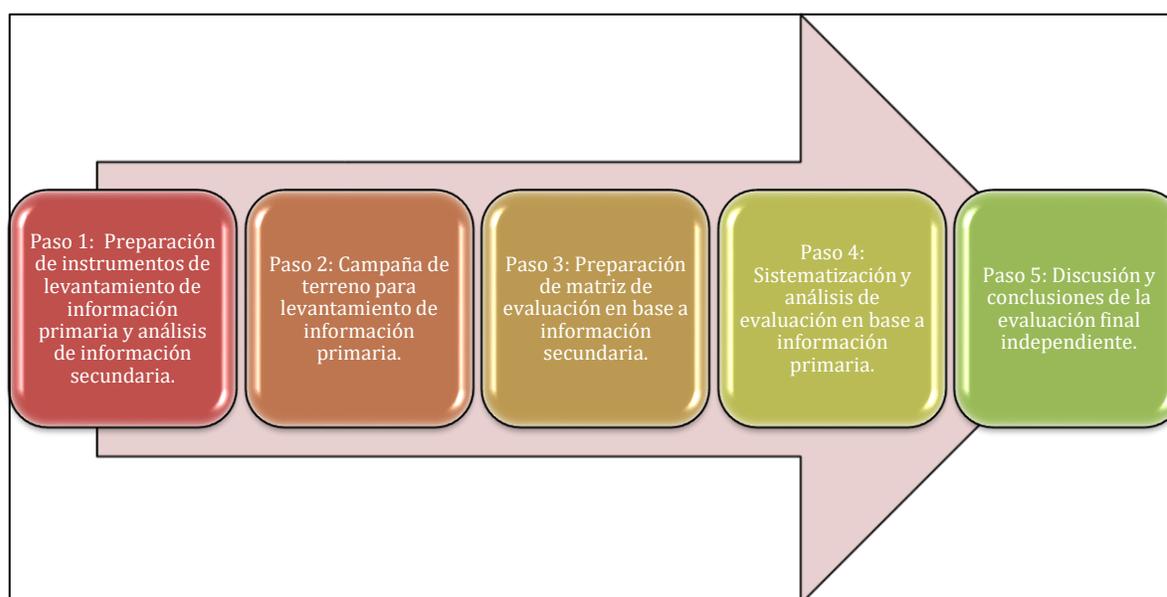
As result of the initial contract modification, in which the evaluation process was to be carried out in approximately 6 months, the final independent evaluation process was carried out in only one month, for which reason the field activities and the methodology used in the evaluation process had to be adjusted and adapted to the new conditions indicated by the Undersecretariat of Agriculture.

Important adjustments were made to the originally proposed methodology, which reduced the primary information gathering activities to the minimum necessary, and some more appropriate instruments were implemented to the new timeframe for the implementation of the evaluation.

In any case, some essential methodological aspects were taken into consideration to carry out an evaluation process that would effectively gather relevant information on the project, considering the direct and indirect beneficiaries' point of view, as well as that of the relevant agents involved in the implementation of the project.

- **Importance of the analysis of the secondary information;** in this process an in-depth analysis of the inputs provided by the counterpart, regarding the implementation of the climate change project in the O'Higgins Region was carried out. From the analysis of the systematized institutional information of the project was possible to extract valuable information that was subsequently submitted for analysis and discussion in the evaluation process.
- **Collection of primary information through targeted activities;** in this regard, the evaluation process that was carried out through the collection of primary information in the field, it was carried out through a field campaign that considered two weeks, between June 1st and June 15th, 2023, period in which part of the consultant team was deployed in the territory for the development of activities considered in this process, which considered the realization of community workshop with direct beneficiaries of the project in the 8 involved communes. In these instances, the workshops and the application of surveys directed to the project beneficiaries were carried out.
- **Relevance of the integration of secondary and primary information in the evaluation process;** in relation to this issue, an internal discussion process was considered among the consulting team towards the end of the consultancy, for the integration of the two levels of evaluation that were used, desk evaluation based on secondary information and field evaluation based on primary information. Some of the reflections reached up to this point were shared with the technical counterpart of the Undersecretariat of Agriculture in a coordination meeting.

Figure 1: General outline of the FIE.



Step 1: Preparation of instruments for the collection of primary information and analysis of secondary information.

Step 2: Field campaign to collect primary information.

Step 3: Preparation of the evaluation matrix based on secondary information.

Step 4: Systematization and analysis of evaluation based on primary information.

Step 5: Discussion and conclusion of the final independent evaluation.

Source: Own elaboration.

The instruments and methodology used to collect primary information for the evaluation process are as follows:

Field Campaign: Part of the consulting team was deployed in the field, in the 8 communes of the territory where the program was implemented, for the application of the instruments for the collection of primary information.

Interviews with relevant actors: The focus of the interviews considered various agents who participated directly in the implementation and governance of the project, who were interviewed online and in some cases in person.

Interviews with Stakeholders: Virtual or face-to-face interviews were conducted with agents of the territory who participated in a complementary manner in the execution of the project, who did not belong to the governance structure of the project, such as INDAP (Agricultural Development Institute), PRODESAL (Local Development Program), Regional Government (GORE), among others.

Community workshop with direct beneficiaries: To complement the primary information gathering, an evaluation workshop was held with direct project beneficiaries by commune, reaching a total participation that exceeded 130 farmers. In addition, a survey was applied to a total of 129 direct beneficiaries.

IV. Development of the Evaluation.

1. Project Justification.

The analysis of the justification of the project considers different aspects that were taken into consideration to carry out this point, such as the importance of an adequate design of the project with respect to the needs and problems of the territory, the participation of the involved population, among other relevant issues.

The climate change adaptation program was developed from the perspective of a set of premises and diagnostic elements, which, in summary, raised the possibility of improving the material living conditions of small farmers from coastal and inland dryland areas in the O'Higgins region.

From a general perspective and according to the results of the evaluation, it was possible to identify aspects that justify the implementation of this program, mainly from the perspective of the generation of enabling infrastructure for adaptation to climate change, the generation of training and the use of machinery and techniques that were generally unknown to the beneficiaries of the program.

In summary, it can be said that the targeting was aimed at peasant family farming, people with low levels of schooling and little income from their traditional rainfed agricultural production.

Another relevant factor when justifying the project is related to qualitative aspects, among them the most relevant is related to obtained practical tools for the development of production that they did not know or did not know how to carry out, mainly in the diversity of vegetables, which together with the massive implementation of greenhouses and rainwater harvesters, allow the beneficiaries to have fresh and diverse vegetables under clean production protocols that guarantee better family nutrition and product quality that is marketed locally, this situation was well appreciated during the community workshops held during this evaluation.

Analysis of the project design and its concordance with the problems of the territory.

The project design included two stages, the first one corresponded to the formulation of the project and its presentation by the International Cooperation Agency for the Development (AGCID), which was not approved in the first instance by the Climate Change Adaptation Fund and, as a result, an external entity was asked to reformulate it.

In this reformulation stage, the opinion of the Ministry of Agriculture, through the Undersecretariat of Agriculture and its various units, and the Ministry of the Environment was considered. In the first instance and in view of the effects of climate change on the agricultural sector in the coastal drylands of the O'Higgins Region, it was decided that this should be the focus of the project, which led to the involvement of various regional stakeholders in the design, such as: SEREMI* of Agriculture, SEREMI* of the Environment, INIA (Agricultural Research Institute) and INDAP (Agricultural Development Institute), among others, mainly. (* Regional Ministerial Secretary).

Positive aspects of the design.

Based on interviews with relevant stakeholders who participated in the implementation of the project, it is possible to identify some positive aspects of the project design process prior to the start-up of its implementation.

The diversity of stakeholders that participated in the design of the project is considered a very valuable aspect, as well as the fact that the design was prepared jointly, considering the views of different types of stakeholders, both at the regional and national levels. This point stands out as one of the most important aspects of the design stage, since it was possible to establish that there was some participation of local stakeholders before the start of the project.

The active participation of regional stakeholders in the design of the project is considered important, as this generated ownership and socialization of the various project activities in the territories.

The project design included an independent mid-term evaluation, which was carried out and highly valued, as it allowed to identify successes and problems and to adjust the project's execution. The original design also included a final independent evaluation that will make it possible to systematize the aspects to be improved in future initiatives of this size.

Aspects of the design that could be improved.

The project design did not consider an adequate period for project start-up and closure, in accordance with the administrative requirements of the fund in charge of project monitoring and control. This caused delay problems, mainly in procurement and contracts, which affected the achievement of the goals related to the execution time and left a feeling of noncompliance in different stakeholders of the project.

It is important that in the design of a project of this size (ambitious objectives and results), the technical and management capacities of the executor(s) are clearly considered, as well as the availability of sufficient time to achieve the project's results. In this case, INIA was in charge of the technical execution of the project, presenting difficulties to achieve the

objectives they had committed, to as a result of the multiple initiatives they execute in parallel, leaving them with very reduced specialist time.

It is important, particularly for an ambitious project such as this one, to have, at the time of design, a diagnosis of the environment (social, political, and technological) that is as accurate and current as possible, to determine the real capacities of the regional actors (research, transfer, and innovation) to develop and achieve the project's results and solutions.

Regarding execution times, the design considered a start date; however, the project began two years after its original date, which made it necessary to update information and adjust aspects that had changed in those years. Despite this, however, there were aspects that were not well recorded in terms of the projection of the effects of climate change in the intervention territory, where the reality showed that the effect of the decrease in precipitation was much more important than initially projected.

The project's objective was to increase the resilience of rural farming communities in eight communes in the coastal and inland drylands of the O'Higgins region to future climate variability and changes.

To meet this objective, the project developed a strategy that included two components: (1) technological support and training for beneficiaries to improve their agricultural practices with respect to climate threats to soil, water, crop management and livestock; and (2) installation of an information system for agroclimatic risk management and adaptation to climate change.

Component 1 was executed by INIA and accounted for a significant part of the project budget. Component 2 was executed by the Sub-Department of Information, Monitoring and Prevention for Integrated Risk Management (SEGRA) of the Undersecretariat of Agriculture.

In this regard, the implementation of the components through two different executors had the difficulty that there was not necessarily an adequate coordination between them. This meant that the activities of component 2 were not entirely related to the activities of component 1, preventing the necessary synergy between the two components to achieve the expected impact.

Analysis of the participation and commitment of the involved areas.

The project's target population are small farmers in the coastal drylands of the O'Higgins Region. At the time the project was designed, a baseline was established with approximately 600 beneficiaries who met this profile and expressed their interest to participate in the project. These farmers were invited to participate in workshops in the territory, with the

objective of socializing the project and involving them and having their commitment to participate in it.

As mentioned, project implementation took two years to begin, which meant that those who were part of the target population were not necessarily the same or did not have the same initial interest. This meant spending time during project implementation to update the project's beneficiary baseline, updating information or integrating new beneficiaries into the project's target population.

This required the support of the regional INDAP and the area agencies of Lolol, Marchigüe and Litueche since the direct beneficiaries of the project were considered within INDAP's user profile.

According to the interviews held with various stakeholders who participated in or were familiar with the implementation of this project in the territory, it can be established that the implementation of the project did not consider an active participation of relevant agents of the territory in the local dimension, such as the municipalities, INDAP, the PRODESAL program, CONAF (National Forestry Corporation), among others. This is even though the governance formally established the functioning of the Local Committees, but some interviewees indicated that there were not instances that, in a sustained manner over time, fulfilled a function in which local actors could effectively coordinate joint actions around the project.

What can be distinguished in the interviews is that the project and those in charge of its implementation considered the participation of this type of entities to the extent necessary for the fulfillment of certain project objectives, such as the search for direct and indirect beneficiaries (in this case INDAP and PRODESAL acquired relevance), or when it was necessary to implement certain activities that required coordination with the local authority or the municipality (such as the implementation of some technologies that were carried out in municipal schools).

As a result of this situation, some of the relevant agents interviewed consider that the project had a type of execution that was "distant" from local or regional institutions. The latter is evident in the interview with the Regional Government (GORE*), where it was indicated that they did not have detailed knowledge of the execution of the project and no instances of articulation were identified during its execution, but only at the time of project closure, where some initiative was presented that sought to give continuity to certain activities after its final closure, but this was not approved by the Regional Government.

According to what was indicated in several interviews, the project maintained a very close articulation at the regional level between the institutions that were directly involved in its implementation, such as the Undersecretariat of Agriculture, Seremi of Agriculture, and INIA, but had very little linkage with other entities at the regional and local level.

Analysis of Project Governance.

The governance of the project considered the participation of different actors at the national and regional levels in different instances, with the Seremi of Agriculture as the regional entity in charge of the project.

The governance of the project was formally established as follows:

1. AGCID acts as the "Implementing Entity".
2. Ministry of Agriculture (MINAGRI) is the "Executing Agency".
3. MINAGRI is also part of the Regional Executive Committee, through its SEREMI.
4. The Ministry of Environment (MMA) acts as a "Collaborating Agency" participating in the Steering and Advisory Committees.

In addition, the Undersecretariat of Agriculture signed an agreement with the Agricultural Research Institute (INIA), which acts as the "Principal Technical Advisor" and executes Component 1 of the project.

MINAGRI, through the Sub-Department of Information, Monitoring and Prevention for Integrated Risk Management (SEGRA), executes Component 2 of the project. The SEREMI of Agriculture of the O'Higgins Region is also in charge of project implementation at the regional level and in the beneficiary communities.

Other important stakeholders include the Office of Agricultural Studies and Policies (ODEPA) and the Agricultural Development Institute (INDAP). ODEPA participated in the initial formulation stage of the project and is part of the Advisory Committee. INDAP participates in the Regional Executive Committee, and its participation at the territorial level is vital, especially through the users of its Local Development Program (PRODESAL) and Technical Advisory Service (TAS) programs, in conjunction with the municipalities of the territory.

The SEREMI of Agriculture of the O'Higgins Region was the national director of the project, which oversees activities, ensures the timely delivery of resource contributions and is fully accountable to the Government for outputs and results.

The day-to-day management of the administrative, monitoring and accounting aspects was carried out by the Project Management Unit (PMU), which was contracted for this purpose.

Governance was composed of:

Steering Committee: This was the highest authority of the project. It included the Minister of Agriculture, the Minister of Environment, and the Executive Director of AGCID. They received reports from the UPG and relied on the Advisory Committee.

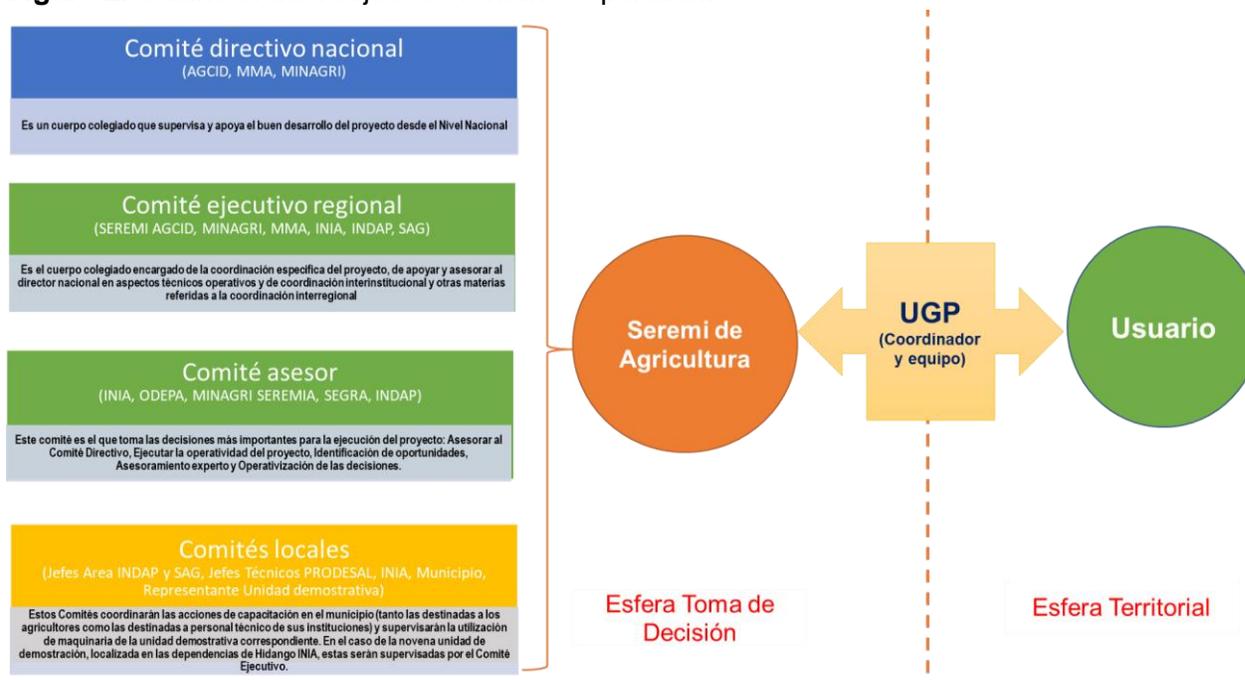
Advisory Committee: Provided expert advice and operationalization of decisions. The SEREMI of Agriculture of the O'Higgins Region, who is also the national director of the Project, chairs the Advisory Committee. The PMU coordinator acts as secretary. Representatives of AGCID, MMA and MINAGRI (advisors and professionals at the national level), INIA, ODEPA, SEGRA Sub-Department, and others invited to each meeting participate.

Regional Executive Committee: Responsible for the specific coordination of the project in the O'Higgins Region, advising and supporting the project director on technical operational aspects and interinstitutional coordination. Chaired by the SEREMI of Agriculture and with the participation of the highest regional authorities: SEREMI of Environment, INIA, INDAP, SAG (Agricultural and Livestock Service), and other guests.

Local Committees: An instance that sought to coordinate project's actions at the commune level. The main participants were the SEREMI of Agriculture, INIA, SAG, INDAP, PRODESAL, and the farmer representing the property where the Demonstration Unit is located.

Project Management Unit (PMU): This is the permanent working unit of the project, reporting to the national project director, and it is responsible for coordinating the execution and supervision of field activities of the project in general and of Component 1 actions.

Figure 2. Outline of the Project Governance operation.



Source: Own elaboration.

Post-execution validity of the Climate Change project.

Regarding the post-implementation validity of the project, approximately one year after project closure, relevant information was obtained in the community workshops with farmers, as well as through surveys of direct project beneficiaries and interviews with relevant agents. In this sense, an analysis is made of 5 aspects that derive from the execution of the project and that in the perspective of time could have been projected to remain in force at present.

Technical assistance.

From the direct beneficiaries of the project, farmers who implemented one or more technologies for adaptation to climate change, it can be said that the project's technical assistance was of great value and contribution to the monitoring and implementation of the project's land investments.

However, this technical assistance should be assumed in the vast majority of beneficiaries by the PRODESAL program at the local level, incorporating into the annual actions for each farmer activities that allow the producer to maintain the installed productive system (water harvester and greenhouse).

In very few cases, farmers were identified who did not currently have any INDAP advisory program, so the fact that the project's technical assistance is no longer present would not be very problematic. However, this process does not occur in a planned manner, since INDAP "assumes" that project beneficiaries must be attended and assisted in order to continue making good use of the available technology.

There was no handover process between the project's technical assistance and INDAP more permanent programs in the territory, that is, it appears that there was no information on the investments and carried out activities with each producer to INDAP or to the technical teams of PRODESAL or SAT.

Machinery.

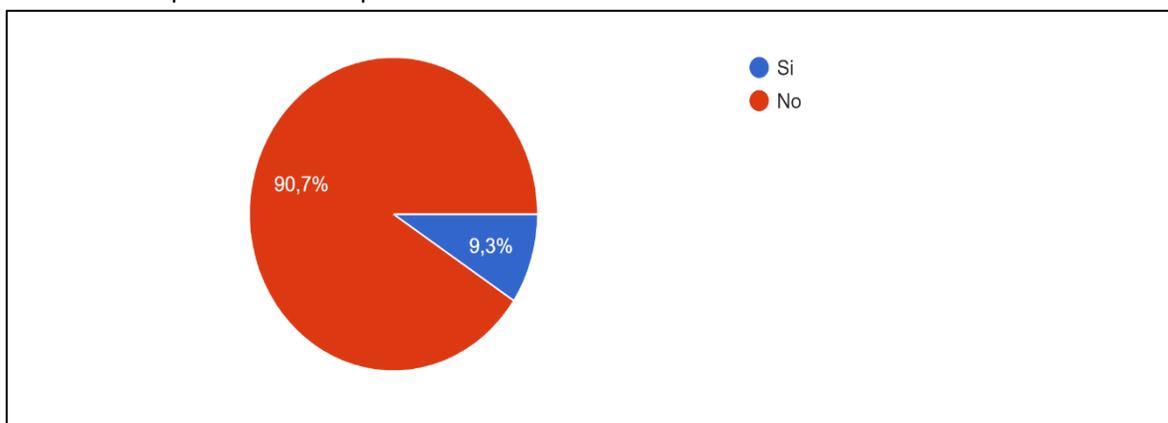
It can be observed that during the current agricultural season the machinery acquired by the project was not used by the farmers, a fact that can be seen in the survey of project direct beneficiaries.

In the community workshops it was possible to obtain information on the use made of the machinery, which was not used mainly by the direct beneficiaries of the project, although several of them did make use of this service. Most of the machinery was used by farmers in the project's communes who did not have access to the project's land intervention, but who were demanding this service, and who generally had more land to be intervened or tilled.

In general, the service was very well valued, given that the service was free of charge while this component was executed within the framework of the project.

Graph 1. Access to project machinery by surveyed users.

Do you currently continue to access the machinery of the Climate Change Project (machinery parks).
Number of responses: 129 responses. Blue: Yes / Red: No



Source: Evaluation survey of direct beneficiaries.

At the time of closing this evaluation, it could be identified that the project management unit (PMU) was preparing agreements with the municipalities of the territory that were part of the project to distribute this machinery. This implies that the machinery service should be provided by the local municipalities, although it is not clear how this service will be implemented.

The question remains as to whether the municipalities will be able to cover the high maintenance costs of these machines, as well as the operating costs, and whether the service will continue to be free of charge or not. There are still many doubts in this regard and the final destination of these machines is uncertain, as no model to sustain this service over time has been planned for the closing stage of the project.

Infrastructure and farm technology.

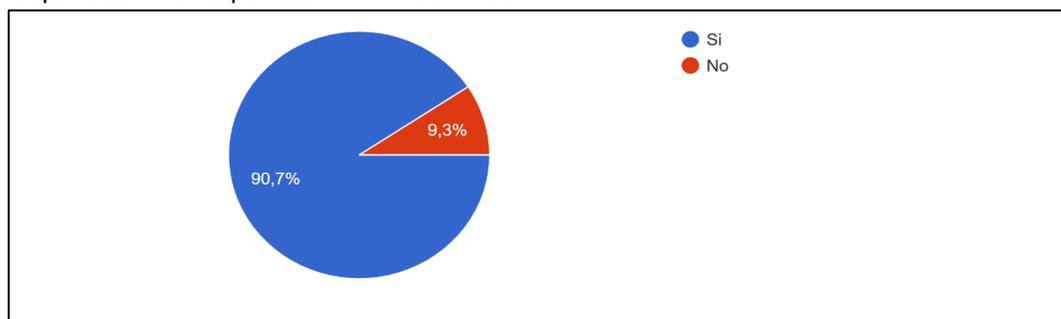
In general, the basic production infrastructure installed on the farms is being well used by the direct beneficiaries of the project, consisting of a rainwater harvesting unit and its respective 5,400-liter water accumulator.

As could be seen in the community workshops, in some cases the farmers themselves were able to assume the cost of adding a greater water accumulation capacity, or to increase the production area of the greenhouse provided by the project, which shows a very good adoption and valuation of this technology by some producers.

However, in a smaller percentage of producers, this technology does not remain valid, because in several cases an amount of money is required that is not considered by the beneficiary for the replacement of the plastic, in the case of the greenhouses that were installed at the beginning of the project (the last ones that were installed had a rigid polycarbonate roof). In the absence of this resource, the infrastructure remains unused until the beneficiary has access to the inputs that will allow its proper use.

Graph 2. Use of project materials and tools by surveyed users.

Do you currently use the materials and tools provided by the Climate Change Project? Number of responses: 129 responses. Blue: Yes / Red: No.



Source: Evaluation survey of direct beneficiaries.

It was also noted in the workshops with farmers that in several cases where photovoltaic panels were installed, these have failures or were never received by the electric company until today, which implies that this technology is installed but not functional.

Stakeholder coordination.

Regarding the articulation of stakeholders, it can be observed that at the regional and local level there is no change in the situation with respect to the situation prior to the project, that is, no institutional alliances have been identified that have arisen as a result of the implementation of the project that could be identified in a valid condition.

During the field evaluation period, it was not possible to identify any coordination instance at the local or regional level resulting from the implementation of the project, which is why it is indicated that in this component the articulation of actors at the local level returns to the original situation.

In this way, it can be said that the project left "few roots" that would make it possible to maintain the articulation between local actors, or between the local level and the regional or national level.

Regional Agroclimatic Observatory.

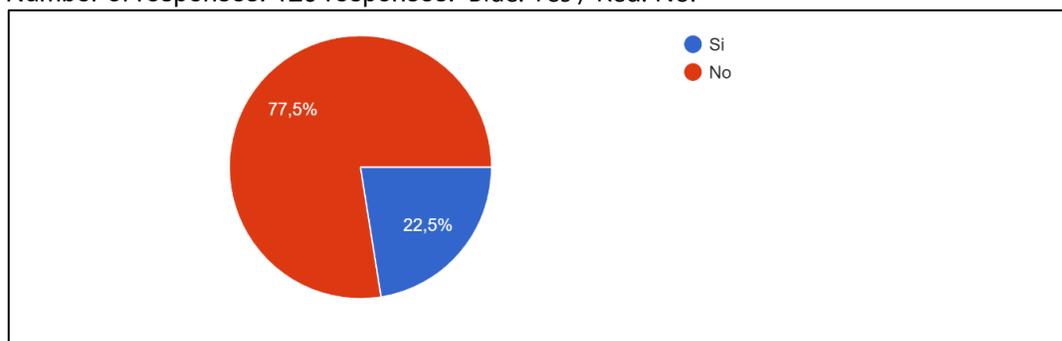
Although the surveys of direct project beneficiaries indicate that 22.5% currently use the agroclimatic information platform, it can be said that this platform currently generates little information, and the information it does contain is of a very general nature and does not compete with other web platforms that provide weather forecasts for up to 14 days.

It was not possible to identify whether this platform is generating direct alerts to project users about frost or heat stress.

Graph 3. Use of agroclimatic platform among surveyed users.

Do you currently use the agroclimatic information platform created within the framework of the Climate Change Project?

Number of responses: 129 responses. Blue: Yes / Red: No.



Source: Evaluation survey of direct beneficiaries.

A review of the web platform shows that information on agroclimatic alerts is generated mainly for the central valley area of the O'Higgins region and few for the coastal and inland dryland sectors.

Figure 3. Location of weather stations in the O'Higgins Region.



Source: <https://oahiggins.minagri.gob.cl/>

2. Analysis of project efficiency and effectiveness.

Analysis of the project indicators from the perspective of the Logical Framework Matrix.

This analysis is carried out based on the planning of the Project "Improving resilience to climate change of small-scale agriculture in the O'Higgins Region" dated 13.11.2015, contained in Annex I of this report. By virtue of the above, the following analysis is conducted with a view to evaluating the project and its sustainability from the perspective of the Logical Framework Matrix (LFM), in terms of proposing a redesign of the original planning and a quantitative measurement of the results of this project.

Casual relations of the program objectives (Vertical Logic).

From the project design point of view, FIN¹ is not stated as an impact objective.

In this context, the FIN of this project was: *"To contribute to the improvement of the quality of life of small vulnerable agricultural producers and their families in the Coastal drylands of*

¹ The FIN describes the solution to the problem that has been diagnosed at the territorial level. The FIN then represents the objective at the strategic level and describes the impact to which the project contributes (DIPRES* (Directorate of Budget, Chile). 2020. Methodology for the elaboration of the Logical Framework Matrix. 16 pp).

the O'Higgins Region, through the strengthening of their livelihoods", recognizing that the resources and livelihoods of the target population are their land, their work on the land, their water rights, among others that they have to live in their family nucleus and environment. This aspect is addressed in a report made at the start-up of the project, with socioeconomic data of the target population, which is the baseline of the project. When quantifying the income variable, the report said that 40% of the direct beneficiaries of this project had a property income between 100,000 and 300,000 Chilean pesos per month, measured in 2018, corresponding to a range between 125 and 375 US dollars².

It should be noted that the FIN is generally associated with the measurement of the progress of the target population in terms of the change in their welfare, so it is appropriate to begin with the verb "contribute", since at this objective level, the Project is not exclusively responsible for achieving what is proposed, but this is achieved with a set of public, social or development programs, granted by the Municipalities, PRODESAL and/or SAT of INDAP or other institutions that are articulated at the territorial level to generate synergies in their actions among the beneficiaries of the Project.

At the level of Purpose³, stated as an impact objective in this Project, which is expressed as follows: "To increase the resilience of rural agricultural communities in coastal and inland dryland areas of the O'Higgins region, with respect to current climate variation and future climate change". In this case, the purpose does not refer to the expected result, but to an action to be carried out.

According to the above, it is considered that the real purpose of the project was: *"Small vulnerable agricultural producers in the coastal drylands of the O'Higgins Region improve their resilience to climate change through the adoption of technological changes in their farms"*. However, it can be seen that the objective focuses on preserving and strengthening the livelihoods of highly vulnerable beneficiaries to adapt to the effects of climate change.

In terms of the components⁴ declared:

Component 1. Technological support and training to improve agricultural practices with respect to climate hazards for soil, water, crop management and livestock.

This component has two subcomponents:

² Exchange rate of 800 Chilean pesos/dollar, May 2023.

³ The Purpose describes the direct effect or expected result of the program on the target population (DIPRES. 2020. Methodology for the elaboration of the Logical Framework Matrix. 16 pp).

⁴ Components: These are goods and services that the program delivers to the beneficiary population and are defined as results, i.e., as completed works, completed studies, completed training, etc. A program may have several components, which must be necessary and complementary to each other for the fulfillment of the Purpose (DIPRES. 2020. Methodology for the elaboration of the Logical Framework Matrix. 16 pp).

- 1.1 Implementation of a training and capacity building system to increase the resilience of vulnerable farming communities to climate variability and climate change with respect to soil, crop, livestock, and water management.
- 1.2 Support agroclimatic information management for current and future climate changes for local MINIAGRI professionals and farming communities.

Component 2. Installation of an information system for agroclimatic risk management and climate change adaptation.

These components are aimed at:

First component: that small agricultural producers have access to support for technological change and training in productive aspects to adapt to climate hazards, which is broken down as follows:

Subcomponent 1.1: Beneficiaries build resilience capacities through the project's training system and,

Subcomponent 1.2: Beneficiaries receive technological changes through the reception of products, services, and infrastructure.

Second component: Beneficiaries receive training for agroclimatic risk management and climate change adaptation.

All of the components are aimed at creating capacities and providing technological changes through the installation of infrastructure and the reception of new inputs, such as the installation of rainwater harvesters, biofilters for the reuse of gray water, photovoltaic panels for the installation of technician irrigation, greenhouses for changing the daily diet, among others, effective interventions to address the effects of climate change, from the perspective of a sustainable development, technology for the production of green fodder, the change in fodder species more resistant to water stress, soil tillage, among others, effective interventions to address the effects of climate change, from a perspective of water scarcity, both as a productive input and for human consumption to maintain the right to a dignified life.

Likewise, it is argued that, despite the existence of actions and activities that were incorporated into the components after the initial design, they managed to enrich the delivery of goods and services to achieve the proposed coverage in each of the two components of the Project, so that the vertical logic of the LFM is validated, considering the reformulation proposed in its objectives.

Program Indicator System (Horizontal Logic)

In the evaluating process of the Horizontal Logic, it was observed that the original project and the progress reports have process indicators that show compliance with the planned

activities and the progress of the project, a fact that is positively valued. However, there are no indicators that measure the results obtained at the level of purpose and product.

For this reason, we proceeded to propose new indicators to measure the results of the Purpose:

Effectiveness/Intermediate Outcome: Percentage of beneficiaries who improve their quality of life with the project intervention.

Quality/Intermediate Outcome: Percentage of beneficiaries who rate the project 6 (very good) and 7 (outstanding).

Economy/Intermediate Outcome: Percentage of total project budget execution.

Efficiency/Intermediate Outcome: Percentage of total administrative expenditure of the project over the total expenditure of the project.

Observing at **Component 1**, it was decided to separate the two subcomponents, where the first measures the results of the training, demonstration units, among others, and the second measures the acquisition, installation and use of the tools and materials provided by the project, which meant installing small investments and infrastructure on the farms of the direct beneficiaries.

In the case of **Component 2**, the fulfillment of activities for its implementation and the subsequent use of the tools provided, was considered.

On the other hand, the establishment of quantifiable goals in the original project is positively valued, such as: *"5,000 hectares with improved soil quality"*, belonging to Component 1, which could be measured. However, there were others such as *"Household income increased by at least USD 1,000/year"*, whose baseline was established in an analysis conducted by a professional sociologist, but the change in the status of the beneficiaries and their families at the end of the project could not be measured, or the *"20,000 liters of water available per beneficiary a year"*, or *"Adequate information is generated and disseminated through the appropriate media services, together with training, improves decision-making"* corresponding to Components 1 and 2, where it was not possible to generate a measure to quantify the impact of the project on direct and indirect beneficiaries.

Regarding to the **assumptions**, two fundamental statements are highlighted. The first is related to *"Climate change is of greater intensity than projected by the analyses and studies"* and the second to *"Beneficiaries are reluctant to adopt the new technologies provided to adapt to the effects of climate change"*. In addition, *"Beneficiaries are reluctant to use agroclimatic information for decision making"*.

Consequently, it was decided to propose a new LFM that attempts to quantitatively measure the project's main results. To quantify the indicators, the information contained in the project reports and in the surveys applied to the project beneficiaries was used.

With this redesign, it is possible to validate the horizontal logic of the LFM and quantify the Project's results in terms of effectiveness, efficiency, economy, and quality, from the process, product, and intermediate result areas.

Analysis of the results achieved by the project and follow-up mechanisms.

Regarding the project's follow-up mechanisms, when observing the progress reports for each year, the close follow-up of the planned activities was positively valued, which were associated in detail with the cost of each one, together with the professionals responsible.

However, the level of detail in the development of the activities is such that it is impossible to have an overview of the progress of the project. In this regard, interviews with various qualified informants involved in the execution of the project revealed that the project was able to execute the planned activities due to the extension granted by the funding source. Despite this extension, these interviews revealed that some activities and adjustments were still pending, mainly around infrastructure installation.

Through this finding and observing the weaknesses of the indicators and their targets, as explained above, it was decided to propose a new LFM with its corresponding indicators.

In this measurement process, at the Purpose level, it can be seen that, in terms of coverage, the project served 1,488 direct beneficiaries (558) and indirect beneficiaries (930), where 31.1% were women. At this point, there was flexibility in terms of the beneficiaries established in the project, but that other beneficiaries with soil tillage on their land (use of agricultural machinery) were also assisted.

Regarding the change in the quality of life of the beneficiaries, 87.6% of those surveyed said that their quality of life had improved, with 60.5% of the respondents being women.

Regarding the quality measurement, 68.2% of the beneficiaries surveyed rated the project as 6 (very good) to 7 (outstanding), with 46.5% of women supporting this rating.

In terms of economy, the indicator shows a budget execution of 93.2% and the administrative expenditure with respect to actual expenditure reaches a value of 11.2%, a

result that is considered high with respect to the cost of other projects or programs executed at the national level⁵.

At the component level, it can be noted that, in terms of hectares of soil tilled, the project amply reached the goal of 193.9%, given the flexibility applied in the execution of the project to expand coverage to other beneficiaries.

In terms of efficiency, the effective expenditure of component 1 was calculated with respect to the number of users. The value obtained was USD 5,038/beneficiary, considering direct and indirect beneficiaries. The expenditure considered in this indicator is the budget executed for the entire technological package delivered to the beneficiary, in addition to the cost of the training system, advisory services and the installation of the demonstration units.

At the level of subcomponents 1.1 and 1.2, positive results were obtained in terms of learning strategies to face the effects of climate change (70.5% of the beneficiaries surveyed stated that they learned strategies to face the effects of climate change), as well as access to technological change packages, the use of which was reported as current by 90.7% of those surveyed. The details of these results are presented in the LFM Table below.

Regarding to Component 2, through interviews with professionals involved in its development revealed that activities were carried out, such as the setting up of agroclimatic roundtables to share knowledge on the effects of climate changes, as well as the delivery of materials to the beneficiaries to generate the Participatory Science Network, in order to periodically feed the Regional Agroclimatic Observatory (RAO), a platform implemented in the framework of this project for the delivery of information and land use decision making, however, when the use of this tool was consulted among the beneficiaries surveyed, it was found that only 22.5% used it.

⁵ See costs of administration of public programs in the improvement of agricultural development area, see at www.dipres.gob.cl

Table 1. LFM
resilience to climate change of small-scale agriculture in the O'Higgins Region (1 of 4)

Project: Improving

Enunciado del Objetivo	INDICADORES		Meta	Nivel de Logro	Supuestos
	Enunciado del indicador	Formula del indicador			
FIN:					
"Contribuir al mejoramiento de la calidad de vida de los/as pequeños/as productores/as agrícolas vulnerables y sus familias del Secano Costero de la Región de O'Higgins, a través del fortalecimiento de sus medios de vida"					
	(Eficacia/Res. Intermedio) Porcentaje de beneficiarios que han recibido capacitación y cambios tecnológicos para la adaptación al cambio climático	(N° de beneficiarios que han recibido capacitación y cambios tecnológicos para la adaptación al cambio climático/N° de beneficiarios de las 8 comunas del proyecto)*100	-	266,6% de un total 1488 beneficiarios (558 beneficiarios directos y 930 beneficiarios indirectos), donde el 33,1% fueron mujeres beneficiadas.	
	(Eficacia/Res. Intermedio) Porcentaje de beneficiarios que mejora su calidad de vida con la intervención del proyecto	(N° de beneficiarios mejoran su calidad de vida del proyecto/N° total de beneficiarios encuestados)*100 N° Encuestados: 129	-	87,6% de los beneficiarios encuestados mejoró su calidad de vida, donde el 60,5% de mujeres sostienen esta afirmación.	El cambio climático es de mayor intensidad que la proyectada por los análisis y estudios
Propósito: "Pequeños/as productores/as agrícolas vulnerables del secano costero de la Región de O'Higgins, mejoran su resiliencia al cambio climático mediante la adopción de cambios tecnológicos en sus predios"	(Calidad/Res. Intermedio) Porcentaje de beneficiarios que califican con nota 6 (muy bueno) y 7 (sobresaliente) al proyecto	(N° de beneficiarios que califican con nota 4 y 5 al proyecto / N° total de beneficiarios encuestados)*100 N° Encuestados: 129	-	68,2% de los beneficiarios encuestados califica el proyecto con nota 6 (muy bueno) a 7 (sobresaliente), donde el 46,5% de mujeres sostienen esta afirmación.	
	(Economía/Res. Intermedio) Porcentaje de ejecución presupuestaria total del proyecto	¹ (Gasto total efectivo del Proyecto/ Presupuesto total disponible) *100	-	93,2%	
	(Eficiencia/Res. Intermedio) Porcentaje de gasto total administrativo del Proyecto sobre el gasto total del Proyecto	¹ (Gasto administrativo Total del Proyecto (expresado en USD)/Gasto efectivo total del Proyecto (expresado en USD))*100	-	11,2%	

¹ Source: Annex II

Table 1. LFM Project: Improving resilience to climate change of small-scale agriculture in the O'Higgins Region (2 of 4)

Enunciado del Objetivo	INDICADORES		Meta	Nivel de Logro	Supuestos
	Enunciado del indicador	Formula del indicador			
Componente 1. <i>Pequeños/as productores/as agrícolas acceden a soportes de cambio tecnológico y capacitación en aspectos productivos para adaptarse a las amenazas climáticas.</i>	<i>(Eficacia/Producto)</i> <i>Porcentaje de hectáreas de suelo labradas en predios de los beneficiarios del proyecto respecto de la meta.</i>	<i>(Cantidad de hectáreas labradas en predios de beneficiarios directos e indirectos/5.000 hectáreas con una mejor calidad del suelo)*100</i>	² <i>5.000 hectáreas con una mejor calidad del suelo.</i>	<i>193,9% (Un total de 1.488 beneficiarios directos (558) e indirectos (930), considerando RUT únicos.</i>	<i>Beneficiarios se resisten a adoptar las nuevas tecnologías que se le proporciona para adaptarse a los efectos del cambio climático</i>
	<i>(Eficiencia/Producto)</i> <i>Gasto efectivo por beneficiario atendido en el componente 1 (expresado en USD)</i>	¹ <i>(Gasto efectivo total del componente 1 expresado en USD / N° de beneficiarios del proyecto)</i>	-	<i>5.038 USD/ beneficiario. Un total de 1.488 beneficiarios directos (558) e indirectos (930), considerando RUT únicos.</i>	
Subcomponente 1.1. <i>Beneficiarios crean capacidades de resiliencia a través del sistema de capacitación del proyecto.</i>	<i>(Eficacia/Producto)</i> <i>Porcentaje de beneficiarios que aprendieron sobre estrategias de adaptación al cambio climático</i>	<i>(N° de beneficiarios que aprendieron estrategias de adaptación de adaptación al cambio climático/N° beneficiarios encuestados)*100 N° Encuestados: 129</i>	-	<i>70,5% de los beneficiarios encuestados logró aprender estrategias para adaptarse al cambio climático, donde el 50,4% de mujeres sostiene esta afirmación.</i>	

¹ **Source:** Annex II

² **Source:** Annex I

Table 1. LFM Project: Improving resilience to climate change of small-scale agriculture in the O'Higgins Region (3 of 4)

<i>Enunciado del Objetivo</i>	<i>INDICADORES</i>		<i>Meta</i>	<i>Nivel de Logro</i>	<i>Supuestos</i>
	<i>Enunciado del indicador</i>	<i>Formula del indicador</i>			
Subcomponente 1.2. <i>Beneficiarios reciben cambios de tecnológicos mediante la recepción de productos, servicios e infraestructura.</i>	<i>(Eficacia/Producto)</i> <i>Porcentaje de beneficiarios con instalación de cosechadores de agua respecto de los beneficiarios directos totales.</i>	<i>(N° de beneficiarios que reciben instalación de cosechadores de agua/N° beneficiarios de las 8 comunas del proyecto)*100</i>	-	<i>100% de los beneficiarios (RUT únicos). De 558 beneficiarios directos, el 58,3% de mujeres obtuvo el beneficio.</i>	<i>Beneficiarios se resisten a adoptar las nuevas tecnologías que se le proporciona para adaptarse a los efectos del cambio climático</i>
	<i>(Eficacia/Producto)</i> <i>Porcentaje de beneficiarios que reciben infraestructura e insumos productivos para el cambio tecnológico en sus predios respecto de los beneficiarios totales del proyecto.</i>	<i>(N° de beneficiarios que reciben infraestructura e insumos productivos para el cambio tecnológico en sus predios /N° beneficiarios de las 8 comunas del proyecto)*100</i>	-	<i>100% de los beneficiarios (RUT únicos). De 558 beneficiarios directos, el 58,3% de mujeres obtuvo el beneficio.</i>	
	<i>(Eficacia/Producto)</i> <i>Porcentaje de beneficiarios que aún utiliza los materiales y herramientas proporcionados por el proyecto</i> <i>(Indicador Sostenibilidad)</i>	<i>(N° de beneficiarios que utilizan los materiales y herramientas proporcionados por el proyecto/N° de usuarios encuestados) N° Encuestados=129</i>	-	<i>90,7% de los beneficiarios encuestados afirman utilizar las herramientas y materiales proporcionados por el proyecto, donde el 60,5% de mujeres sostienen esta afirmación</i>	

Table 1. LFM
resilience to climate change of small-scale agriculture in the O'Higgins Region (4 de 4)

Project: Improving

<i>Enunciado del Objetivo</i>	<i>INDICADORES</i>		<i>Meta</i>	<i>Nivel de Logro</i>	<i>Supuestos</i>
	<i>Enunciado del indicador</i>	<i>Formula del indicador</i>			
Componente 2. Beneficiarios reciben capacitación procesada para la gestión de riesgo agroclimático y la adaptación al cambio climático.	<i>(Eficacia/Producto)</i> Mesas agroclimáticas organizadas para compartir periódicamente conocimientos sobre estrategias de adaptación al cambio climático	<i>(N° de Mesas agroclimáticas organizadas en 8 comunas del proyecto)</i>	-	10 mesas agroclimáticas organizadas en las 8 comunas.	Beneficiarios se resisten a utilizar información agroclimática para la toma de decisión
	<i>(Eficacia/Proceso)</i> Beneficiarios/as que participaron en Ciencia Participativa para la implementación del Observatorio Agroclimático Regional (OAR)	<i>(N° de beneficiarios que participaron en Ciencia Participativa)</i>	-	50 beneficiarios participaron en Ciencia Participativa para la entrega de insumos al OAR	
	<i>(Eficacia/Proceso)</i> Plataforma agroclimática para la entrega de información	<i>1 Plataforma diseñada e implementada</i>	² Se genera la información adecuada que se difunde a través de los medios adecuados junto con la formación, mejora la toma de decisiones.	1 Plataforma diseñada e implementada	
	<i>(Eficacia/Producto)</i> Porcentaje de usuarios que utilizan la plataforma de información agroclimática (<i>Indicador Sostenibilidad</i>)	<i>(N° de beneficiarios que utilizan la plataforma agroclimática/N° de usuarios encuestados)</i> N° Encuestados=129	-	22,5% de los beneficiarios encuestados, sostienen que utilizan la plataforma.	

² **Source:** Annex I

Conclusions regarding the LFM analysis.

- The project's planning design was weak because the indicators and goals failed to measure the results achieved by the project.
- Rethinking the LFM, it is observed that important results were achieved in the project, such as the creation of capacities to face the effects of climate change. The improvement in the quality of life of the beneficiaries stands out.
- Regarding the sustainability indexes, it is positively valued that the beneficiaries still use their materials and tools. However, the same statement cannot be sustained with the RAO platform.

Recommendations regarding the use of the LFM.

- Design the planning of a project of this magnitude with an LFM approach, including a diagnosis with agronomic, social, and environmental perspectives.
- Continue to support beneficiaries who, despite the progress achieved, continue to be highly vulnerable, through participating institutions such as INDAP, PRODESAL and SAT programs.

Flexibility to adapt to changes in the context.

Flexibility in the implementation of the project is positively valued given the following antecedents:

From the point of view of the pandemic:

The pandemic was installed in the middle of the project implementation, directly affecting the beneficiaries, making them more vulnerable due to the restricted access to different sanitary elements, reason why the project adapted to this context, contributing with its support to men and women benefited to the project with basic elements for their care and protection, such as 1,674 bottles of alcohol gel (100 ml), 558 face shields, 1,116 reusable masks, 8 alcohol gel dispensers, tanks, and alcohol for the demonstration units, among other items.

From the users' point of view:

The project focused on serving 558 vulnerable beneficiaries in the 8 communes of the dryland area of the O'Higgins Region. In addition, water harvesters were installed in 4 rural schools. However, in the soil tillage service with the machinery acquired by the project, the number of beneficiaries increased to 930, who became indirect beneficiaries, because they were also able to access the improvement of soil quality to increase the productivity of their crops. The positive aspect of this flexibility is that the project was able to increase its coverage to other beneficiaries and the less positive aspects were the targeting criteria in the choice of these users because it was not clear which were the variables of choice.

From the point of view of technological packages:

In this aspect, the project not only provided the rainwater harvesters and installation of greenhouses to the direct beneficiaries widely valued by them, because it allowed to diversify their diet and dignify their daily lives by being able to have water and vegetables for their consumption, but also the project delivered, through the technological advances that were being developed, the following items: 558 spray pumps, 2 deliveries of seeds, among which is Triticale, a forage species resistant to water stress that provides a greater number of cuts in the season, 2,780 m³ of guano, spare plastic for replacement, 31 units of green hydroponic forage for animal feed, 558 reusable bags, 558 gardening kit, 1,674 nursery of 50-cavity, 46,800 meters of tapes for the installation of technician irrigation, 1,838 impregnated posts, 101 photovoltaic systems, 6 electric fences, pharmacological elements for the animals, 540 prime sheep, 71 brood chambers with frame, 1,000 green and red ear tags, 600 yellow earrings, among others. Some beneficiaries received the installation of 11 biofilters for the use of gray water. Sheep farmers also had access to ultrasound scanners to monitor the fertility of their sheep, among other items.

The totality of this technological package, together with the associated training system, improved the quality of life of the beneficiaries associated with the project, as mentioned in the measurement of the indicator set out in the LFM.

From the perspective of some interviewees, it was possible to establish that there was a high capacity to adapt to operational difficulties during project implementation. In this sense, it is indicated that the "small team", which is referred to as the network of professionals linked to the local consultancy, was able to solve a series of problems that arose during project implementation, resolving issues that had an impact on field activities very quickly and in relation to local coordination or in the territory.

However, it is indicated that in the face of the "big issues" of project execution there was no capacity to resolve them in an efficient manner, so that during the course of the project it was necessary to correct at the level of project execution reports, which had to be updated or modified as needed, however, there were activities that were not executed in a timely manner and that harmed some of the project's objectives.

Level of progress at project closing.

As indicated above, in terms of the economy indicator, the project showed a budget execution of 93.2% of the available budget, and the administrative expenditure with respect to the actual expenditure reached a total of 11.2%, a result that is considered high with respect to the cost of other projects or programs executed at the national level.

One aspect that could not be quantified in the field evaluation process is related to the effectiveness of some investments that were installed in the direct beneficiaries of the project and that were reported as delivered to the farmers. In this regard, it can be indicated that there are farmers who had some problems with the infrastructure installed on their farms, particularly regarding the installation of the photovoltaic panel system. On this point, in several communes where the communal workshops with direct beneficiaries were held, it was mentioned the existing problem with the NON-use of this infrastructure for not being enabled or with its reception by the respective electric company.

Another aspect to highlight on this point is that the project closed with a good level of compliance in the use of the agricultural machinery acquired to provide a good quality service to the farmers of the territory. However, in all the workshops held with the direct beneficiaries of the project, who were able to use this service until the previous agricultural season, they indicated that for the current agricultural season this service has been left without use, since there was no system or form of organization for this year that would allow farmers to continue accessing this service, which was highly valued by those who used it.

3. Analysis of the sustainability of the Project' results.

Analysis of the capacity building for adaptation to climate change.

It is important to point out some relevant elements in terms of adaptation to climate change, which allowed promoting the installation of capacities and empowerment in the segment served by the program to generate immediate and long-term adaptation measures through the acquisition of knowledge, skills and aptitudes that allow facing the climate crisis and thus resilience.

1. Education on climate change, among beneficiaries who were able to visualize the climate emergency in the territory. In this way, it is possible to raise and create awareness about climate change and the effects of the activities they perform, promoting individual actions that will facilitate behavioral change from a space of participatory co-responsibility.
2. Technical training on climate change that made possible to install competencies, skills, and knowledge to adequately address and adapt current production models, facilitating their adaptation to climate change issues from a productive point of view.
3. Access to information that made it possible to define and update the climate scenario in the territory, providing mitigation tools applied to production models and good practices that facilitated adaptation to climate change, leaving available information on the impact of climate change in the commune.

These elements established by the program facilitate the development, dissemination and deployment of technology, access to information that promotes and installs capacities based on education, training, and awareness of the direct and indirect segment. This is due to the precariousness of the labor relations models, the lack of a local approach that would allow the adoption of adaptation strategies, the average size of the farms under a CFA model and the resistance to change at both the individual and collective level.

On the other hand, the resilience component is fulfilled, through the creation and configuration of physical spaces adapted for the transfer of tools that allowed a better installation of competences to face climate change, beyond the social aspects involved, food production decreasing the dependence on external inputs, generating a positive effect in the incorporation of healthy and conscious food, achieving the involvement of the communities in the design and adaptation of the proposed solutions and, therefore, an improvement in the acceptability of the objectives set out in the program.

Analysis of the sustainability of the project components.

The project design did not consider sustainability actions, which caused difficulties at the time of its completion, and additional steps had to be taken to ensure the continuity of some of the products and/or services generated.

In addition, within the framework of project implementation, additional actions had to be taken to ensure the sustainability of the model of associative use of agricultural machinery, which was not well received and has so far been a concern of MINAGRI authorities.

It is also observed that the effort made in the development of the agroclimatic risk information system could be lost, since no actions aimed at the appropriability of this system have been identified, thus jeopardizing its sustainability.

As mentioned, it has been necessary to carry out complementary actions for the sustainability of the project. It should be noted that, within the same framework, service-learning communities have been created to strengthen community networks, based on the establishment of local interaction spaces, which have fostered the collaboration and appreciation of the program's beneficiaries, supporting adaptation strategies.

Notwithstanding the above, it is necessary to improve aspects related to the coordination of adaptation actions inherited from the project through the promotion of the local associative network, preventing the fragmentation and encapsulation of knowledge, fostering spaces for climate governance and social participation.

4. Results of the Climate Change project.

The Climate Change project has imposed a transforming challenge in the segment of its direct beneficiaries, as well as in the technical team that was linked to the Technical Assistance provided by the project. At the level of the direct beneficiaries, it has meant the incorporation of actions that allowed the modification of productive structures, as well as the adoption of technical capabilities that were not available before, allowing the awareness of the need for a change in production and consumption habits. At the level of the technical team, the project implied a constant challenge of technical preparation to be able to deliver adequate technical procedures for sustainable, agroecological production, with a low chemical load in the form of greenhouse production.

The program somehow enabled the conditions for the adoption of an inclusive and sustainable economic development model, although with room for improvement in the social, productive, and technological areas.

In terms of the provision of infrastructure that enables the development of adaptive capacity and resilience, there is evidence of various actions aimed at their fulfillment, including long-term approaches in terms of raising awareness of the impact of climate change at the local level and short-term ones, with the provision of technologies and technological packages in terms of productivity and efficiency in the use of available production resources.

Concrete actions and measures can be mentioned as an effect of the project on the **direct beneficiaries**, such as:

- ✓ Generation of cultural change as promoters of transformational changes, by raising awareness in the incorporation of consumption habits and good practices, creating capacities, recognizing the impact of tasks in daily work, not only in direct beneficiaries, but also in their immediate cultural environment and indirect beneficiaries.
- ✓ Creation of learning communities in co-responsible workspaces, including the communities in the design of actions, which has made it possible to show climate change issues, as well as the incorporation of good practices applicable to their productive models.
- ✓ Capacity to generate changes either through demand for action or the generation of enabling conditions for climate action.
- ✓ Recognize the local impacts of climate change and be aware of the way in which actions incorporated within the framework of the project can contribute to climate solutions.
- ✓ Generation and dissemination of information to facilitate action to achieve intervention in the adoption of good production and consumption practices.
- ✓ Revaluation of alternative lifestyles, breaking with the vertical integration of consumption.

Analysis of the actions and measures developed as result of the project implementation.

Results at the level of project beneficiaries.

Through the limiting condition resulting from the climatic characteristics of the coastal drylands of the O'Higgins Region, the challenge of integrating information on edaphoclimatic scenarios, considering the possible effects on the different local socio-productive ecosystems, has arisen. Under this scenario, the program "Improving resilience to climate change in small-scale agriculture in the O'Higgins Region" has made it possible to identify and apply short-term measures, as well as to install capacities with a high potential for long-term impact on local communities, as long as the necessary actions are articulated and coordinated to ensure their sustainability over time.

From the beneficiaries' point of view, it can be identified that the program had educational, outreach and dissemination achievements for the dissemination of knowledge and the construction of social capital that help to develop resilience at the individual and collective system levels present in each territory. This to considers that:

1. Achieves integration and adoption of behavioral change measures regarding production practices with focus on livelihood diversification, crop substitution and/or adaptation and soil and water conservation. This allows for adaptation based on local ecosystems, which makes it possible to absorb the impact of climate change while considering the communities in this process.
2. Adaptation and incorporation of technological options to improve productivity through crop management practices, water storage and harvesting and its efficient use.
3. Information and communication technologies were available to disseminate and capture relevant and updated information for analysis and decision-making. However, this was not exploited in all beneficiaries.

Likewise, it is necessary to mention those opportunities for adaptation as factors that facilitate the planning and implementation of adoption actions and that would contribute to expanding capacities and benefits in the territory. In this sense, awareness of the impact of climate change has been a tool that would allow the evaluation of risk and social vulnerability for the development of capacities in the territory, allowing an improvement in climate governance and, with this, to focus efforts on increasing the capacity for innovation in terms of adaptation to climate change.

Under this same analysis, it is possible to mention as limitations in capturing these opportunities those related to financial aspects, which could restrict the implementation of short- and medium-term mitigation measures. Also, under the same analysis, it is possible to mention limitations related to climate governance, exposing the lack of coordination tools to address cross-cutting issues and long-term challenges.

Results in institutions and relevant actors.

From the point of view of various surveyed, it is considered that at the institutional level the project has left an important learning experience for both AGCID and MINAGRI.

From the perspective of the time elapsed with the implementation of the project, it is considered that there is now clarity on many aspects that could have been better executed, such as internal coordination, execution times, the proper sequence of implementation of the components, among others.

One of the reflections that emerged in the interviews is that the project *"Installed the idea that despite the difficult conditions of the coastal drylands of the O'Higgins region, it is possible to reverse this, the feeling is that this was impossible. It gives a feeling of hope, that things can be reversed"*.

At the local level, the project considered some actions that had a positive impact on the availability of certain technologies that allow their use after the end of the project, such as the investment in some educational establishments that allow their use by young people in their training stage.

It is also important to mention that the project generated a space for interaction between public agents and from this space an interaction was generated with farmers in the territory to address issues related to the agroclimatic platform, which undoubtedly, while it was in operation, made it possible to raise awareness of several issues of relevance to farmers and local actors. Unfortunately, it is not expected to remain active after the end of the project, despite a positive assessment of this component.

Analysis of the results from the point of view of the direct beneficiaries of the project.

This section presents the results of the survey applied to the project beneficiaries. The instrument was applied to 129 beneficiaries who attended the community workshops organized by the project's evaluation team. In the following section, a brief description of the profile of the beneficiaries surveyed will be presented, followed by an analysis of the project results.

Profile of the beneficiaries surveyed.

Table 2 shows the distribution of beneficiaries who participated in this survey by commune and gender. It shows that female participation in this process was 67.4%, while male participation was 32.6%. The territorial distribution is homogeneous, with lower participation in Lolol and Navidad, which is related to the level of attendance at these workshops.

Table 2. Distribution of surveyed, by municipality and gender.

Comuna	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
La Estrella	1	,8%	13	10,1%	14	10,9%
Litueche	3	2,3%	11	8,5%	14	10,9%
Lolol	3	2,3%	4	3,1%	7	5,4%
Marchigüe	8	6,2%	14	10,9%	22	17,1%
Navidad	3	2,3%	5	3,9%	8	6,2%
Paredones	9	7,0%	12	9,3%	21	16,3%
Pichilemu	13	10,1%	15	11,6%	28	21,7%
Pumanque	2	1,6%	13	10,1%	15	11,6%
Total	42	32,6%	87	67,4%	129	100,0%

Commune. La Estrella/ Litueche/ Lolol/ Marchigue/ Navidad/ Paredones/ Pichilemu/ Pumanque/ Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

In terms of the distribution of the main crops of the beneficiaries surveyed, vegetable and livestock production stand out. They are followed in order of importance by crops and fruit trees (Table 3).

Table 3. Distribution of main category of surveyed, according to gender.

¿Cuál es su principal rubro productivo?	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Apicultura	1	,8%	3	2,3%	4	3,1%
Avicultura			3	2,3%	3	2,3%
Cultivos anuales	4	3,1%	4	3,1%	8	6,2%
Flores			3	2,3%	3	2,3%
Forestal			3	2,3%	3	2,3%
Frutales	1	,8%	7	5,4%	8	6,2%
Ganadería	21	16,3%	26	20,2%	47	36,4%
Hortalizas	13	10,1%	38	29,5%	51	39,5%
NC	2	1,6%			2	1,6%
Total	42	32,6%	87	67,4%	129	100,0%

NC: No contesta

Which is your main business category? Beekeeping/ Poultry/ Annual crops/ Flowers/ Forestry/ Fruits/ Livestock/ Vegetables/ NC: Doesn't answer/Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Regarding the role played by the beneficiaries surveyed in their households, 54.3% of women play this role in the family. This issue is relevant for this type of vulnerable target population, where women must bear the responsibility of providing for their families (Table 4).

Table 4. Distribution of surveyed, according to role in the household and gender.

Jefe/a Hogar	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
SI	37	28,7%	70	54,3%	107	82,9%
NO	5	3,9%	17	13,2%	22	17,1%
Total	42	32,6%	87	67,4%	129	100,0%

Household. Yes/No/Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

In terms of schooling, 52.7% have only a basic education, 34.9% of them being women. 34.1% have high school education and the rest are distributed among technical and university education. Only 2.3% have no schooling (Table 5).

Table 5. Level of schooling of surveyed, according to gender.

¿Cuál es el nivel de escolaridad alcanzada por usted?	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Enseñanza Básica	23	17,8%	45	34,9%	68	52,7%
Enseñanza Media	13	10,1%	31	24,0%	44	34,1%
Sin escolaridad	2	1,6%	1	,8%	3	2,3%
Técnico Profesional	3	2,3%	9	7,0%	12	9,3%
Universitaria	1	,8%	1	,8%	2	1,6%
Total	42	32,6%	87	67,4%	129	100,0%

Which is your scholarship level? Primary/High school/ None/ Technician/ University/Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Regarding the size of the land, 38.8% of those surveyed have land between 1 and 5 hectares and 31.8% have less than 1 hectare. A low number declared having a larger area on their land (Table 6).

Table 6. Surveyed' property size (in Ha), by gender.

Tamaño del predio ¿En qué rango se ubica?	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Entre 1 y 5 hectáreas	21	16,3%	29	22,5%	50	38,8%
Entre 10 y 20 hectáreas	9	7,0%	4	3,1%	13	10,1%
Entre 5 y 10 hectáreas	5	3,9%	14	10,9%	19	14,7%
Más de 20 hectáreas	2	1,6%	4	3,1%	6	4,7%
Menor a 1 hectárea	5	3,9%	36	27,9%	41	31,8%
Total	42	32,6%	87	67,4%	129	100,0%

Property size. In which range is located?

Between 1 to 5 Ha/ Between 10 to 20 Ha/ Between 5 to 10 Ha/ More than 20 Ha/ Less than 1 Ha/Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Regarding the age range of those surveyed, 52.7% are in the active working age range, however, the other 41.9% are in the elderly segment, which, given the territorial space where they live and the level of vulnerability they present, according to the report on the abbreviated diagnosis of the project beneficiaries⁶, makes them even more fragile (Table 7).

Table 7. Surveyed' age range, according to gender.

Rango de edad	GÉNERO					
	HOMBRE		MUJER		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
18 a 35 años	4	3,1%	3	2,3%	7	5,4%
35 a 60 años	15	11,6%	53	41,1%	68	52,7%
61 años o más	23	17,8%	31	24,0%	54	41,9%
Total	42	32,6%	87	67,4%	129	100,0%

Range of age. Between 18 to 35 years old/ 35 to 65/ 61 years old or older/Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Finally, the low level of associativity among the respondents is striking, because only 16.3% say they belong to a producers' organization. This is an issue to be addressed in future

⁶ Gonzalez, P. (n.d.). Abbreviated diagnosis on small-scale agriculture in the interior and coastal drylands of the O'Higgins region. 71 p.

interventions, since belonging to a group contributes to community collaboration, technological adoption⁷ and overcoming poverty (Table 8).

Table 8. Level of associativity of surveyed, by gender.

¿Es miembro de alguna organización de productores?	GÉNERO					
	HOMBRE		MUJER		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
NO	32	24,8%	76	58,9%	108	83,7%
SI	10	7,8%	11	8,5%	21	16,3%
Total	42	32,6%	87	67,4%	129	100,0%

Are you member of a producer organization? No/Yes/Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Analysis of capacity building for adaptation to climate change.

Regarding the lessons learned from the advice and training provided by the Project (Table 9), most of the respondents mentioned that they were able to learn new production practices to face climate change (70.5% considering grades from 4 and 5), with 50.4% of the women sustaining this affirmation.

Table 9. Quantification of surveyed' learning, by gender.

Sobre las actividades ejecutadas ¿Cuánto aprendió? A mejorar el manejo productivo para la adaptación al cambio climático	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
No logré aprender (1)	1	,8%			1	,8%
Logré aprender poco (2)	1	,8%	3	2,3%	4	3,1%
Aprendí ni mucho ni poco (3)	13	10,1%	19	14,7%	32	24,8%
Logré aprender (4)	10	7,8%	19	14,7%	29	22,5%
Logré aprender mucho (5)	16	12,4%	46	35,7%	62	48,1%
NR/NC	1	,8%			1	,8%
Total	42	32,6%	87	67,4%	129	100,0%

No Responde/No califica

On the activities implemented, how much did you learn to improve productive management for climate change adaptation? Gender-Male-Female-Total.

NR/NC: Doesn't answer/Doesn't qualify.

Source: Own elaboration based on primary information.

⁷ Wu F (2022) Adoption and income effects of new agricultural technology on family farms in China. PLoS ONE 17(4): e0267101. <https://doi.org/10.1371/journal.pone.0267101>

In relation to the demonstration units, 62.8% of the surveyed men and women stated that they improved their production system, with 45% of the women supporting this statement. Only 20.2% said that it partially and 17% that it did not contribute to their system (Table 10).

Table 10. Surveyed' opinion of the demonstration units, by gender.

Las Unidades demostrativas ¿le permitieron mejorar su sistema productivo?	GÉNERO					
	HOMBRE		MUJER		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
No	9	7,0%	13	10,1%	22	17,1%
Parcialmente	10	7,8%	16	12,4%	26	20,2%
Si	23	17,8%	58	45,0%	81	62,8%
Total	42	32,6%	87	67,4%	129	100,0%

Did the demonstration units allow you to improve your production system? No/ Partially/ Yes/ Total. Male-Female-Total.

Source: Own elaboration based on primary information.

Related to the previous topic, regarding the productivity level of their farm, 86.8% said that it increased with the support of the project, both with the technical assistance and the infrastructure installed on the farms. Some 10.9% believe that productivity was maintained, a fact that is also positively valued, given the effects of climate change in the dryland sector, where they are facing a very prolonged drought cycle. Only 2.3% said that productivity worsened, a response that is presumably associated with negative experiences with the project (Table 11).

Table 11. Surveyed' level of productivity, by gender.

¿Cambió la productividad en su predio?	GÉNERO					
	HOMBRE		MUJER		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Empeoró	2	1,6%	1	,8%	3	2,3%
Se mantuvo igual	8	6,2%	6	4,7%	14	10,9%
Aumentó un poco	17	13,2%	35	27,1%	52	40,3%
Aumentó mucho	15	11,6%	45	34,9%	60	46,5%
Total	42	32,6%	87	67,4%	129	100,0%

Did your property's productivity change? Worsened/ Didn't change/ Slightly increased/ Highly increased.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Consistent with the previous result, when asked if the project had an impact on their quality of life, 87.6% stated that it increased, between a little and a lot. Some 11.6% said it was maintained and only 0.8% said it worsened (Table 12).

Table 12. Surveyed' quality of life, by gender.

Calidad de Vida	GÉNERO					
	HOMBRE		MUJER		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Empeoró			1	,8%	1	,8%
Se mantuvo igual	7	5,4%	8	6,2%	15	11,6%
Aumentó un poco	21	16,3%	40	31,0%	61	47,3%
Aumentó mucho	14	10,9%	38	29,5%	52	40,3%
Total	42	32,6%	87	67,4%	129	100,0%

Quality of life. Worsened/ Didn't change/ Slightly increased/ Highly increased.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Regarding the overall appreciation of the project, the majority of surveyed were very positive, because if we consider grades ranging from 5 (good) to 7 (outstanding), the proportion reaches 94.6% (Table 13).

Table 13. Surveyed' rating of the project, according to gender.

Calificación del Proyecto Cambio Climático	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
1			1	,8%	1	,8%
2			1	,8%	1	,8%
4	3	2,3%	2	1,6%	5	3,9%
5	11	8,5%	23	17,8%	34	26,4%
6	15	11,6%	20	15,5%	35	27,1%
7	13	10,1%	40	31,0%	53	41,1%
Total	42	32,6%	87	67,4%	129	100,0%

Climate change Project Qualification. Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Sustainability of the Climate Change project post-implementation.

In terms of sustainability, 90,7% of the survey respondents stated that they still use the materials and tools provided by the project (Table 14), which speaks positively of the usefulness generated by this technological package among the project beneficiaries.

However, at present, 90.7% say that they do not have access to the soil tillage service (Table 15), a situation that shows the current difficulties in making the technical decision on the best strategy to continue providing the soil tillage service to small farmers in the 8 municipalities where the project intervened.

A similar situation occurs with the agroclimatic information platform, since only 22.5% use the information provided (Table 16), a worrying fact, because it shows the scarce sustainability of this service, which is so necessary for the project beneficiaries and for small farmers in the dryland sector of the region.

Table 14. Use of materials provided by the project, by gender.

En la actualidad ¿Utiliza los materiales y herramientas proporcionadas por el Proyecto de Cambio Climático?	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
No	3	2,3%	9	7,0%	12	9,3%
Si	39	30,2%	78	60,5%	117	90,7%
Total	42	32,6%	87	67,4%	129	100,0%

Are you currently using the materials and tools provided by the Climate Change Project?

Yes/No/Total

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Table 15. Access to the project's machinery, by gender.

En la actualidad ¿Sigues accediendo a la maquinaria del Proyecto de Cambio Climático? (parques de maquinaria)	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
No	33	25,6%	84	65,1%	117	90,7%
Si	9	7,0%	3	2,3%	12	9,3%
Total	42	32,6%	87	67,4%	129	100,0%

Are you currently still accessing to use the machinery provided by the Climate Change Project? No/ Yes/ Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Table 16. Use of the project's RAO, by gender.

En la actualidad ¿usted utiliza la plataforma de información agroclimática, creada en el marco del Proyecto de Cambio Climático?	GÉNERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
No	31	24,0%	69	53,5%	100	77,5%
Si	11	8,5%	18	14,0%	29	22,5%
Total	42	32,6%	87	67,4%	129	100,0%

Are you currently using the agro-climatic information platform created within the framework of the climate change project? No/ Yes/ Total.

Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Assessment and suggestions from users of the project.

The most highly valued aspects of the project by those surveyed were the infrastructure provided (38.8%) (water harvester and accumulator, greenhouse, solar panel) and the training and technical assistance (23.3%). The latter intervention is highly valued among small farmers, especially if one considers an andragogic model⁸, which recognizes the adult individual as an autonomous and self-directed being. Another element valued among the respondents are the services of machinery in 12.4%, for soil tillage, because it allows the aeration of the type of clay soil existing in the dry land territory, achieving improved crop production (Table 17).

Consequently, the delivery of these technological packages is highly valued by the survey respondents, generating capacities to face the effects of climate change.

⁸ Concepts of the Andragogic Model for adult education. Daza, Y. **Andragogy as a pedagogical foundation in the extension model.** In: Programa de formación en extensión: Orientaciones curriculares. Ed.: International Center for Education and Human Development Foundation, Cinde, 2019. p. 65-76.

Table 17. Valued aspects of the project by surveyed, by gender.

¿Qué aspectos usted más valora del proyecto Cambio Climático?	GENERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Capacitación y Asistencia técnica (Adquirir conocimiento práctico)	5	3,9%	25	19,4%	30	23,3%
Infratestructura proporcionada (Cosechador y acumulador de agua, invernadero, panel solar)	18	14,0%	32	24,8%	50	38,8%
Maquinaria (tractor, guanera)	9	7,0%	7	5,4%	16	12,4%
Otros (información, los tomaron en cuenta, compartir con pares, aumento prod. hortalizas)			5	3,9%	5	3,9%
Sin Respuesta	5	3,9%	10	7,8%	15	11,6%
Todo el proyecto	5	3,9%	8	6,2%	13	10,1%
Total	42	32,6%	87	67,4%	129	100,0%

What aspect of climate change project do you value most? Training and technical assistance/ Provided infrastructure/ Machinery/ Others/ Doesn't answer/ All the project/ Total.
Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Regarding the suggestions provided by the representatives (Table 15), 26.4% of the suggestions were to improve management in all its aspects, such as organization, coordination, fluidity in the delivery of information, response times, equitable delivery in the use of machinery, the permanence of the technicians, with whom trust is established, among other aspects. Next, in order of importance, with 20.9%, is the improvement of the infrastructure developed through maintenance and/or replacement of materials, increasing the water accumulation capacity, increasing the surface area of larger greenhouses. Lastly, it is mentioned to improve the supervision of the implemented infrastructure, support with more technical assistance, give continuity to the project as well as to the service of the machinery and increase the coverage of photovoltaic panels, a tool that was delivered only to 101 direct beneficiaries of the project (Table 18).

Table 18. Aspects to improve in future projects, by gender.

¿Qué aspectos usted mejoraría o cambiaría para un futuro Proyecto de Cambio Climático?	GENERO					
	MASCULINO		FEMENINO		Total	
	N	% del total de N	N	% del total de N	N	% del total de N
Acceso panel fotovoltaico	3	2,3%	5	3,9%	8	6,2%
Continuidad del programa (Seguir usando la maquinaria, elaborar nuevos proyectos)	5	3,9%	4	3,1%	9	7,0%
Fiscalización y supervisión de la infraestructura implementada	1	,8%	11	8,5%	12	9,3%
Generación de otras infraestructuras (Pozos profundos, reutilización de aguas grises, reutilización de agua por noria)	2	1,6%	2	1,6%	4	3,1%
Más capacitación y asistencia técnica en lo generado y otros rubros	4	3,1%	6	4,7%	10	7,8%
Mejoramiento de la infraestructura desarrollada (Mejores materiales, Mayor capacidad de acumulación de agua, invernaderos más grandes)	7	5,4%	20	15,5%	27	20,9%
Mejorar gestión (mejor organización, mejor coordinación, mejorar la información, uso maquinaria, mejorar los tiempos de respuesta, que no cambien los técnicos)	10	7,8%	24	18,6%	34	26,4%
Otros (Análisis de suelo, facilitar acceso a información)	1	,8%	3	2,3%	4	3,1%
Sin Respuesta	9	7,0%	12	9,3%	21	16,3%
Total	42	32,6%	87	67,4%	129	100,0%

Which aspect will you improve or change in a future climate change project? Access to photovoltaic panel/ Continuity of the program (continue using the machinery, elaborate new projects)/Implemented infrastructure supervision/ Generation of new infrastructure/ More training and technical assistance/ Improvement of the developed infrastructure/ Better management/ Others/ Without answer/ Total. Gender-Male-Female-Total.

Source: Own elaboration based on primary information.

Conclusions.

- Regarding the profile of the project beneficiaries, the high percentage of women who are heads of household, the level of schooling, the age range, and the scarce vocation to belong to productive organizations stand out, aspects that should be taken into account to give continuity to the support provided to this segment of the drylands of the region.

- The technical assistance system and infrastructure provided by the project improved the quality of life and generated capacities to face the effects of climate change among the project beneficiaries in the dryland sector of the O'Higgins Region.

- The technical assistance system and infrastructure provided by the project improved the quality of life and generated capacities to face the effects of climate change among the project beneficiaries in the dryland sector of the O'Higgins Region.

- In terms of sustainability, there are worrisome weaknesses in the service of machinery for soil tillage, which was highly valued by the beneficiary. This issue should be addressed from the point of view of user utility linked to a technical decision. Likewise, the sustainability of the agroclimatic information platform (RAO) is of concern, because currently the beneficiary does not have access to the data it can provide.

Recommendations.

- Continue with the support provided by the institutions participating in the project, such as INIA and PRODESAL, to ensure the sustainability of the intervention.

- Encourage associativity to promote collaboration among community peers to contribute to technological adoption.

Analysis of the project's awareness and communication actions.

According to some interviewees, there was a need to "take more advantage of the project's communication", since there was a communications office at the SEREMI of Agriculture, but this did not happen and there was a lack of information and detailed dissemination of the project in the local and regional environment.

It was a mistake not to involve the regional government in the entire project. It was a good opportunity to give continuity to the project and take advantage of what was already in place, such as the machinery, which is currently being managed so that it remains in the municipalities, but without complementary financing for its operation, at least from the availability of contributions with regional financing. This is a sign of the lack of awareness-raising actions from the implementation of the project to regional levels, or of actions with little impact in this regard.

The participatory roundtables that were developed at the communal level were valued by several interviewees, who indicated that "*they should be replicated*", in response to which it was suggested that they should be systematized as a methodology to continue applying

them in the territory. There are themes that have emerged post-project that are worth continuing to carry out these instances of communication, dissemination, and coordination between local and regional actors.

For the interviewees, despite the difficulties in its implementation, the opportunity to have had this project for its execution in the territory is considered very valuable. It is considered an important learning experience for the various local and regional actors. In this regard, it is indicated that valuable information was generated with the implementation of this project and that it is necessary to disseminate it.

From the beneficiaries' point of view, this project generated positive concerns because it offered them a set of activities that would bring about a concrete transformation in their way of relating to agriculture and, when completed, would enable them to improve their quality of life: either by improving their income; promoting self-consumption; providing new infrastructure; or developing training processes using machinery and tools to which they would not normally have access.

Although not all of them achieved this situation, most of the beneficiaries agree that what was proposed at the beginning of the project is related to the benefits achieved.

Impact on the development of local or regional norms or regulations.

In general terms, it is observed that the project did not generate positive externalities as indicated in this section, specifically at the level of any regulation or municipal ordinance, or at the level of the development of regional policies or strategies on climate change.

However, the O'Higgins region has some regional planning tools that consider this issue, but before the implementation of the project, for example in its regional development strategy (RDS), or in its regional innovation strategy (RIS).

Based on this background, it is not possible to establish reliably that the issues related to climate change, considered in the design of these regional planning instruments, were a result of the implementation of this project, since these issues were already a regional concern before the project was implemented.

5. Lessons learned from the project.

Valuation of the project by the relevant agents.

This section considers the global systematization of the interviews carried out with different relevant project agents, separating the analysis from different parts of the project execution, which analyzes from the design to the impacts and results of the project.

Project design.

For the design, a thorough information gathering was carried out, from the technical point of view, both from secondary information, which allowed justifying the need to carry out the project in the dryland communes of the region. Primary information was also gathered through field workshops, which allowed those who participated in the design to have a closer knowledge of the reality of the territory. Farmers were also involved, thus identifying the group of beneficiaries willing to participate in the project.

Despite of this, and from the point of view of climate change, one of the interviewees indicated that rainfall indicators changed between the period when the project was formulated, precipitation decreased even more, which affected, for example, the sizing of the rainwater collectors (undersized). Therefore, the information gathered was not adjusted, especially since the period between the design of the project and its execution was approximately 2 years. The SEREMI of Environment feels that the project was very productive, and that the sustainability perspective could have been added more.

From a more social point of view, it is mentioned that this approach was lacking at the time of designing the project. It is mentioned that *"A more social perspective was not incorporated into the project, a more thorough approach was not taken to select the direct beneficiaries of the project, which finally led to the need to make adjustments and reformulate the project"*.

In the opinion of one of the interviewees, the design went beyond the capacities to execute it: *"several developments were committed beyond the technical capacities to carry it out"*.

Project governance.

The Seremi of Agriculture oversaw execution, then there was the Project Management Unit (administrative management) and INIA technical counterpart, which initially had a technical director as part of the project management. This last aspect affected the initial development of the initiative because there was no general coordinator for the entire implementation of the initiative.

Among the components of the governance structure was that the SEREMI of Agriculture of the region would lead the project, to empower the local authority. This ultimately proved to

be a problem, since on the one hand it was difficult to allocate time to lead a project of this magnitude, and on the other hand, it took away continuity from the project, since the change of government also changed the direction of the project, altering its execution.

Under the SEREMI was the Management Unit or PMU, whose role was the administrative management of the project, and INIA, which was the technical part of the project, with a technical director in charge. After the change of government there was a restructuring in the governance of the project, there was a complete change of some teams, the role of the SEREMI and the PMU was strengthened, taking weight away from INIA, as the technical instance. The consequence for some is that this slowed down the project and it lost continuity. According to others, it strengthened the work in the field by the technical teams hired to execute the project in the field and ordered the direction of the project.

In the case of the Emergency and Agricultural Risk Management Section (SEGRA) part of the Undersecretariat of Agriculture, which oversaw component 2, they were not part of the Governance, which made it somewhat difficult for them to act. INDAP also had a very distant participation in the execution of the project; according to their point of view, they were not involved, they only participated more actively in the design, but not in the execution.

Another aspect considered was to bring the communes closer to the project, so local committees were established as an instance where farmers, representatives of the municipalities and representatives of agricultural organizations in the territory participated, however, this instance, during the development of the project, lost strength and there was no active participation of the beneficiaries in the governance instances.

In general, the evaluation of governance is that it was a complex structure that generated little flow of information, hindered decision making, it was necessary to wait a long time to solve problems, and there was a lack of more executive bodies.

Articulation of actors.

Articulations existed at the territorial level but did not exist at a more formal level. In this sense, "the communication and articulation of the PMU with the mayors and local committees is highlighted, but not with the rest of the governance members". One of the interviewees mentions: "There was articulation, but with resistance".

The articulation between components was low in the first stage; once important changes were made to the project, the feeling is that this flowed in a better way. It is mentioned that the agroclimatic roundtables (component 2) played an important role in showing the usefulness of the actions implemented under component 1.

The flow of information required by the PMU to report to AGCID was difficult and not very fluid. To resolve this, a system was installed "in the cloud" to keep information on project activities more up to date.

There were links, in some way, with different actors in the territory, such as: Municipalities, through PRODESAL, in general there was a good reception, they lent their facilities, they supported everything within their reach. There were also links with agricultural technical high schools, Prodemu* (Women's Program), INDAP, CONAF, among others. In INDAP's opinion, the relation with them was not sufficient; they expected more, considering that most of the beneficiaries were their users.

Regarding the Regional Government, the mandate was for them to be involved in some way in the execution of the project, at the beginning they were involved, a presentation was made to the CORE* (Regional Council) of the project, however, this was diluted during the development of the project. In the last year, a proposal was presented to support continuity by financing the management of the use of the machinery; however, so far nothing has materialized.

Project execution.

In the opinion of those interviewed, the main factor that altered project execution was the COVID-19 pandemic. In this sense, activities had to be adjusted in order to achieve the project objectives. Training could no longer be done in groups; it was necessary to work one-on-one with the beneficiaries, generating trust between the technical teams and the beneficiaries, which had not been achieved at the beginning.

Another element that affected implementation was the dependence of the project on a political actor because the change of government meant a change in the direction of the project, there was a renewal of the technical teams, which altered and generated delays in implementation.

In terms of decision making, at the field level (local coordinators, technical teams), at a higher level there was no capacity to resolve issues on time, thus there were activities that were not executed in a timely manner.

There was a lack of deeper knowledge of the beneficiaries, for example, many of them did not know how to read, which made it necessary to generate material according to this situation.

Despite the fulfillment of the objectives, this was not within the planned timeframe; time and resources were lost due to project management problems. For example, component 2 began practically in year 3 of the project.

The positive aspects of the project include the installation of rainwater harvesters and the diversification of species (triticale), mainly. Regarding the photovoltaic systems, it is believed that there was a lack of knowledge of these systems, which delayed their installation.

As for the agroclimatic tables, those who expressed an opinion on them had a positive evaluation, and it was even mentioned that the methodology is being replicated in another region of the country.

In relation to the machinery, the opinion was that it was poorly planned and executed; there was a cost to the users in waiting for the machinery and there was an opportunity cost. Notwithstanding the above, it is also mentioned that in some cases the use of machinery meant an increase in the target yield, which was highly valued by the farmers.

Regarding project follow-up, this was continuous "the Follow-up was good, but progress was slow (decision making was slow)". A report was made on all activities: Annual Operational Plan. The activities carried out were reported and sent to the AGCID and the advisory committees, and if necessary, decisions were made, but this was slow.

The problem in the execution of the project is that a start-up period was not contemplated. Hiring, procurement, among others, took a long time and this was not considered in the project design and affected its execution. Another aspect not considered was the induction of the equipment; it took at least 6 months to get the equipment up and running. On the other hand, the diagnosis for the project design was from 2014 (558 beneficiaries were identified). Once the project started it was necessary to make a new diagnosis, where many changes were found in the beneficiaries, even some had died, which meant looking for new beneficiaries, together with PRODESAL. It was not possible to start with the technical execution until all this was done, it was about a year late.

Sustainability.

In summary, "in the area of technical advisory services, there are capacities installed in the municipalities through PRODESAL. In the area of the machinery acquired, it will be transferred to the municipalities as a bailment. It is indicated that the Regional Government will transfer resources for the maintenance of this equipment at first (which could not be confirmed in this way). In component 2, the existence of the working tables and WhatsApp groups is known, but there is no certainty of their continuity".

In terms of capacities to adapt to climate change, it is estimated that progress was made, for example, the incorporation of forage plants that were not used (Triticale), more efficient crop methods or crop rotation that makes better use of water. Incorporation of sheep. However, it was mentioned that "*Capacities remained, but not the resources to continue*". Another interviewee considers that "*adaptation capacities may have been diluted, there was a lot of emphasis on investments, and producers wanted to have access to it, but there were not many capacities left to incorporate sustainable practices over time*".

In some municipalities there was more capacity building, at least in those closest to the project.

However, resources are needed to give continuity to the project and all efforts in this regard have been unsuccessful. It is mentioned that efforts were made to raise resources with the Regional Government, specifically to finance the continued use of the agricultural machinery acquired under the project, but so far there is no record that this has been approved. However, there were no formal actions aimed at the continuity of the project, only rather individual initiatives.

Many interviewees see the issue of machinery as a problem; it is not clear how the continuity of this activity will be financed and whether the municipalities will be able to manage it.

Impact and results.

The farmers became aware of water through the rainwater collectors, they could even refill them and make more efficient use of water, they became aware that rainwater was useful to them. As for the machinery, they saw that with techniques appropriate to their soil conditions, it allowed a better use of water and soil, they saw their production improve with the incorporation of mechanization.

The main results obtained refer mainly to the installation of the topic "Climate Change" in small producers and local support institutions. In addition to the results related to techniques and technologies, in the last third of the project, agroclimatic issues and the rescue and enhancement of vernacular knowledge were also strongly incorporated.

For the interviewees, it can be said that most of the technologies were adopted, since they focused on the problems affecting subsistence in rural areas. The objectives were met, in that the goals proposed in the project were achieved through the implementation of subcomponent 1.2, which basically consisted of the installation of infrastructure (water harvesters, greenhouses, technician irrigation, renewable energies) and technological advances (soil tillage, changes in seeds resistant to water stress, sheep management plans, among others) in the 558 direct beneficiaries. However, it was not observed that there were no installed capacities to give continuity to the project *"There were no alliances that would allow the project's objectives to be projected into the future"*.

It is mentioned that the project did not generate a "School" with the local advisory teams for the dissemination of knowledge generated in the implementation of the project. "The latter is very important because the information generated as a result of the implementation of the activities does not travel to other levels because the "vehicle" for this is the local team, which is not empowered". It was assumed that the local teams (read INDAP and its programs) were the natural heirs of the process installed by the project. However, this did not happen in a decisive way, because the political reading of this project was not properly carried out.

Stakeholders' assessment of the project.

In the opinion of the interviewees, INDAP and PRODESAL were key in the design of the project, but their participation was diluted during its execution. In terms of project participation, they joined the project as much as possible, but in most cases out of personal interest rather than because they were involved in the project.

At the beginning there was not much coordination and the farmers received double advice, so it was very important to be involved in the project. Coordination worked to the extent that the professionals were known in the territory.

INDAP asked to participate or at least to have information on what was being done in the project, there were commitments to solve it, but there was no response. *"At first they told him that they could be part of the technical unit, but in practice it did not materialize."*

There were decisions beyond the technical criteria. *"This fact generated important delays in the installation of the infrastructure committed in the project, generating problems in the quality of its construction. Other problems arose in the quality of some of the machinery acquired, which had to be replaced again".*

Regardless of everything, the evaluation is positive, and the tools that remained with the farmers have been rescued. Now there is more awareness on the part of the farmers, they value a more sustainable agriculture. They are concerned about the soil, the environment, as a sector where they live (they are more aware of their surroundings). They have changed their view on the use of water and soil. It is even observed that they have maintained some management over time.

The use of machinery had a greater impact than expected.

With the implementation of the project there was a positive impact that is perceived at the beneficiary level, because they installed (water harvesters, greenhouses, technified irrigation, renewable energies) and implemented technological advances (soil tillage where it was possible to improve yields), which contributed to technological adoption and improved production yields, which ultimately led to an improvement in the well-being of the beneficiaries.

Regarding recommendations made by stakeholders:

- Regarding machinery, try to distribute an equal amount of equipment for each commune.
- Improve decisions on the type of machinery to be acquired and provide training to demonstrate its operation (for example, zero tillage).
- As for the agroclimatic modules and tables, improve their implementation and ensure correct and timely delivery of information.

Analysis of the strengths and weaknesses of the project.

Based on the analysis of the information gathered in the project, internal work was carried out to identify the project's strengths and weaknesses.

Regarding the strengths, it can be mentioned that there is an important institutional learning. For both AGCID and MINAGRI, this project marks a milestone in the possibility of continuing the execution of large-scale projects and implementing concrete actions aimed at adapting to climate change in the agricultural sector.

Another aspect to highlight is the experience of working between institutions, bringing to the table the capacities of each institution and at different scales (national, regional, local). This is how the environment, agriculture and a financing entity coordinate for a common objective and give way to the territories to take up the issue, which coordinate their entities, achieving the awarding of an initiative that benefits them all. Although this was a strength at the time of design, it was diluted in the execution of the project.

The methodology, through demonstration units, is always a good way to transfer new technologies.

As for the execution itself, the project leaves installed technology, knowledge, some articulations between actors in a territory highly affected by the effects of climate change, especially in terms of availability of water resources, soil problems, as well as the incidence of extreme weather events.

The capacity to face project implementation under a pandemic scenario was also a strength of the project.

As a result, the project leaves a group of farmers in the coastal drylands of the O'Higgins Region with tools to diversify their food diet, improve their yields, and ultimately to better face the effects of climate change and their resilience.

The following is a summary of the project's strengths:

Project strengths.

- The national and regional multisectoral perspective in the design of the project.
- Ability to coordinate and combine efforts of different entities towards the same goal, this was promoted or forced by the project. The synergy was important.
- Availability of INDAP in the selection of beneficiaries from the design of the project.
- For one group, the demonstration units were very positive.
- Technological change (greenhouses, tillage, photovoltaic, harvesters).
- The machinery and facilities that will remain in the territory.

- Improved yields due to the use of the machinery.
- Technological change and increase in forage. Triticale incorporation.
- The structure during execution, which contemplated different areas: administrative, social, monitoring, and financial, with INIA's technical support areas. Once this structure was consolidated, it was a strength for the good development of the last part of the project.
- Diet diversification.
- Self-consumption and healthy eating. Year-round availability.
- More organic management.
- Participation of women.
- Installation of the topic of climate change and its forms of adaptation in the communes of the coastal drylands.
- Value of advice and accompaniment during project implementation.
- The number of resources, which allowed for good deployment in the territory, the teams were able to be in the field, and personalized attention was provided.
- At the institutional level, project implementation was a tremendous learning experience for AGCID and for MINAGRI on how to do or not to do certain things.
- It established the idea that despite the conditions of the coastal drylands, it is possible to reverse this. It leaves a feeling of hope that things can be reversed.

Weaknesses of the project.

This point is addressed from different areas of project implementation, from design to sustainability.

The main aspects identified as weaknesses of the project have to do with its design, where the most relevant aspect is the lack of a more social and environmental focus, placing the farmers at the center, both in the governance and structure of the project, as well as in its execution.

On the other hand, there was a lack of a single leadership and a light structure that would allow information and project management to flow and facilitate decision making. Such leadership should not be linked to political changes.

A project of this magnitude should be presented with a clear methodological detail and consider the availability of capacities for its good execution.

The articulation between actors was another limitation, where in the end the actors of the territory itself (INDAP, PRODESAL) were not considered, nor were the beneficiaries in many aspects of project implementation, leaving it as an initiative isolated from the organizational structure of the territories.

Although there was a significant presence of technical teams in the territories, problems were identified at the time of installing the technologies. It was mentioned that there was a

lack of supervision of the installations and a lack of clear details in the technical specifications requested from the service providers. This generated many inconveniences that finally affected the beneficiaries.

During execution, there was a loss of focus and orientation to meet the needs and reality of the beneficiaries with activities and goals, in this sense there was no intervention strategy.

Finally, regarding sustainability, it is identified that it was not considered from the design stage, and there were no actions in this regard during implementation. It was left until the end of the project, which has meant that many of the project components are at a standstill until the handover and continuity of these (mainly machinery) is resolved.

Below is a detail of the main aspects identified as weaknesses of the project:

Design.

- Design based on a productive diagnosis, lacking social and environmental emphasis.
- Failure to consider a time frame for project start-up and closure.
- The design of indicators and goals in the design was weak and lacked a social scope.
- Failure to consider a sole manager with exclusive dedication.
- The characteristics of the person in charge of the management unit were not better defined (in the design).
- It was formulated and then spent a long time in execution. This could have been included in the mid-term evaluation. Not enough use was made of this evaluation to make changes.
- The untimeliness of the targeting. it was designed in a different context.
- The design of component 2 did not consider the realities of the producers, it was more academic.
- Ability to measure if the executor has the capacity (thinking about the experience with INIA), it is an intensive project. It should be reflected in the formulation.
- It was executed very late, there were investments that were made at the end.
- The design did not consider the sustainability of components 1 and 2.
- Lack of targeting, there were those (farmers) who had the services and did not necessarily need them.
- Transfer was not considered in the project design.

Governance.

- The governance structure was complex and rather hindered the processes and delayed the project a lot.
- Empowering regional authorities was a mistake. Seremi in charge of the project was not a good decision.
- The governance was confusing, some issues were in charge of INIA, others the SEREMI of Agriculture and others the Undersecretary of Agriculture in Santiago.

- There was no local participation in governance.
- INDAP was left out of decision-making processes.
- There was a lack of communication, information did not circulate.
- The user is left out of governance; he is not the center.

Project implementation.

- There was a lack of project induction for technical teams and beneficiaries.
- No todas las instalaciones fueron de la misma tecnología o calidad.
- Not all installations were of the same level of technology or quality.
- Regarding technical training, there was a lack of emphasis on sustainability aspects.
- The removal of technical and professional teams (there were very committed people and suddenly they were removed), delayed the processes.
- Changes in technical advisors made the relationship with beneficiaries more difficult.
- There was no clear criterion for deciding which beneficiary would receive which technology.
- Lack of machinery management, which ensured its timely availability and did not ultimately affect crop productivity.
- Lack of targeting (there were those who had the service and did not necessarily need it).
- Execution of purchases. Technical specifications were not adequate (machinery, photovoltaic panels).
- Problems with contractors, poor execution of their work.
- There was a lack of supervision by the technicians at the time of installing the technologies on the farmers' properties.
- Visits by the project's technical team were greatly reduced.
- The implementation of the project components with different entities (INIA, SEGRA), without a single direction, hindered the development of the project.

Articulation of Actors.

- There was articulation, but with resistance.
- Somewhat articulated with other entities.
- There was no interaction among governance committees.
- Relevant local stakeholders were not taken into consideration in the articulation (they were consulted, but not involved), as was the case with INDAP.
- The articulations were not left in place to function post-implementation.

Results.

- Not all the Demonstration Units were applicable to the real situation of all farmers.

Sustainability.

- There was no articulation design for the sustainability of the project.

- Not all beneficiaries were left with the tools or capacities installed to continue using the technology received.
- There were no links with the local ecosystem to continue with the work that was being done in the framework of the project.
- In a certain way, INDAP and PRODESAL are left with the burden of continuing the investments made.
- As for machinery, there is no transfer model and today it is not being used by farmers in the territory.
- Machinery can be a problem in the municipal administrations (transfer model on which they would be transferred).
- There was no clear transfer strategy in all components (observatory, machinery).

Analysis of the social and institutional lessons learned from the project.

In relation to the interviews that were carried out, on this aspect it is indicated that from a more social point of view, the project lacked this look at the time of its design. It is mentioned that *"It was not possible to incorporate a more social perspective to the project, it was not possible to select the direct beneficiaries of the project more carefully, which finally resulted in the need to make adjustments and a reformulation of the project"*.

In this regard, it can be indicated that the project presented some difficulties at the time of its implementation, because of a 2-year delay in the start date, which generated on the one hand the need to rethink the search for the direct beneficiaries of the project, given that much time had passed since the first approaches were made with the potential users. As a result, some farmers stopped believing in the implementation of the project, others migrated from the territory to other towns or cities, and in some other cases the potential beneficiaries died.

In relation to the social practices of the project, it can be established that in some aspects of the project there was a lack in the implementation of the technological practices adopted by the farmers, as well as in the technical advice given to carry them out, and this lack can be seen as the absence of a multidisciplinary approach in the implementation of the technological packages with the beneficiaries of the project.

This could have resulted in a better technological adoption by the beneficiaries, in order to make the use of the acquired technology more sustainable, even though in the surveys applied in the final evaluation process, a high percentage of the direct beneficiaries indicated that they make use of the materials and tools provided by the project (90.7% of those surveyed indicated that they use their materials and tools).

One aspect in which there was little social development has to do with the low level of associativity of the project beneficiaries, given that only 16.3% of them indicate that they

belong to a producers' organization. Undoubtedly, in the context of an environmental crisis, collaboration networks and joint work among peers could be a way of strengthening local adaptation and resilience capacities, but this did not occur, since the project did not seek this type of objective.

Regarding the institutional level, it can be indicated that there were different actors at the local, regional, and national levels that participated in some way in the execution of the project, and on which some reflections on the main learnings in these institutions at their different territorial levels can be established.

From the local level:

- Municipalities had the possibility of participating in some coordination instances for the execution of the project, with greater or lesser intensity, but the fact of not being able to effectively influence the course of the project perhaps weakened this participation over time. Despite this, there were municipalities that actively supported the development of the project, and in some other cases, benefited from it in relation to the provision of technology in municipal or educational spaces.
- INDAP, at the level of area agencies, played an important role in the design and start-up stage of the project, and it is even considered that they could have been a good executor of the project for the materialization of the technologies considered by the project; however, as with the municipalities, the participation of the local INDAP decreased as the project progressed, becoming only collaborating actors for certain moments of project execution in the territory.
- INDAP programs, in this case, the PRODESAL program is of great importance for project implementation, as most of the direct beneficiaries come from this program in all the communes. The other program involved in project implementation is the TAS (technical advisory service), also from INDAP; however, the technical teams of these programs were less involved in project implementation, despite the fact that at the end of the project, the vast majority of INDAP's farmer users continue to receive technical assistance from these programs.

From the regional level:

- At this level it is identified that the governance model could have been much better in that some entities could have been better articulated with the project management unit, and this is what happens with INDAP, CONAF, Seremi of Environment, and other services that could have complemented in a very good way the implementation of the project. The main learning at this point is precisely an adequate analysis of governance and the ways in which the different regional actors can contribute and complement the development of a project of this size.
- The active participation of more regional actors could have enriched the implementation of the project much more, assigning specific roles in which each public agency could contribute to the development of the project, including in among

others INDAP, Seremi of Environment, CONAF, SAG, PRODEMU, Regional Government.

From the national level:

- Better articulate the actors linked at the national level with the execution of the project at the local level, since there is evidence of a lack of presence of national entities in the implementation of the project at the local level, which could have been influenced by the deficiency in the governance model of the project, and the assignment of management responsibility at the regional level to an entity whose main role is political and not technical.
- The project provides important lessons on how to improve from the design of initiatives of this magnitude to their implementation and assignment of responsibilities. Institutionally, the necessary reflections should be made to avoid repeating mistakes throughout the project execution chain, to make a critical review of the experience and to take the difficulties obtained to transform them into opportunities for improvement for future initiatives.
- Even actors who were not directly involved in project implementation have learned lessons that could be used to improve future projects, as was the case with INDAP, which despite its distance from project implementation, is identified as a very relevant entity for the implementation of a program such as this one. In the past INDAP has fulfilled this role, and this is what happened in the 1990s and early 2000s with internationally funded programs such as Prodecop-Secano in the O'Higgins, Maule and Biobio regions, Prodecop in the Coquimbo region, among other initiatives.

V. Final recommendations.

According to the evaluation process carried out, considering a detailed review of the available secondary information background of the project, as well as in consideration of the primary information gathered during the period of the consultancy, and considering the demanding urgency in the delivery of this report, the following reflections can be indicated as final recommendations of the analyzed project, separated in different perspectives of analysis.

1. From the Project Design perspective.

- In terms of **design**, the incorporation of cultural and technical elements associated with agricultural practices is recommended, especially considering their relevance in aspects of social cohesion that impact on the preservation of local activity, considering:
 - a. Establish a combined relationship of a retrospective and prospective analysis that allows determining and building adaptation measures to face climate variability, based on the impacts on local agriculture generated from the result produced by climate change.
 - b. Incorporate climate risk management as a structuring axis in adaptation actions, with a systemic approach at the local level, but with an adequate implementation in the perspective of the implementation opportunity (the project implemented this component with a significant time lag).
- Design the planning of a project of this size with a structured approach as provided by the Logical Framework Matrix (LFM), focusing on the user as the subject of intervention, including a diagnosis of the problems to be solved and the associated solutions, with transdisciplinary approaches, both in the agronomic, social, anthropological, and environmental fields, as well as cross-cutting aspects of gender and territory.
- Design indicators that comply with the SMART condition, which states that an indicator must be Specific, Measurable, Achievable, Realistic and Time-bound.
- Consider the design of intermediate results indicators of the dimension of economy, effectiveness, efficiency, and quality to measure the achievement of the Purpose such as:
 1. Economy: Percentage of Project Budget Execution.
 2. Efficiency: Total amount of resources invested per user. It is suggested to obtain this indicator with a gender focus.
 3. Effectiveness: Percentage of population served by the project (Coverage).
 4. Quality: Percentage of outstanding ratings on a scale of 1 to 7 with respect to the project's performance among users (in this indicator it is necessary to set an initial goal, for example, 75% of users rate the project's performance

between 6 and 7). It is suggested that this indicator be obtained with a gender focus.

5. Effectiveness: Number of households with water installed for their productive and/or consumption system with respect to year 0.
 6. Effectiveness: Increase in beneficiaries' income, disaggregated by gender, with respect to year 0.
 7. Effectiveness: Number of female heads of household who are intervened by the project.
- Having clarity in the indicators to be measured, it is recommended to have a periodic measurement system and valid and quantifiable means of verification such as the construction of a database to monitor the progress of the project.
 - Consider a probabilistic system to address the risks that could be faced in the implementation of a project.
 - Consideration of an adequate Governance model from the Project or Program Design stage, which establishes, before the start of the project, the roles and responsibilities to be carried out by the different levels of project management: Local-communal, regional and national. This consideration, established from the beginning, could facilitate the correct implementation of future projects, considering in this model that there is an adequate integration in the participation of the different actors involved. The same governance should establish and define the operational and management role of the project, under a management model.
 - At the time of designing the project, a clear closure strategy should be considered, which will allow for the implementation of strategies during project execution to ensure the future sustainability of the different components that make up the project, as well as defining strategies and models of future operation for those components that are related to the installation of technologies to be made available for the benefit of the target population (machinery for use by farmers).
 - In relation to project design, the best strategies should be taken into consideration that will allow the project to be executed correctly and in effective coordination with other local and regional stakeholders. In this sense, it is recommended that the execution be considered using the best available capacities at the institutional and territorial level for a correct and better implementation. For example, one of the implementation options that existed with respect to this project was that it be implemented through the installed capacities of INDAP, but this did not occur, however, at the close of the project it is considered that it is the most relevant actor to give continuity of use to the available infrastructure and the demands for technical assistance. In this sense, having implemented a project in parallel to the existing capacities in the territory without greater articulation and connection leaves a feeling

of emptiness on this point, without an adequate handover process to the more permanent institutions in the territory.

- It is important that in the design of a project of this size (ambitious objectives and results), the technical and management capacities of the executor(s) are clearly contemplated, as well as the availability of sufficient time to achieve the project's results. In this case, INIA was in charge of the technical execution of the project, presenting difficulties to achieve the objectives they had committed to as a result of the multiple initiatives they execute in parallel, leaving them with very reduced specialist time, affecting the development of some activities, assuming a high cost of opportunity (such as the soil laboratory, according to one of the interviewees).

2. From the Implementation perspective.

- There is a certain consensus on the part of the interviewees in mentioning the importance of having a project manager with the capacity to move the teams and focused on the project objectives and compliance orientation. The governance of the project did not work well and could have been installed in a more articulated way to the functioning structure of the state institutions, given that after the project this is lost.
- Some aspects to be considered in future initiatives are the following:
 - Avoid the long time elapsed between the formulation of the project and its implementation.
 - Incorporate a social perspective in the design and execution of the project.
 - Improve the socialization of the project to improve targeting in the communities.
 - To review and prioritize the recommendations and technical decisions in the execution of projects of these characteristics.
- As one of the interviewees indicated: *"The project was good, in general, but it could have had a much better impact on the territory, the beneficiaries and the institutions"*.
- In relation to the gaps in infrastructure installation supervision, the following can be indicated:
 - As a first element, it should be considered the supervision of those companies that have been subcontracted to generate infrastructure works such as: greenhouses, rainwater harvesters, installation of photovoltaic panels.
 - This is due to the fact that there is not total satisfaction with what has been delivered and installed in this project, although most of the beneficiaries indicate that they are satisfied with what has been delivered, it was noted in the

community workshops that in some cases the contractors worked with a certain haste and sometimes without responding to the needs of the beneficiaries.

- One of the most complex elements in these programs is the generation of an effective information model and therefore transversal to all beneficiaries. In this regard, in the future, the following issues must be addressed with precision:
 - Clearly informing the objectives of the program and making even more explicit the benefits that people can receive, especially due to the late entry of beneficiaries into the program (which occurred towards the end of the project).
 - Consider a fast and effective information system, understanding that many of the beneficiaries do not have permanent access to social networks or the internet, especially in relation to training (radio programs, information capsules via WhatsApp, among others).
- Regarding the use of agricultural machinery acquired by the project, the following can be indicated:
 - The machinery service needs to be rethought in the future, since it is currently necessary to generate a management model so that this equipment can continue to be used by farmers in the project's impact communes.
 - Although the service during the project implementation stage was free of charge, it is necessary to rethink this, given that any model for transferring this equipment (handing it over to local municipalities, as in this case) requires a budget to cover the high maintenance costs of this machinery. In the closing of this project, it is proposed to deliver the machinery to the municipalities and to negotiate with the Regional Government resources to support their maintenance, but this is not sustainable over time.
- Prepare periodic executive reports on the progress of planned activities and the project's budget execution, in order to make timely decisions to correct the course of its management. In addition, prepare annual purchase plans and bidding conditions that consider a schedule adjusted to technical and agronomic requirements.

3. From the Governance perspective.

For a project of this magnitude, it is essential to establish a good governance structure that must be simple and executive.

Among the components of the governance structure of the project, the SEREMI of Agriculture of the region was identified as the project leader, in order to empower the local

authority. This was ultimately a problem, since on the one hand it was difficult to allocate time from its role as a regional authority to take charge of a project of this size.

On the other hand, this situation took away continuity from the project, since the change of government also changed the direction of the project, altering its execution and also because the project was managed by the Seremi of Agriculture and INIA, which was in charge of the technical part.

Therefore, it is recommended that the governance of the **project be presided over by a project director with exclusive dedication and independent of political changes**. Then an administrative coordination unit to ensure compliance with the commitments and goals, and a technical coordination unit to ensure the proper technical execution of the project.

A recommendable figure for a project of this magnitude is the "*Territorial Poles of Strategic Development*" instrument (Foundation for Agrarian Innovation), where there is a strategic decision-making level composed of those executing the project and representatives of the beneficiaries, who are an additional partner in the project. There is also an advisory entity that accompanies project implementation, made up of representatives of the ministries and the financing entity, to closely monitor implementation. This includes the manager and the technical and administrative team.

Although the local committees, as part of the governance of the project, as an instance where farmers, representatives of the municipalities and representatives of agricultural organizations in the territory participated, was a great success and was in line with the above mentioned, it is recommended that this be maintained during the development of the project, establishing mechanisms of representation and participation, and that it be a real instance of co-creation in the development of the project.

On the other hand, it is recommended to improve **environmental or climate governance**, reducing and sharing risks collectively, adjusting natural systems as a real response to climate change adaptation, in this sense it is necessary to:

- a. A greater **public-private articulation**, in a binding rather than consultative manner, that enhances crop diversification, optimization and management of current farming systems.
- b. **Specificity and economic efficiency** of climate change adaptation options that integrate and consider both **cultural conditions and environmental standards**.

4. From the Sustainability perspective.

- In terms of **sustainability**, it is necessary to reduce the asymmetry in the adoption of technological packages in the CFA, altering social and generational behaviors with respect to adaptation to climate change:
 - a. To highlight the role of the territory in practices that allow the sustainable development of the CFA, based on the articulated integration of technological supply, highlighting the need for diversification in the productive systems, through the recovery of traditional crops, as well as the incorporation of new varieties that present a greater adaptation to climate change.
- Continue to support beneficiaries through participating institutions such as INDAP and its programs, PRODESAL, SAT and INIA, since, despite the progress made, they continue to be highly vulnerable in this sector of the drylands.
- Reactivate the delivery of agroclimatic information through the RAO, with an emphasis on dissemination that is understandable to the regular user, considering in this redesign the participation of users in the drylands.
- In the case that technical assistance continues through INDAP and INIA, it is suggested to encourage associativity to promote collaboration between community peers and neighbors to promote technological adoption and improve the quality of life of people living in the same territory.

VI. Annexes.

Annex I. Logical Framework Matrix – Original Project

Logical Framework Matrix - Original Project (1 of 4)

Objective/Results	Indicator	Base line	Project final goal	Verification methods	Risk and assumptions	Responsible	Associated resources
<p>Project Objective: Improve the resilience capacity of the rural agricultural communities in the coastal and inland rainfed areas in the O'Higgins Region, regarding the current climate variation and the future climate change.</p>	<p>Number and type of the institutions with the better capacity to minimize the exposition to the climate variability risks. Number of persons with less risk of extreme climate events.</p>	<p>Degradation of agricultural and livestock land due to improper practices. The younger generation migrates from family farms in search of better economic and working conditions and a better quality of life.</p>	<p>Soil degradation is reduced through the application of soil conservation techniques and appropriate soil, water and vegetation management practices.</p> <ul style="list-style-type: none"> - 13 institutions (5 services of the ministry of agriculture and 8 municipalities) with increased capacity to reduce exposure to the risks of climate variability. - At least 225 officials from 13 institutions (5 services of the Ministry of Agriculture and 8 municipalities) trained to minimize exposure to the risks of climate variability. - 558 landowners (direct beneficiaries, at least 318 women) with reduced risk to extreme weather events. 20,000 liters of water per year available per landowner. Household income increased by at least USD 1,000/year. -At least 2208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5,000 hectares with improved soil quality. Household income increased by at least 1,000 USD/year. - At least 4988 landowners (100% of the farmer population, direct beneficiaries, at least 1562 women) with reduced risk of extreme weather events (EWS 0->3). - At least 5343 (direct beneficiaries at least 1673 women) farmers trained. 	<p>Project reports: Access registration, messages registration, trainings, and direct interviews registrations.</p>	<p>Assumption: The exchange rate CLP/USD remains above \$550 CLP.</p>	<p>MINAGRI</p>	<p>9,009,999</p>

Logical Framework Matrix - Original Project (2 of 4)

Objective/Results	Indicator	Base line	Project final goal	Verification methods	Risk and assumptions	Responsible	Associated resources
<p>Component 1. Technological support and training to improve the agricultural practices with respect to agricultural threats to soil, water, crop management and livestock.</p>	<p>13 institutions (5 services of the ministry of agriculture and 8 municipalities) with increased capacity to reduce exposure to the risks of climate variability.</p>	<p>The cultivable area in the O'Higgins region will be reduced in 44% and 68% respectively (scenario A2). The most vulnerable agricultural group under than 20 ha) includes 4988 farmers (1562 women) and their families.</p>	<p>Increased capacities for soil management, livestock, water, and crops. Community access to soil tillage machinery.</p> <ul style="list-style-type: none"> - 13 institutions (5 services of the ministry of agriculture and 8 municipalities) with increased capacity to reduce exposure to the risks of climate variability to a minimum exposition. - At least 225 officials from 13 institutions (5 services of the Ministry of Agriculture and 8 municipalities) trained to minimize exposure to the risks of climate variability. - 558 landowners (direct beneficiaries, at least 318 women) with reduced risk to extreme weather events. 20,000 liters of water per year available per landowner. Household income increased by at least USD 1,000/year. -At least 2208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5,000 hectares with improved soil quality. Household income increased by at least 1,000 USD/year. - At least 5,343 direct beneficiaries, at least 1,673 women, trained farmers. 	<p>Project Technical reports, annual reports, mid-term, and final evaluation. Training registration.</p>	<p>Risk: The climate change has a greater intensity than projected by the analysis and studies.</p>	<p>MINAGRI</p>	<p>8,603,251</p>

Logical Framework Matrix - Original Project (3 of 4)

Objective/Results	Indicator	Base line	Project final goal	Verification methods	Risk and assumptions	Responsible	Associated resources
<p>Result 1. Implementation of a training and capacity building system to increase the resilience of vulnerable farming communities to climate variability and climate change with respect to soil, crop, livestock, and water management.</p>	<p>1. Number of officials trained to answer and mitigate the impact of climate events. 2. Capacity of officials from selected institutions to answer and mitigate impacts of increased climate events.</p>	<p>Low level to technical access and financial assistance. Low level of connection with the agro-industrial value chain and low participation in organizations.</p>	<p>- At least 225 officials from 13 institutions (5 services of the Ministry of Agriculture and 8 municipalities) trained to minimize exposure to the risks of climate variability. -At least 2,208 farmers (direct beneficiaries, at least 691 women) with increased access to machinery and technical assistance. At least 5,000 hectares with improved soil quality. Household income increased by at least 1,000 USD/year. - At least 4,988 landowners (100% of the farmer population, direct beneficiaries, at least 1,562 women) with reduced risk of extreme weather events (EWS 0->3). - At least 5,343 direct beneficiaries, at least 1,673 women, trained farmers.</p>	<p>Project reports: Technical reports, annual reports, mid-term, and final evaluation. Direct beneficiaries' surveys.</p>	<p>Risk: The government and the institutions do not assign sufficient priority to the program.</p>	<p>MINAGRI (INIA)</p>	<p>5,297,781</p>
<p>Result 1.2 Management support of agro-climatic information for current climate and future climate changes for local MINAGRI professionals and farming communities.</p>	<p>Number of affected people by the climate variability.</p>	<p>Limited productive capacity. Small farmers face water shortages from November to April. They receive water in tanker trucks from the municipalities, but in insufficient quantity to maintain agricultural activity.</p>	<p>- At least 4,988 landowners (100% of the farmer population, direct beneficiaries, at least 1,562 women) with reduced risk of extreme weather events (EWS 0->3). - 558 landowners (direct beneficiaries, at least 318 women) with reduced risk to extreme weather events. 20,000 liters of water per year available per landowner. Household income increased by at least USD1,000/year. - At least 225 officials from 13 institutions (5 services of the Ministry of Agriculture and 8 municipalities) trained to minimize exposure to the risks of climate variability.</p>	<p>Project reports: Technical reports, annual reports, mid-term, and final evaluation. Direct beneficiaries' surveys.</p>	<p>Risk: Lack of incentives or beneficiaries' economic capacity to invest in the restorations or improvements, may lead to ineffective land use and expected results.</p>	<p>MINAGRI</p>	<p>3,305,470</p>

Logical Framework Matrix - Original Project (4 of 4)

Objective/Results	Indicator	Base line	Project final goal	Verification methods	Risk and assumptions	Responsible	Associated resources
<p>Component 2. Implementation of an information system for the agroclimatic irrigation management and adaptation to climate change.</p>	<p>Percentage of population covered by adequate risk reduction systems.</p>	<p>Small farmers present a lack of agro-climatic information and skills for agricultural decision making in climate change and extreme environments.</p>	<p>Adequate information is generated and disseminated through the appropriate media services. Together with the information, it improves decision making. - At least 4,988 landowners (100% of the farmer population, direct beneficiaries, at least 1,562 women) with reduced risk of extreme weather events (EWS 0->3). - 13 institutions (5 services of the ministry of agriculture and 8 municipalities) with increased capacity to reduce exposure to the risks of climate variability to a minimum exposition.</p>	<p>Project reports: Technical reports, annual reports, mid-term and final evaluation. Access and registration to messages.</p>	<p>Risk: 1- The beneficiaries are resistant to change in practices. 2-The government and the institutions do not assign sufficient priority to the program.</p>	<p>MINAGRI (UNEA)</p>	<p>406,748</p>
<p>Result 2.1 Implementation of measures and technologies to increase the availability of water resources for rural communities in the coastal and inland drylands of the O'Higgins Region.</p>							

Source: Original Climate Change Project.

Annex II. Climate Change Project: Budget Execution.

Objective/Result	Original budget (Expressed in USD)	Available budget (Expressed in USD)	Executed budget (Expressed in USD)	Δ Original budget/ Available budget	% Executed budget/ Original budget	% Executed budget/ Available budget
Project Objective: Improve the resilience capacity of the rural agricultural communities in the coastal and inland rainfed areas in the O'Higgins Region, regarding the current climate variation and the future climate change	9,960,000	9,960,000	9,286,379	0,00%	93.2%	93.2%
Component 1. Technological support and training to improve the agricultural practices with respect to agricultural threats to soil, water, crop management and livestock.	8,603,252	8,082,665	7,496,553	-7.0%	87.1%	92.7%
Result 1. Implementation of a training and capacity building system to increase the resilience of vulnerable farming communities to climate variability and climate change with respect to soil, crop, livestock, and water management.	5,297,781	5,091,777	5,029,964	-7,0%	94.9%	98.8%
Result 1.2 Management support of agro-climatic information for current climate and future climate changes for local MINAGRI professionals and farming communities.	3,305,471	2,990,888	2,466,589	-7.0%	74.6%	82.5%
Component 2. Implementation of an information system for the agroclimatic irrigation management and adaptation to climate change.	406,748	341,700	317,325	-7.0%	78.0%	82.5%
Result 2.1 Implementation of measures and technologies to increase the availability of water resources for rural communities in the coastal and inland drylands of the O'Higgins Region.						
Execution cost	450,000	1,035,636	1,035,636	56.5%	230.1%	100.0%
Management Fee charged by the implementing entity	500,000	500,000	436,865		87.4%	87.4%
Management Fee	4.5%	10.4%	11.2%			

Source: Original Climate Change Project 2017; Final Report 2023.

Annex III. Community Workshop.

The community workshops were carried out according to the following Schedule, during June 2023.

June 2023				
Monday	Tuesday	Wednesday	Thursday	Friday
			1	2
			La Estrella, 10:00 AM	
5	6	7	8	9
	Paredones, 9:00 AM Marchigue, 10:00 AM Lolol, 15:00 AM		Navidad, 10:00 AM / Next to Arts Hall	Pichilemu, 10:00 AM / Auditorium Room
12	13	14	15	16
	Pumanque, 10:30 AM		Litueche, 10:30 Am	

Attendance list of La Estrella community workshop.



LISTADO DE ASISTENCIA - ACTIVIDAD: Taller focal - La Estrella FECHA: 1/06/2023
Proyecto cambio climático

Nº	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	Rosa Rubio Lagos	San Gabriel	994609831	Rosa Rubio
2	Manuel Casero	El Pihuelo	94021.13.31	emey
3	Victoria Pino Lecón	La Estrella	993765775	[Signature]
4	Jessica Villegas Saravia	La Estrella	+56939155922	[Signature]
5	Jorge Navarro	La Estrella	985360820	[Signature]
6	Olga Inés Obregon	El Pihuelo	999505016	[Signature]
7	Alfredo Osorio	El Cajón	+56944292337 osorio.v.m@gmail.com	[Signature]



N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
8	Amanda B. Carallo O.	La Aguada SW	965070224	<i>A. Carallo</i>
9	Maria Vial (Serio)	LA AGUADA.	11786568-1	<i>Maria Vial</i>
10	MARIA LASES REYOS	LA AGUADA	950043077	<i>M. Lasés</i>
11	Maria E. Fuentes	La Estrella	989225129	<i>Maria E. Fuentes</i>
12	José Luis O.	La Estrella	976300423.	<i>José Luis O.</i>
13	Jorge Orellana	La Estrella	981762504	<i>J. Orellana</i>
14	LEONTINA CAMPOS	QUEBRADA DE LA VIRGEN	963072760.	<i>Leontina Campos</i>
15	Georgina Campos Estray	Quebrada de La Virgen		<i>Georgina</i>



N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
16	Viviana Lora	La Aguada	993764276	<i>Viviana Lora</i>
17	Glady Pino	La Pataguilla	985129380	<i>Glady Pino</i>
18	Alejandro Vargas	La Agueda	994154530	<i>Alejandro Vargas</i>
19	Janet Herrera Y	La Asueta.	969022674	<i>Janet Herrera</i>
20				

La Estrella community workshop pictures.



Attendance list of Navidad community workshop.

Cambio climático

LISTADO DE ASISTENCIA - ACTIVIDAD: _____ FECHA: _____

N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	Soriana Pizarro	CHINCHOS	98528614	Soriana Pizarro
2	CARLO G. PODEL	NAVIGAD	988484721	Carlo G. Podel
3	MARIO FLORES	PAINTEN	-	Mario F. Flores
4	HERNANDEZ SILVA I	PAINTEN	988552448	Hernandez Silva I
5	FELIPE AGUIRRE RAMIREZ	LICANICHEU	983496336	Felipe Aguirre
6	BENJAMIN CATALAN R	LICANICHEU	997765775	Benjamin C. P.
7	SILVIA DEZA SIMONOVIC	LICANICHEU	964664151	Silvia Deza
8	ANA MARIA TOZO	CENAHUELA	997568250	Ana Maria Tozo

cambio climático		INOVACC. RR	
9			
10	Enma Acenoso Sáenz Sa Origa de Pichuza	99 622 7074	Enma Acenoso
11			
12			

Navidad community workshop pictures.



Attendance list of Marchigüe community workshop.



LISTADO DE ASISTENCIA - ACTIVIDAD: Taller comunal Marchigüe. FECHA: 06/06/2023

N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	Jacqueline Leiva	Rinconada Alcones	983854386	Jacqueline L.
2	Blanco Contreras	Rinconada Alcones	74194579	Blanco al.
3	Luis GASTE ERAZO	PAI VMO	31752211	Luis Gaste E
4	José de la Cruz Gutiérrez Pérez	Marchigüe I-90	62812062	José de la Cruz
5	Julieta Leiva Fuente	Orinidad	61867707	José de la Cruz
6	Rosa Leiva Fuentes	Trinidad	97691434	Rosa Leiva
7	Victoria del Carmen Mardones Castillo	Junquillo 5/11	992611919	Victoria Mardones C.



N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
8	Juan José Espinoza López	Junquillo 5/11	990183550	Juan José Espinoza
9	Mary Luz Castille	Junquillo 5/11	996923357	Mary Luz Castille
10	Daniela Sarmiento 2	El Chiguín 1/11	daniela8376@gmail.com 997942936	Daniela Sarmiento
11	Marta Zúñiga Castro	Yebos Buenos	81996226	Marta Zúñiga
12	Alyson Rojas	Malleno	976622079	Alyson Rojas
13	Blanca Vargas D.	Alcones	999125215	Blanca Vargas
14	Margarita V. del Reyas	San Miguel U. Luro	985485010	Margarita Vid
15	Juan Contreras Vidal	Pailimo	975104117	Juan Contreras



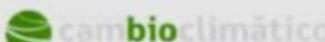
Nº	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
16	Milca CAMARA JARA	PILUCHE	07 5486 55 74 camara milca 066 @greta	
17	Joaquín Becerra Viqueo	Av. Los Molinos s/n Marchigue	932121736 J.becerra@GMAIL.COM	
18	Rana Gulufo	La Cumbre	958323473	
19	German Corzojo	Marchigue	88615185	
20	Juan Pablo	Marchigue	995848-4	
21	Juan Pablo	Marchigue	959669653	

Marchigue community workshop picture.



Attendance list of Litueche community workshop.

 				
LISTADO DE ASISTENCIA - ACTIVIDAD: <u>Taller Comunal Litueche</u> FECHA: <u>15/06/2023</u>				
N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	MANIA MORALDO M	MATANCILLA	994466453	<i>[Signature]</i>
2	Andrés H. Amigo C.	Abispo Layan 1833 - Litueche	933403977	<i>[Signature]</i>
3	Hiram Rubio S.	Litueche	972974966	<i>[Signature]</i>
4	ERITOCARRIO G	Pelú	94477877	<i>[Signature]</i>
5	Elvira Salas	Litueche	9.504.023-3	<i>[Signature]</i>
6	Remigio Cáceres	Manquehue	981255404	<i>[Signature]</i>
7	Luís González U	Manquehue	975470490	<i>[Signature]</i>

 				
N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
8	Alba Espinoza M	Bonvicente Paredón	990336556	<i>[Signature]</i>
9	Carolina Puyalt Puyalt	El Cuyco	985519348	<i>[Signature]</i>
10	Esperanza Hernández Cerros	Matancilla	97192230	<i>[Signature]</i>
11	Oscar Morales M	Litueche		<i>[Signature]</i>
12	Enrique Leiva A	Matancilla	997819380	<i>[Signature]</i>
13	Anna Linares Domínguez	Litueche	993404242	<i>[Signature]</i>
14	G. M. González Soto	Asunción	994295954	<i>[Signature]</i>
15				

Litueche community workshop pictures.



Paredones community workshop pictures.

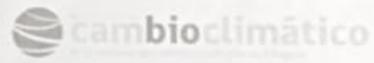


Attendance list of Paredones community workshop.

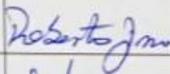
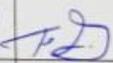
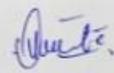
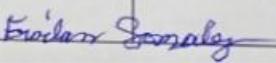
cambio climático		Paredones		
LISTADO DE ASISTENCIA - ACTIVIDAD:		FECHA:		
Nº	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	Maria Lopez Reyes	Corozalillo s/n	944329786	<i>Maria Lopez</i>
2	Zuzide Chang Navarro	11	994 030469	<i>Zuzide</i>
3	Idiliz Droppett	El Quilby	982954136	<i>Idiliz</i>
4	Eugenia Perez	El Peril	988634145	<i>Eugenia Perez</i>
5	Monica Castro	La Quebrada	996275485	<i>Monica Castro</i>
6	Orlando Parraquez	El Quilby	944060425	<i>Orlando</i>
7	José T. Fungelich	El Peral	996223435	<i>José T. Fungelich</i>
8	Osvaldo Gonzalez	La Quebrada	988470433	<i>Osvaldo Gonzalez</i>

cambio climático		Paredones		
9	Felipe Solís Ruiz	Paredones Prodesal	993441684	<i>Felipe</i>
10	Jairo Ortiz Guano	Paredones Prodesal	958889201	<i>Jairo Ortiz</i>
11	Nicolás Castro Lopez	Paredones Prodesal	990570054	<i>Nicolás Castro</i>
12	Carmen Parraquez Araya	PRODESAL	983284227	<i>Carmen</i>
13	Johnny Coronado Ordóñez	COORDINADOR T4	968488017	<i>Johnny</i>
14				
15	Elvira Coronado			





PARROQUIAS
 LISTADO DE ASISTENCIA - ACTIVIDAD: _____ FECHA: _____

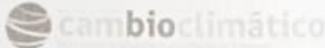
N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
9	Rosario Moya D	La Laguna	968079000 938729155	
10	Gladiys Parroquia	El rincón del Potosí	995643602	
11	Roberto Jimenez	El Calvario	997245897	
12	Anz Cortez	El Cardal	968050619	
13	Francisco Alameda Torres	La Laguna	934166820 - 92681724	
14	Mayra Paz Lopez	Cobecena	989261446	
15	Valeria Landaou Bonaur	El Peral	933186596	
16	FROILAN GONZALEZ	EL PERAL S/N	971471124	

Pichilemu community workshop pictures.





Attendance list of Pichilemu community workshop.

 LISTADO DE ASISTENCIA - ACTIVIDAD: _____ FECHA: _____

N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	MARIN LIZARRA O.	Panuel 3%	9 88502449	Marina O
2	Electrono Latorre P.	Panuel 3%	9 88502449	[Signature]
3	Jackeline Talabán	Caluít 5%	9 62800354	[Signature]
4	Pedro Muñoz	Padillo		Pedro m
5	[Signature]	Panuel		[Signature]
6	Rosario Pato	Panuel		Rosario Pato
7	Rosario Pato Espinoza			[Signature]
8				

Innovación

cambio climático

18	Sofia Cornejo Vargas	Loguil	976007042	Sofia C
19	Karen Vargas Farías	Cáhuil	983590099	Karen Vargas
20	Sabrina Vargas	Espinillo	985547606	Sabrina V
21	Yore Domil Parry	Espinillo	995660966	Yore Parry
22	Peono Corvelly	ROFEILLO	992811886	Peono Corvelly

Innovación

cambio climático

18	Jeanette Parry Vargas	Pichilemu	971785530	Jeanette Parry
19	Gloria María Pini	Pichilemu	978243217	Gloria María Pini
20	Alisio Jorgely	Pichilemu	973386164	Alisio Jorgely
21	Nelly Soto Retanales	Pichilemu	942694612	Nelly Soto
22	Joan Hugo	Pichilemu	983290748	Joan Hugo

cada Ases Pámul

Cornejo
Parry

Pumanque community workshop pictures.



Attendance list of Pumanque community workshop.

 **cambio climático**

LISTADO DE ASISTENCIA – ACTIVIDAD: _____ FECHA: _____

N°	NOMBRE Y APELLIDOS	DIRECCIÓN	TELÉFONO / EMAIL	FIRMA
1	Maria Lizana G.	Av. MARTE 1100	97262565	<i>Maria Lizana</i>
2	Juan Muñoz M.	La Villa S/N	0181275206	<i>Juan Muñoz</i>
3	Rosa Margarita LL	Q. N. R.	981275206	<i>Rosa LL</i>
4	Elio Galo P.	Q. N. R.	71 23 12 52	<i>Elio Galo</i>
5	Almendra Becerra D	Espejillos S/N	14-352 273 -3 .	<i>Almendra Becerra</i>
6	Maria Elena Lopez	Q. N. R.	12 012 214 - 2	<i>Maria Elena</i>
7				

Innovación

cambio climático

	Nombre	Sector	telefono	Firma
9	Yvonne Barroza C.	Orillo la Sibra	9.87806175	Yvonne Barroza
10	Berta González	Petate Blanca	995601533	Berta González
11	Adelina Parraquez P.	Hacienda Pumanque	932492138 89832929	Adelina Parraquez
12	Doris Aguado Galaz	hacienda Pumanque	9.19362928	Doris.
13	Rosa Barroza	hacienda Pumanque	99610169	Rosa Barroza
14	Emilia Valesquez	Hincón la Hina	931266240	Emilia Valesquez
15	Andrés Sánchez S.	Hincón la Hina	992350601	Andrés Sánchez
16	maria A castro	Hincón los flequeros	9.74743776	maria A castro
17	marcelina paco	La huacina	95891600	marcelina paco

Innovación

cambio climático

	Nombre	Sector	telefono	Firma
9	ana maldonado morales	Ranquillina	9.77163795	ana maldonado
10	Adriana Parraquez	Tilekumbuyo	9.34807439	Adriana Parraquez
11	Olivia Citrón de Diaz	Hincón los flequeros	9683695	Olivia Citrón de Diaz
12	Elisa Díaz	Hacienda	92681159	Elisa Díaz
13	José Pérez	Colhua	965802254	José Pérez
14	Sonia Díaz	La Gloria	99558478	Sonia Díaz
15				

Lolol community workshop pictures.



Attendance list of Lolol community workshop.

	cambio climático	lolol	innovacc/ón	
9	Yvnesa Espinoza	La Cabita Callejon La Higuera	977519667	Vauca
10	Rosy Duarte	La Cabita		Asa Luente
11	Dzpakob Durkoba	Vikahue Alto		
12	Ramon Zumbado		98889721	Diagnostico
13	Cludia Uzcua Roi Hector Rodriguez	Finca de la Cuchara	966484530	Diagnostico
14	Reinaldo Castro	Mejorada Lolol		Diagnostico
15	Gloria Ornelas	Raqueili		Diagnostico
16				

Summary of participants in community workshops.

Commune	Date	Number of participants
La Estrella	01-06-2023	19
Marchigüe	06-06-2023	21
Paredones	06-06-2023	22
Lolol	06-06-2023	7
Navidad	08-06-2023	9
Pichilemu	09-06-2023	18
Pumanque	13-06-2023	21
Litueche	15-06-2023	14
Total of participants		131

Source: Own Elaboration.

Annex IV. Register of interviewees

N°	Name	Institution/Company	Mail address
1	Patricio Larrabe	CONAF*	patriciolarrabe@gmail.com
2	Jorge Castro	INIA Rayentué*	jcarrasc@inia.cl
3	Patricio Abarca	INIA Rayentué	patricio.abarca@inia.cl
4	Cristian Aguirre	INIA Rayentué	cristian.aguirre@inia.cl
5	Pamela García	Seremi of Agriculture*	pamela.garcia@minagri.gob.cl
6	Cinthia Arellano	Seremi of Environment*(in charge of Climate Change)	Carellano.6@mma.gob.cl
7	Ivan Mertens Galle	AGCID*	imertens@agci.gob.cl
8	Felipe Marambio	INDAP*	lmarambio@indap.cl
9	Rodrigo Valenzuela	Prodesal Pumanque*	rvalenzuelab@gmail.com
10	Oscar Bustamante	MINAGRI*	oscar.bustamante@minagri.gob.cl
11	Cecilia Araya Canales	MINAGRI	cecilia.araya@minagri.gob.cl
12	Claudia Farías Ogass	INDAP	cfarias@indap.cl
13	Teresa Nuñez	O'Higgins Regional Government	teresa.nunez@goreohiggins.cl

CONAF: National Forestry Corporation.

INIA Rayentué: Agricultural Research Institute.

Seremi of Agriculture: Ministerial Regional Secretaries are the representatives of MINAGRI in each of Chile's regions.

Seremi of Environment: Ministerial Regional Secretaries are the representatives of MMA in each of Chile's regions.

AGCID: Chilean International Cooperation Agency for Development.

INDAP: Agricultural Development Institute.

Prodesal Pumanque: Local Development Program Pumanque.

MINAGRI: Ministry of Agriculture.