Midterm Review

Review Final Report

Project "Enhancing the Adaptive Capacity and Increasing Resilience of Small-scale Agriculture Producers of the Northeast of Argentina"

COUNTRY: **ARGENTINA**
TYPE OF IMPLEMENTING ENTITY: **NATIONAL IMPLEMENTING ENTITY**
IMPLEMENTING ENTITY: **UNIT FOR RURAL CHANGE (UCAR)**
EXECUTING ENTITIES: **MINISTRY OF AGROINDUSTRY, NATIONAL INSTITUTE OF AGRICULTURAL TECHNOLOGY AND MINISTRY OF THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**
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Penélope Vaca Ávila. January 31, 2017.

ACRONYMS

ACG	Control and Management Area (UCAR)
AF	Adaptation Fund
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CIRN	Natural Resources Research Centre (INTA)
CNTE	National Coordination Office for Transfer and Extension (INTA)

CONICET	National Scientific and Technical Research Council
DCC	Climate Change Office of the Secretariat of Environment (now MAyDS)
FA	Argeninta Foundation
INDEC	National Institute of Statistics and Censuses
INTA	National Institute of Agricultural Technology
LFM	Logical Framework Matrix
MAyDS	National Ministry of Environment and Sustainable Development
MINAGRO	National Ministry of Agroindustry
NEA	Northeastern Argentina
NIE	National Implementing Entity
OECD	Organization for Economic Co-operation and Development in Europe
ORA	Agricultural Risk Office (Minagro)
RPTA	Regional Projects with Territorial Approach
PRODERNEA	Rural Development Project for the Northeastern Provinces
PROFEDER	INTA Program for extension projects
PROHUERTA	INTA Program for support of family farmers.
SAyDS	National Secretariat of Environment and Sustainable Development
ToR	Terms of Reference
UAS	Environmental and Social Unit (UCAR)
UBN	Unsatisfied Basic Needs
UCAR	Unit for Rural Change (Minagro)
UNFCC	United Nations Framework Convention on Climate Change

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1 PROJECT SUMMARY

The Adaptation Fund (AF)[1] was established by the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in its seventh Conference (Marrakech, Morocco, 2001) in order to fund projects and programs of climate change adaptation in countries that are parties to the Kyoto Protocol that are particularly vulnerable to its adverse effects. The AF is created in response to the demand of emerging countries in respect of their historical reduced responsibility for climate change generation and their high vulnerability to it. The AF funding was originated with the selling of Certified Emission Reduction (CER), within the Clean Development Mechanism (CDM), although afterwards government, private and individual contributions gained in importance.

The AF is the first fund that allows direct funding for member countries since they can accredit national institutions that take responsibility for the amount awarded to each country. The Unit for Rural Change (UCAR) of MINAGRO is currently one of the 24 Implementing Entities authorized by the AF worldwide[2]. Such status was acquired in March 2012 after an arduous accreditation process.

Within this framework, in April 2013, the project "Enhancing the Adaptive Capacity and Increasing Resilience of Small-scale Agriculture Producers of the Northeast of Argentina" (hereinafter the Project) has been approved, which is the first that UCAR is carrying out in its role as National Implementing Entity (NIE). The execution of the project started in October 2013, and although it should have ended in October 2016, it was extended until March 2018.

The Project **main objective** is to increase the adaptive capacity and resilience of small-scale familiar agricultural producers of NEA to climate change impacts and its variability, especially to those arising out of the rise in intensity of hydro-meteorological events such as floods and droughts.

Its **specific objectives** are the following:

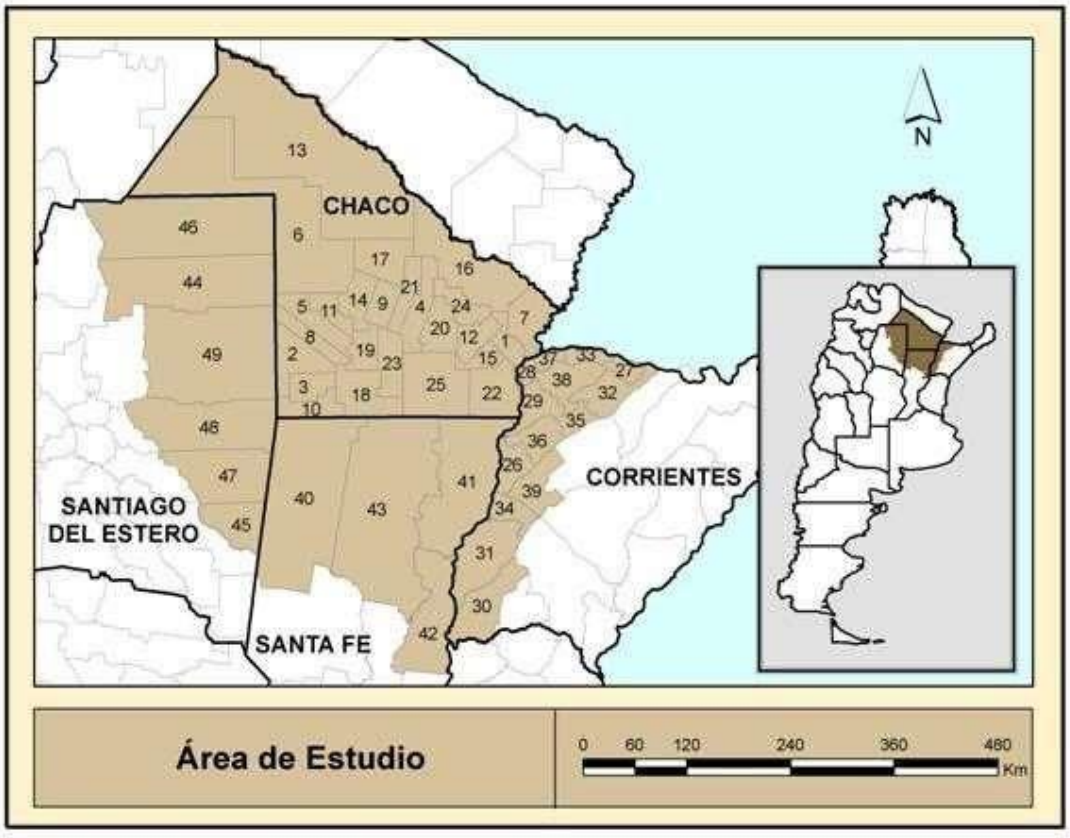
1. To **increase resilience of small-scale agricultural producers** of northeastern Argentina to climate change and its variability.
2. To **strengthen the hydro-meteorological and agricultural productive monitoring systems** to improve the institutional capacity of assessment of climate changes and their impacts on the agricultural subsistence systems.
3. To **increase the institutional capacity**, at national, provincial and local level, for the decision-making process and management of measures and actions of adaptation to climate change and its variability in northern Argentina.

[1] www.adaptation-fund.org
[2] https://www.adaptation-fund.org/apply-funding/implementing-entities/national-implementing-entity/

The Environmental and Social Unit (UAS) is the one in charge of the project in UCAR. The executing entities that are responsible for carrying out the proposed activities are the Agricultural Risk Office (ORA) of the Ministry of Agroindustry (MINAGRO), the National Institute of Agricultural Technology (INTA) and the Ministry of the Environment and Sustainable Development (MAyDS). The National Institute of Industrial Technology (INTI) acts as a technical assistance provider based on an agreement entered into with INTA.

The project area of execution includes the province of Chaco, northern Santa Fe, northeastern Santiago del Estero and western Corrientes. This area is seriously harmed by recurrent phenomena of climate variability such as droughts or floods.

Map 1. Project intervention area (provinces and departments)



Source: Project design document

2 REVIEW CONTENTS

2.1. Scope of the review

Halfway through the implementation period a Midterm Review has to be conducted, which provide information about the project evolution and the social and institutional learnings acquired from the practice (ToR). This review is therefore conducted according to UCAR intention of improving effectiveness, efficiency and relevance of the ongoing intervention with the AF funding. The conclusions and recommendations that arise from this exercise will allow counting on relevant evidence to improve the Project implementation as well as facilitate institutional learnings that contribute to improve the quality of its performance as NIE of the AF for future projects.

The review spans the period from October 2013 (beginning of activities under the UCAR-INTA agreement) to September 2016, when the review started.

According to the AF Board, a Midterm Review "will be critical of the initial outputs and outcomes of the project; this will also allow a review of the implementation quality of the program. It is essential that this review examine the hypotheses set forth during the preparation stage, particularly the agreed objectives and indicators, as well as the current context of the implementation. The analysis of the current context is especially important, since a change in the socioeconomic conditions can make the initial diagnosis (which was the starting point of the intervention) obsolete. The outcomes of this review can contribute to make certain modifications in the implementation of the intervention and the updating of the adopted assumptions" (AFB, 2015:6).

2.2. Objectives of the review

As established by the Terms of Reference (ToR) of this review, its objectives are the following:

- To analyze the **evolution of the Project** up to this date:

i) Factors that have contributed to the accomplishment and progress of the activities that facilitate the achievement of outcomes, and which have been the most successful implementation strategies.

ii) Obstacles and challenges in execution and implementation.

- To **identify and systematize social and institutional learnings, according to the following** points:

i) Collection of water and efficient use of water and land ii) Risk transfer for small-scale producers iii) Agro-hydro-meteorological information iv) Organization for execution: UCAR in its role as national implementing entity for the project, coordination, implemented administrative procedures, supervision, monitoring and internal articulation within UCAR and external with executing entities and actors involved.

- To analyze the **validity of the proposed design** and the **goals** in the light of execution.

- To propose **adjustments to improve implementation** and recommendations at the following levels:

i) Organization for execution: including improvements and adjustments in the circuits and processes to improve execution (including administrative procedures) ii) Relevance of actions and intervention strategy iii) Effectiveness of the project (achievement of outcomes) iv) Sustainability of actions".

2.3. Methodology of the review

The methodology of this review is framed within the international standards stipulated by the Development Assistance Committee of the OECD and recognized by the AF[3]. It is conducted under the AF guidelines for Final Evaluations of Programs and Projects, as long as these are applicable to a Midterm Review[4]. Finally, it follows the guidelines established in the ToR of the hiring and with all the details set forth in Reports 1 and 2 before this Report.

The exercise is structured according to an evaluation matrix[5] that proposes four criteria: relevance, effectiveness, efficiency and sustainability, whose emphases are detailed below[6]:

- The **relevance criterion** is focused on the analysis of the validity of the alternative chosen in the light of the current context, the internal coherence of the design (including the incorporation of the analysis of gender, youth and indigenous peoples) and studies the institutional dynamics in the formulation stage.

- The **effectiveness criterion** is concentrated on the analysis of the project evolution and progress achieved so far regarding the expected positive effects and studies the offered responses and the differentiate benefits obtained by each target group.

- The **efficiency criterion** is centered on the study of budget and temporal efficiency and the analysis of dynamics between implementation actors and execution.

- The **sustainability criterion** studies the unexpected effects and financial, institutional and technological sustainability of impacts.

[3] The DAC/OECD defines evaluation as "a systematic and objective assessment of an on-going or completed project or program, its design, implementation and results. The aim is to determine the relevance and fulfillment of objectives, development efficiency, effectiveness, impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision–making process. Evaluations are important sources of evidence of outcome achievement and institutional development, and must contribute to knowledge and organizational learning". OECD-DAC. 2010.

[4] Adaptation Fund, 2011 y Adaptation Fund Board, 2015.

[5] For further detail about the analytical reasoning of the Evaluation Matrix, see Report 1.

[6] For further detail about the analytical reasoning of each criterion, see Report 2.

3 SUMMARY OF THE MAIN FINDINGS

This section provides, in a synoptic manner, a summary of the main findings sorted by each of the four evaluation criteria above mentioned, in order for it to function as a roadmap for the reading of this document.

PROJECT RELEVANCE: HIGH

General: It broach climate change from an integrative, holistic and multi-institutional adequate perspective**,** focused on the perception of producers' needs (some of them not sufficiently visualized so far)

Climate trends in the Project Intervention Area. In past years (1986-2010), the Project intervention area showed a lower magnitude in the temperature rise compared with other regions of the country: the Central Region is the one with the lowest warming, although this is more pronounced in the northern zone, which is the project influence area. In the future, warming will rise moderately in line with national average, although again it will rise more in the northern region than in the south. In respect of rainfalls, they have not only increased in the past but also have particularly varied more. In comparison with other regions, its climate and rainfall projections outline a scenario of moderate flood risks and, to a wider extent, of increase in the number of drought days in winter (winter water stress). This effect is higher in the northern region and it is boosted by the change in the soil use caused by the expansion of the agricultural frontier.

Project relevance analysis related to magnitude of climate change. In the intervention area, climate change in the past and into the future occurs moderately and is lower if compared with other regions. However, it is one of the sites of the country with the highest number of days of intense rains (more than 95%) and with longer intervals between days with no days. This climate dynamic of flood and drought pulse, together with the increased duration of heat waves and the creation of a scenario aggravated by the change in soil use, represents serious climate risks for family farmers to whom a response is owed from an adaptation logic.

Vulnerability of family farmers to climate change in the Project intervention area.

The relevance of the intervention area (NEA region) is not only explained by the great variability of rainfalls and the increase in extreme situations (floods and droughts) with regard to other regions, but also because the northern Central Region houses those family farmers with most adaptation difficulties to climate change in the country. The recent but gradual deterioration of the country economic context makes the adaptation capacity even more difficult. In this way, considering the analysis that contrasts the designed intervention with the characteristics of the problem to be addressed and with the original and current context, the Project proves to be highly relevant.

Selected interventions and their contrast with the best scientific evidence on adaptation to climate change. The elected types of intervention (water access works, sustainable agricultural production systems, climate risk insurance policies, early warning climate information and soil

monitoring systems), which are then transformed into components and activities of the Project, are relevant to ensure resilience to climate change of small-scale agricultural producers in the area of intervention in the light of scientific evidence. Many actions focus on strengthening capabilities that improve sustainability. The project is also relevant in terms of its adaptation to the AF priorities.

Quality of the formulation process. The formulation exercise had an institutional bias that prioritized the participation in the project of the institutions and professionals that showed interest in the deployment of an adaptation intervention, that had institutional support and that had a recognized professionalism and experience in the matter. There is great relevance in the selection of the technical executing bodies (INTA/CNTE, INTA/CIRN, MINAGRO/ORA and MAyDS/DCC). Furthermore, this institutional bias has implied that the concrete interventions and activities that are proposed are effectively those that the different institutions and their specific areas were prepared to carry out, ensuring their future effectiveness and sustainability. The formulation methodology included participatory instances that allowed identifying the actions that best fit the needs of the target groups and generating channels for their active participation in the future development of the project.

Coherence in design and Logical Framework Matrix. The project design document is of great technical quality. The logical chain of outcomes reflects the underlying causal hypothesis. However, the implementation of the project would have been facilitated if the components had been matched with the natural areas of action of the three executing agencies (INTA/CNTE, INTA/CIRN and MINAGRO/ORA), and if some of the trainings of component 3 had been integrated as activities of components 1 and 2. In general, the indicators are specific, measurable, relevant and monitorable (SMART). However, the OG indicator should reflects impacts and not only the coverage of the intervention, in line with the definition of "resilience to climate change of small-scale family farmers". The way to measure progress at component level (OE) should also be clarified.

Gender and youth mainstreaming, and approach to indigenous peoples. Gender mainstreaming is formally slightly assumed in the project design, through the disaggregation of some indicators and the inclusion of the subject as a fundamental subject in trainings. However, although it is not specified, the project has great impact in this sense, since the drinking water access works (subcomponent 1.1., the one with the greatest budget allotment) ease the carrying activity that is mostly assumed by women and children, thus causing a huge potential in the improvement of their life quality and availability to carry out other functions. Youth relevance is tackled very specifically and without much depth in the project design, as well as the relevance of indigenous peoples.

PROJECT EFFECTIVENESS: MODERATE

Evolution of expected positive effects at global level. After three years from the start of the execution and a year and a half before its completion, the measured achievements according the GO (General Objective) indicator amount to 35% (# vulnerable families that have implemented adaptation measures as a direct consequence of the project actions), 1,391 families from an

expected total of 4,000. So far, 38% of the budget has been outlaid. Consequently, the global effectiveness can be estimated at 30-40% regarding the final goal, which implies a modest progress.

Evolution of expected positive effects of territorial intervention (subcomponents 1.1 y 1.3). It is led by INTA/CNTE and based on INTA's rural development proposal. It is implemented through the territorial network of the INTA Regional Offices (RPTA) Chaco/Formosa, Corrientes, Santa Fe and Tucumán/Santiago. It has a budget allotment of 41%. All activities of subcomponent 1.1 show a high degree of progress: the average measurement of their indicators reaches 71% of the final goals. The activities of subcomponent 1.3 are further behind, with an average effectiveness of 16% over the final target.

The project activities largely coincide with the previous lines of work of INTA Extension, and contribute to expand them into a kind of positive feedback, although sometimes they involve an additional workload. Water works, based on prototypes of INTI (which ensures technical assistance) or INTA, are deployed through a complex network of actors: the Project purchases materials and creates training instances, producers contributes workforce (funded by a training program of the Ministry of Labor), universities contribute the water analysis, municipalities fund various costs and provincial water agencies validate the activity. The work in output 1.3 is more delayed because target groups emphasized that they could neither work their farms nor improve their livestock if there was no sufficient water for the purpose previously. Currently, efforts are being made to balance the situation and for future planning, demands for subcomponent 1.3 have grown.

In May 2015, a land monitoring mechanism under charge of an external expert with the purpose of ensuring the completion of the processes and guaranteeing the achievement of impacts. The monitoring of territorial action has grown due to this boost, although there still exist deficiencies in the completion of some of the works.

Evolution of expected positive effects of intervention for risk transfer (subcomponent 1.2). It is led by MINAGRO/ORA, and it is based on the coordinated work with the Ministry of Production of the province of Corrientes, industry associations and insurance companies. It is aimed at generating and testing insurance policies for family agricultural producers against climate risks, and nonexistent product in the market. Two pilot exercises were planned; one for oleaginous plants and the other for horticulture, but only the second could be conducted. The policy was negotiated in a tripartite round-table (companies, provincial Ministry of Production and ORA/MINAGRO), and it was approved by the Superintendency of Insurance. The first of the two years of contract term is currently being completed. Next year the product will expand territorially and in quantity of covered products. The experience gained by all parties is fundamental to overcome the existing inertia to the permanence in traditional insurance products. It is important to document learning.

The action has a budget allotment of 23%. The implementation of the policy cover covers a smaller number of families than expected in the first year (74% of effectiveness), although it is an ongoing activity that will incorporate more beneficiaries next year. The activity related to the evaluation of the pilot exercise is pending until its completion, which will be of great importance in order to

ensure learned lessons of a product that needs to be consolidated between target groups and companies, as well as continuous support of the State for some years. The effectiveness average of the subcomponent is 35% of the goal at the completion of the action.

Evolution of expected positive effects of the intervention for the generation of an EWS-Early Warning System (component 2).

It is carried out jointly between INTA/CIRN and MINAGRO/ORA, in coordination with two provinces (Corrientes and Chaco) and industry associations. It seeks for an increase in the density of the meteorological stations network in NEA region, by building new ones, improving the existing ones and integrating some of certain provinces. This is aimed at strengthening the agro-productive and hydro-meteorological monitoring systems for a better decision-making process as well as creating a regional EWS. The first of the interventions is practically finished, and the second is currently in progress, with an already installed online EWS that requires extension and refinement.

The action has a budget allotment of 26% and an acceptable average fulfillment rate (50% of the final target). The goals of subcomponent 2.1. were achieved by 56% and those of 2.2. by 44%, the latter more delayed since its implementation depends largely on progress in the previous subcomponent, although a renewed boost is also required for the tasks of effective implementation of the agreements with the provinces.

Evolution of expected positive effects on capacity building (component 3). It was planned that MAyDS would lead the action but today it is led by a coordinator related to INTA. The setting of trainings as a separate component caused confusion since most of them are linked to activities from other components. Finally, some of the trainings were carried out from the coordination body of component 3 and others were developed by other actors. Nevertheless, according to their indicators, the activities show an outstanding degree of progress, except the trainings for producers. In subcomponent 3.1., trainings for technicians have proven 97% effective, and those for producers have an effectiveness of 17%, which represents a 57% average with respect to the final goal. Subcomponent 3.2. has fulfilled its objectives in respect of the number of institutions to be provided with training, it exceed the expected publications from 5 to 8 and it has held 60% of the planned meetings. On average, this component has proven effective regarding the planned final goal.

Differentiated benefits by target group, particularly women, young people and indigenous peoples. The Project target group range from families that practice subsistence agriculture to small-scale producers with commercial activity, depending on the subcomponent and the RPTA. When the work is done through social organizations (cooperatives, etc.), the execution has been improved, although this is occurs infrequently. The percentage of families reached by project actions that are formally led by women is low (10%), and those led by young people represent a moderate percentage (25%). However, the gender impact of subcomponent 1.1 is very high since the carrying of water is done by women and children, who spent an average of 4-5 hours a day. The women of the 721 benefited families that benefited from such subcomponent could release themselves from a work that takes them more than two months a year. In respect of indigenous peoples, Activity 1.3.1 shows little progress (5%), but in subcomponent 1.1., in some departments of Chaco and Corrientes, many actions are targeted at indigenous peoples, since they generally

suffer from a great degree of vulnerability and a very limited access to water. So far, 200 indigenous families benefit from component 1, i.e., 15% of the covered families so far.

PROJECT EFFICIENCY: MODERATE

Global efficiency and efficiency by component. The original approach that concentrates resources in the capitalization of the territory (works, information, trainings, etc.) with little indirect or institutional costs implies great efficiency in the use of resources. However, the execution rate of the activities has been moderate so far. In the three years of the project, a 38% of the funds granted was executed (2,090,549 USD) and the remaining 62% (3,549,452 USD) is going to be executed until March 2018. Two specific circumstances led to a delay in execution: the one-year delay in the signing of the agreement with MINAGRO/ORA, and the mistake committed by submitting UCAR budget of 2015 to the National Budget Office, where the Project funds were not assigned as a budget item of UCAR, thus becoming inaccessible. Components 1 and 3 are behind regarding their cost goals, with 62% and 81% of remaining funds respectively, while component 2 has achieved a satisfactory execution (54%). It is clear that there is need for significant acceleration in the execution rate of all of the components until the completion of the Project.

Efficiency by subcomponent. Subcomponents 1.1 of water access works and 2.1 of building, placement and integration of meteorological stations progressed firmly, with a cost of 67% and 87% respectively. The remaining subcomponents have not reached a moderate level of cost: 1.2. Insurances, 14%; Management, 19%; 2.2. EWS, 9%; Training for subcomponent 1, 30%; and for subcomponent 2, 4%. It is logical that 1.3 and 2.2 should be delayed since their execution depends on the completion of previous activities. A significant effort shall be expended in the remaining 17 months of execution.

Dynamics of actors of implementation and execution. The Project shows organizational complexities that represent a source of wealth and difficulty: a wide constellation of intra and extra-project technical actors; a new and ambiguous role of UCAR acting as NIE; shared administrative management (UCAR/FA); profusion, territorial dispersion and suppliers' small scale. This inter-actoral design is interesting and allows reaching goals that otherwise would be impossible to achieve, ensures mutual learning processes and the institutional embedding of activities. However, it makes intervention efficiency difficult, which creates the need for the existence of an actor that centralizes, keeps control of the objectives, maintains the rhythm and articulates participants. Furthermore, the Project does not have a typical centralized management unit: the executing entities are INTA, ORA and SAyDS. UAS/UCAR has originally deployed supervision competences in accordance with its role as NIE, but the need for overcoming the difficulties implied in such a complex project and with so many actors have resulted in UAS assuming the typical functions of an Executing Entity, since such functions were partially unperformed or they need to be reinforced. This situation has been undoubtedly positive for the achieved goals.

PROJECT SUSTAINABILITY/IMPACT: HIGH

Sustainability. The deployed methodologies (based on self-building and training for local producers and technicians) and the technologies used (adapted to the territorial socioeconomic reality, developed and transferred by public bodies and with great facilities for their replica) suggest a high sustainability for most of the work lines. The goals achieved in subcomponents 1.1., 1.3., 2.1, 3.1 y 3.2. are highly sustainable. The product of risk transfer can be sustained over time if an insurance market for small-scale agricultural producers is consolidated, which depends on the joint bet of the state (national or provincial), companies and producers. Finally, the creation of a regional EWS has progressed, but still there are challenges regarding data inter-operability and the introduction of the system to in-land producers.

Possible unexpected impacts and effects. Although there are existing references in the design document, LFM does not have an abstraction level aimed at identifying and measuring the project impact on the expanded environment or on public policies. The GO indicator does not measure impact but coverage, and progress of indicators of components and subcomponents is not available, i.e., indicators only provide the count of the conducted activities. This situation makes it difficult to estimate possible impacts. However, some positive unexpected effects can be preliminarily identified on the expanded environment of the project:

Although there are references in the design document, the LFM does not have a level of abstraction intended to identify and measure, through an indicator, the impact of the project in the expanded environment or in public policies. The GO indicator does not measure impact, but coverage, and the progress of indicators of components and subcomponents is not available. That is to say, only the count of the carrying out of the activities is available at the level of indicators. This situation makes it difficult to estimate potential impacts. However, some unexpected positive effects on the extended project environment can be preliminarily identified: improvement in women's quality of life and their availability for other productive, family or personal tasks; improvement in school attendance of children from beneficiary families; positioning of the issue of climate change and access to water in INTA and reinforcement of INTA as a territorial actor; and positioning of INTA and ORA as privileged actors for the interaction with UCAR in international climate change projects with territorial impact.

4 RECOMMENDATIONS

This section lists the main recommendations provided in accordance with the obtained findings, organized by component and subcomponent in order for them to be more easily comprehensible.

GENERAL

In Argentina, the agricultural sector is the most dynamic of the economy and the most relevant for the generation of foreign exchange. At the same time, it is the most sensitive sector to climate change. However, climate change is not currently incorporated as a problem to be addressed in the political agenda, at any level of public administration. If climate change in the agricultural sector as a whole is not identified as a problem and the search for solutions is not a priority, much less are their impacts on small-scale production. The accreditation of UCAR and the execution of two FA projects in Argentina have helped to make the profile of the issue progress internally in MINAGRO, in MAyDS and in agencies dedicated to disaster prevention. But one of the project impacts has to be aimed at increasing the profile of the issue at least in the technical agencies and for this purpose it must contribute arguments and experiences argued and systematized to boost this issue on the agenda.

RECOMMENDATIONS (on technical execution)

1.1. and 1.3. These two subcomponents have been presented in the course of the project as partially consecutive (producers who access the water are then able to implement improvements in their land to ensure a more resilient production). However, not all producers who have accessed to water works are in a position to inaugurate or sustain a small-scale production. On the other hand, some producers join the project directly with the land management of 1.3. This differentiation responds to circumstances of social vulnerability: families that could not carry out a minimum agricultural production, even with access to water, are likely to have the greatest structural deficiencies. It would be important to be able to register these two subgroups of recipients differently, for different reasons. Firstly, because in productive terms they represent very different profiles, which requires different support strategies. Secondly, because the families supported by the project generated a virtuous process of income growth (which can be measured by their involvement, first in subcomponent 1.1 and then in 1.3). Finally, at an exit strategy level, the producers committed to subcomponent 1.3 will be those that can join the Prohuerta program of INTA.

1.1. and 1.3. There is a great capacity for replication of the interaction proposed by INTA between extension and research in climate and water subjects on the part of other agencies such as MAyDS and at municipal level. Adaptation to climate change is necessarily multi-sectoral; it requires to generate a common language and to harmonize interests.

1.2. It would be fundamental to be able to evaluate and document the negotiation experience of the insurance policy, since both the process and the result are unique in the country. This would ensure their necessary dissemination at the institutional and political levels, favoring their replicability and sustainability. Experience is only the first step in the process of developing an insurance market for small-scale producers that is still incipient. State support for this process will be fundamental for a long time: until the market is mature and all parties (producers and companies) have adapted their structures and practices to the new agreement. The existence of this type of intervention depends, for now, on the permanence of such support.

1.2. Given that the development process of the products of risk transfer is still incipient, the key of sustainability of what was done in the project is the making of a rigorous evaluation of learnings and achievements obtained, and ensuring their expression through materials in different formats to guarantee dissemination.

2. It would be desirable that the Project could progress with the pending data transfer agreements with the provinces, by taking advantage of the resources and the opportunity that represents the existence of available funding. It will also be important to deepen the implementation of agreements already signed with provincial bodies and to make the most of INTA/ORA collaboration.

2. The regional EWS is one of the innovative products the project will generate. It would be desirable to make a progress in its refinement and appearance. The reduction in the level of uncertainty and the increase in the scale of the climate models for the NEA region would be a fundamental contribution of the project to climate change measurement at the international level and an important achievement to show before the Adaptation Fund.

2. Moreover, to anticipate the climate risk that characterize the region (where very unpredictable extreme events are recurrent) and to have more recommendations on how to act against them, since they have a high impact on their economic stability, including their survival, given that so far they do not have risk compensation. It would be important to make efforts to bring the developed tool to producers as well as to be able to record its level of acceptance or use in the field.

3. It would be essential to move forward with the trainings originally planned; both with the ones that can be carried out from the coordination of component 3 without articulating with other actors, as well as with those that must be carried out jointly. There is a lot of budget space and time for that purpose. Trainings reinforce the intervention sustainability and are particularly suitable for the last section of the intervention.

3. It is fundamental to undertake to give a decided boost for producers' trainings, which are at a very low level. Furthermore, it would be necessary to insist on trainings for decision makers from municipalities and even to work from the project in strategic planning to insert the climate change issue in their long-term plans. In this process, production risks with agrochemicals must be included as a problem to be considered in the context of family farming.

For all components. In the last year of the project, activities could be developed linking the three courses of action of the project, mainly at the territorial level:

- Once the regional EWS is available, actions should be devised to ensure its dissemination and use by producer communities. On the other hand, there are many local knowledge that the system could incorporate.
- The insurance initiative should be more closely linked to the activities carried out by INTA Extension and spread through its territorial links. The need for support to face emerging climatic risks is a continued demand of small-scale producers and this is systematically recorded by the technicians of extension.
- The ORA, in its initiative to think of revolving funds as an alternative to insurance for small-scale producers, should deepen its articulation with INTA Extension since, at the level of RPTA, cooperatives and groups of producers that already work with such funds have been identified, which have local experience and knowledge to carry them out.
- Climate change trainings at the municipal level should be emphasized. In this sense, to offer technical capacities to territorial policy makers and make them aware of climate change would ease the job of INTA Extension.

RECOMMENDATIONS (on management)

It would be advisable to add extra indicators to the GO that measure the effective reduction of recipients' vulnerability to climate change. These indicators must capture the different dimensions of the idea of resilience, aimed at the particular situation of family farmers. Some, therefore, may refer to increased income or its maintenance in the event of extreme weather events, although indicators can also be considered regarding the sustainability or improvement their quality of life and that of their families against climatic risks.

It would be necessary to identify which of the indicators listed in the LFM for the subcomponents can raise the abstraction level to measure progress in the components (several of the indicators of 1.3 would be relevant in this sense).

As far as it is possible, if this does not entail disproportionate costs, the measures already in place for the subcomponents should begin to be captured, as this may provide information regarding delays or over-executions that is relevant while the project is still in progress.

The UAS must consolidate its role of project executing entity and, for this purpose, the appropriate means must be provided by taking advantage of its budget margin. If necessary, as it was recently planned, the management functions of technical executors could be strengthened.

It is important to ensure a smoother administrative management over the remainder of the execution time. In doing so, duplicate functions or unnecessary functions targeted at stakeholders who have already internalized the required levels of quality should be identified. If the pace of implementation is to be increased, unnecessary intermediate procedures should be avoided and the instructions received by the actors in land should be anticipated as much as possible. On the other hand, they must understand that administrative management is necessary and cooperate with it to the greatest extent. The Planning Workshops can be used to facilitate this intermediation. The Exchange Day of October 14, 2016 was also a good initiative in this regard.

The pace of implementation should be accelerated over the remainder of the project: detailed planning measures with monthly targets per activity should be implemented, which should be monitored on a monthly basis at the meetings of the Execution Committee. Each actor must present his monthly progress, justify and correct deviations

5 PROJECT RELEVANCE

The project relevance suggests studying the alignment of the Project with its environment, by asking if the planned intervention is the most satisfactory solution to the identified problem and if this problem continues to occur five years after the formulation of the Project. For this purpose, the social and climatic changes that may have taken place are verified, and the extent to which they may have altered the fundamental purpose of the project is analyzed. In addition, the validity of the response to the problem involves contrasting the proposed solutions with the state of the art and the best scientific evidence available. Furthermore, it involves reviewing the project design and the internal coherence of its structure of objectives, results and activities, as well as the validity of its indicators and goals. In this regard, an ex-post quality analysis of the Project formulation phase, in general, and of the Logical Framework Matrix, in particular, is carried out. Finally, an analysis of the treatment given to some transversal subjects, such as gender, youth and indigenous peoples, is carried out.

5.1. Validity of the alternative chosen

5.1.1 Vulnerability to climate change in the project intervention area

This section covers the changes and continuities produced in the context in which the Project is developed and that may affect its current relevance. The formulation of the project worked with data from the 2nd National Communication on Climate Change (SMA, 2007) and other specific documents, which identified, at that time, an intervention for small-scale producers in the NEA region. In the time elapsed since the project was approved in April 2013, a new Communication – the 3rd CNCC (SAyDS, 2015) – was published, which, in general terms, continues to support the broad courses of action of the project and its geographical location.

Climate trends in the Project Intervention Area

Vulnerability to climate change depends not only on the intensity of climate change, but also on the different adaptation capacity of the populations that suffer it. The impacts observed in the territory depend, therefore, on an exogenous variable (climate change) and an endogenous variable (the adaptation capacity of the population and its productive structures). The ability to reduce such vulnerability is called resilience, which, for the purposes of this project, should be understood as "the ability of a social or ecological system to absorb an alteration without losing its basic structure or operation modes, its self-organization capacity, or their adaptation capacity to stress and change" (IPCC, 2007, p. 87).

The difficulties of family farmers in adapting to climate change represent the main problem that the project aims to address and this is evidenced by its General Objective (GO). In this sense, the GO of the Project is totally relevant to the identified problem, since it confines the problem of climate change to the particular type of risk daily suffered and perceived by family producers, which is the variability of hydro-meteorological events (mainly increase in duration of droughts, increase in frequency of floods and increase of heat waves).

The MAyDS has already established in the 2nd CNCC that this specific risk particularly affects the country. This communication declares that in Argentina "the inter-annual precipitation variability has a strong impact on agricultural production in periods of droughts and also when there are heavy rains that generate water surpluses and cause flooding in productive fields, damage to infrastructure, safety and health of urban populations" (SMA, 2007, p.93). The great importance of the climate change "variability" for small producers was highlighted in the interviews with all technical stakeholders of the project (UAS, INA and ORA) and field interviews. Technicians emphasized that the NEA region, although it is not the only region in Argentina that suffers from this problem, has one of the highest volatility indexes in the short and long term parameters of rainfall and temperature. The GO of the Project is therefore relevant since it aims to attack one of the main effects of climate change observed in the country, in the region where these are most evident.

The results of the 3rd CNCC verify the relevance of the intervention regarding the type of the risk selected and the territorial area chosen. However, the following clarification is necessary: for the 3rd CNCC, these provinces compose the **Central Region** of the **Chaco Seco Ecoregion**[6]. However, the analysis of climate data is conducted at the Central Region level (large-scale) and not at the Chaco Seco Ecoregion level (small scale)[7]. Each of the climate phenomena of this region are comparatively analyzed below, first by reference to historical trends and then to forward-looking projections.

In terms of **historical climate trends, the Central Region is the one that had the least warming** throughout the country in the period 1960-2010. The average annual temperature had an increase of only 0.2 ° C. However, this average reflects great geographical variation: in some northern areas, the increase was higher than 0.4 °C; while in the center of the region there were areas with some cooling. Regarding **rainfall**, there have been significant increases in annual precipitation over the same period, but there is great variation especially in the summer and autumn seasons.

[6] The Chaco Seco Ecoregion is characterized as semi-arid, although diminished in its easternmost part. Its park-specific vegetation is highly altered by the intense forestry exploitation, the extensive livestock breeding and, in many zones, by agriculture (SAyDS, 2015, p. 120).

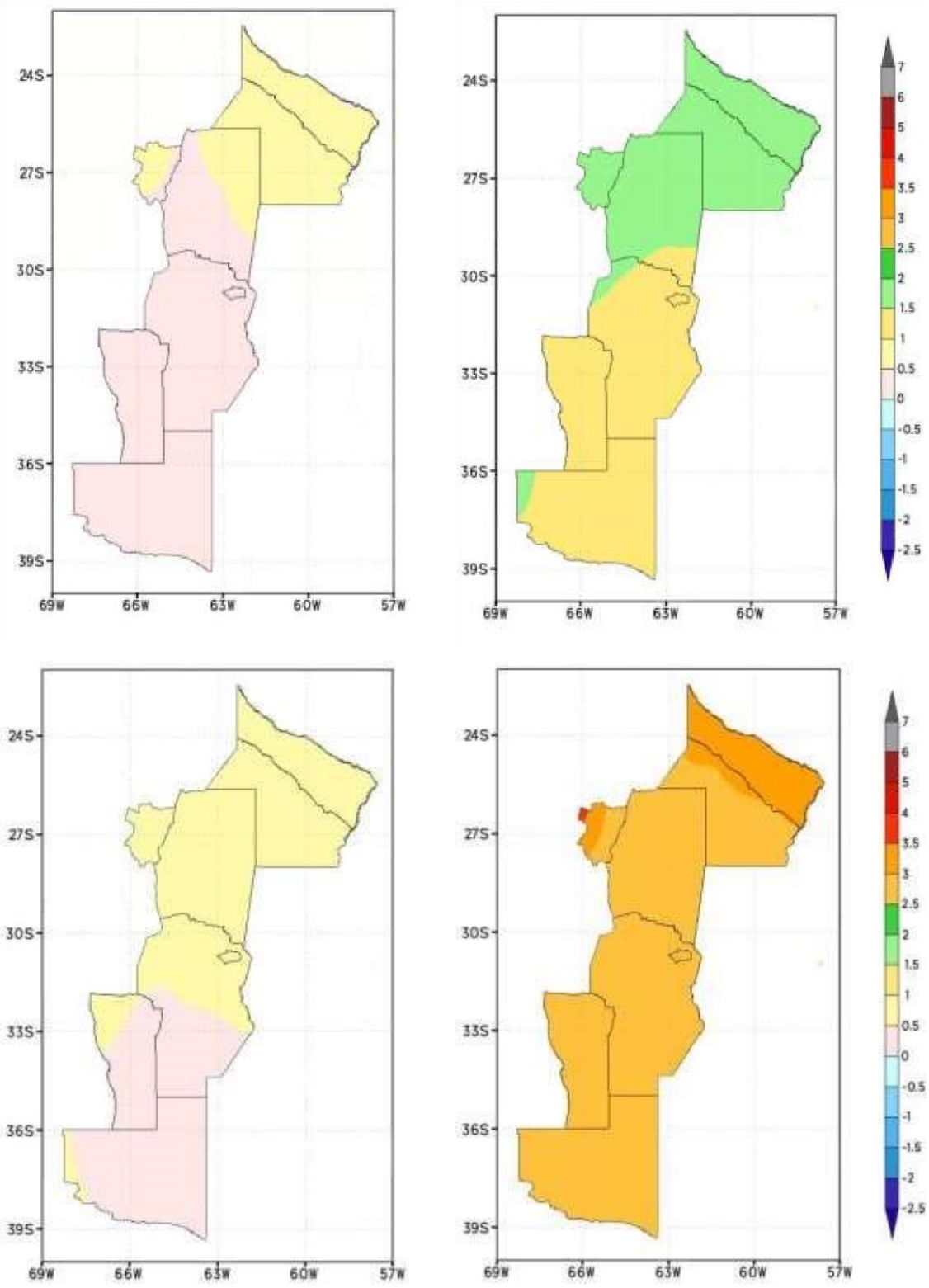
[7] The need for climate data at a useful scale for the decisión-making process has been identified by the technical actors of the project as one of the main obstacles to work on adaptation. This need arises because international climate projection models provide broad features: the large scale they work on makes it necessary to apply regionalization techniques to generate useful studies for territorial stakeholders. Increasing the scale of the models is called regionalization and refers to the process of increasing resolution to adapt the large-scale projections generated by global climate models to regional or local characteristics. These regional models are much more influenced by orography, land-water contrast and the particular use of the soil. The 3rd CNCC works with climate data by region (in our case, the so-called Central Region) and does not perform differentiated analyzes for the Chaco Seco Ecoregion. It covers a greater number of provinces than those linked to the project intervention area, and therefore, for our analysis, only the references made in the document to the north of the Central Region are relevant.

Indicators of **extreme rainfall** in areas of potential floods changed moderately in a manner consistent with higher rainfall. The maximum of consecutive days without precipitation of each year has also increased, which in this region of marked dry winter season, is an indicator of its extension. This change is aggravating the seasonal water availability for some populations, and creating more favorable conditions for forest and pasture fires, as well as greater stress conditions on agricultural activities (SAyDS, 2015, p 121)[8]. Therefore, **winter water stress** has been the most worrying consequence of climate change in the north of the Central Region, as well as flooding for the eastern end.

Looking ahead, **climate projections for the entire country** estimate that the average temperature would rise during this century, although "the projected temperature increase is greater in the north than in the south, with a maximum in the northwest" (SAyDS, 2015, p.107). Likewise, "projections indicate, on average, an increase in extremes of high temperatures and extreme precipitation in most country regions" (SAyDS, 2015, p.107). **Future forecasts for the Central Region** follow the national pattern of temperature rise above mentioned, but the warming would be higher in the northern area than in the central and southern areas (see map below). In the near future, the number of days with heat waves would increase moderately in the south and somewhat in the north. In the distant future, the increase in days with heat waves would be greater in both scenarios and higher in the north than in the south.

[8] The 2nd CNCC pronounced itself in the same sense, where it was already noticed that in the northern regions of the country rainfall is very scarce in winter, reason why the greater potential evaporation could intensify the winter droughts, increasing water stress on the crops and pastures and the risks of forest and pasture fires. (SMA, 2007, p. 102).

Map 2. Central Region (Formosa, Chaco, Santiago del Estero, Tucumán, Córdoba, San Luis and La Pampa). Change in average annual temperature regarding the 1986-2005 period. Upper panel scenario RCP4.5 and lower 8.5. Left, near future, right, distant future



Source: 3rd CNCC (SAyDS, 2015, p. 122)

Regarding **rainfall projections,** it may be supposed that there would not be major changes in annual average rainfall except for a slight change in the maximum annual number of consecutive dry days (maximum dry time) (SAyDS, 2015, p. 122). This way, according to the 3rd CNCC, the particular dynamic of the northern area of the Central Region, area of influence of the project, is prone to alternate intervals of floods and droughts, as specified in the Project Document itself (page 3), and also to a moderate increase of heat waves.

The above-mentioned climatic situation (the moderate increase in warming, together with the increase in annual average precipitation, especially in the summer period) has generated in the Central Region more humid conditions that favored the **expansion of the agricultural frontier** towards the west (along with the rise in international prices and new technologies). This advance of agriculture has occurred at the expense of livestock, but also through a significant deforestation of native forests and mountains. This is causing major environmental changes in carbon and nutrient storage, in the water cycle, in surface runoff, in habitat availability, in soil salinity, in acidification of watercourses, and in the expansion of floods associated with groundwater dynamics (SAyDS, 2015, p 124). These factors further increase vulnerability to climate variability and climate change in the Central Region.

Therefore, the moderate increase in temperatures, the expansion of heat waves and the pronounced rainfall variability, all magnified by the change in soil use, generate a great challenge to face for the northern part of the Central Region. In response, "sustainable production systems capable of maintaining or increasing agricultural production while preserving environmental qualities" (SAyDS, 2015, p.125) should be strengthened.

Climate Trends in the Project Intervention Area

In the past (1986-2010), the Project intervention area showed a smaller magnitude of temperature increase than other regions of the country: the Central Region is the one with the lowest warming, although this is more pronounced in its northern zone, area of influence of the project. In the future, warming will increase moderately in line with the national average, but again more in the north of the region than in the south. Regarding rainfall, it in the past there was an increase not only in rainfall itself but also in its variability. Compared with other regions, their climatic and rainfall projections create a scenario of moderate flood and, largely, of an increase in the number of drought days in winter (winter water stress). This effect is greater in the north of the region and is boosted by the change in soil use generated by the expansion of the agricultural frontier.

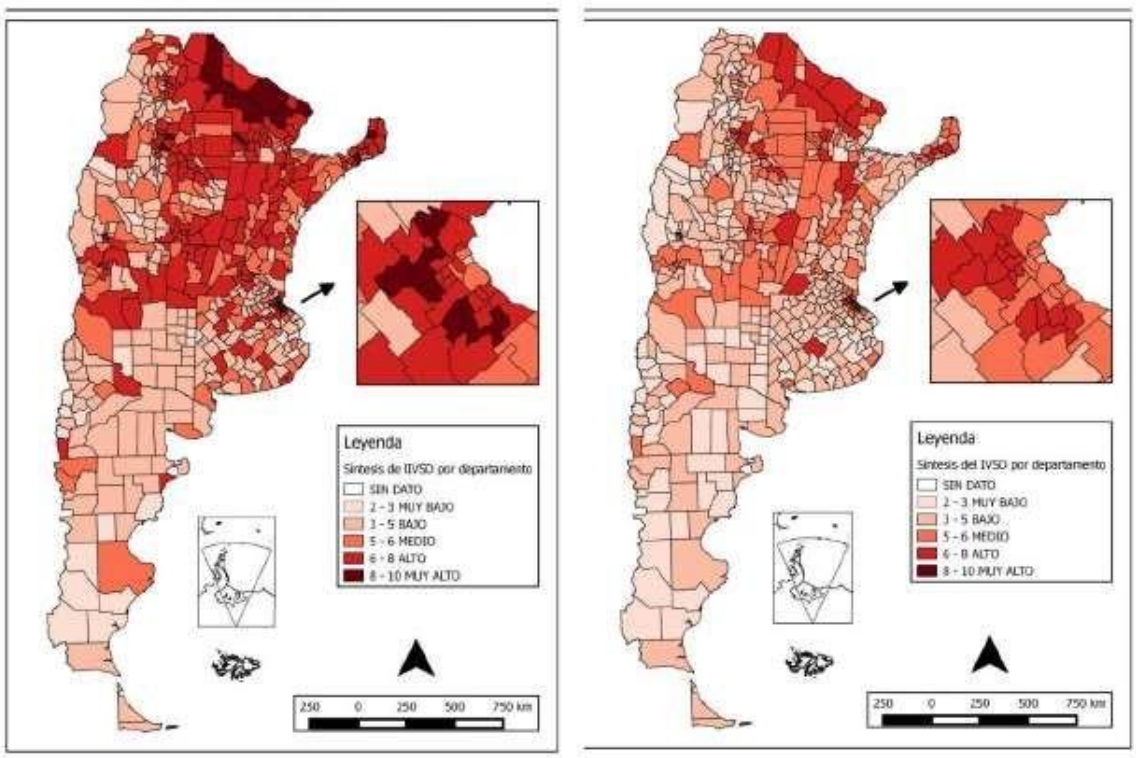
Project Relevance Analysis regarding the magnitude of climate change

In the intervention area, climate change in the past and in the future is presented moderate and comparatively lower than in other regions. However, it is one of the places in the country where the number of days with heavy rains increases (above 95%) and where the days without rains are more spaced out. This climate dynamics of pulses of flood and drought, coupled with the longer duration of heat waves and the configuration of a scenario that is aggravated by the change in soil use, represents important climatic risks for family agriculture to be addressed from an adaptation logic.

Social vulnerability of family farmers in the Project Intervention Area

The level of social vulnerability is key in shaping the risk of climate variability. For this purpose, it is necessary to analyze the different degrees of vulnerability of the affected social group by evaluating the material and non-material resources that it has in order to face the emerging challenges. The complexity of the factors that determine vulnerability can be summed up with a qualitative index based on several indicators. The **index of social vulnerability to disasters (SVID)** [9] is structured on the basis of three dimensions of vulnerability: social conditions per se, housing conditions and economic conditions (SAyDS, 2015, p.37).

Map 3. Social vulnerability index for disaster management (SVID), with data from censuses. 2001 (left) and 2010 (right)



Source: 3rd CNCC (SAyDS, 2015, p. 38)

The maps above summarize the evolution of the different aspects of the SVID throughout the first decade of this century. The first assessment that emerges from the observation of these is a greater relative vulnerability in the Project Intervention Area, persistent over the years.

The second appreciation is that there is a significant improvement of these conditions throughout the national territory over the decade. One of the most important contributions to the reduction of vulnerability to disaster risk in the last decade has been the improvement in the socioeconomic

[9] The SVID has been developed by Silvia G. González, based on S. G. González, A. Calvo y C. E. Natenzon. Proyecto UBACYT - PDTS-PF01, 2013-2015.

conditions of the poorest rural sectors (SAyDS, 2015). This improvement has contributed to reduce the adverse impacts of extreme climate events, as established in the specialized literature (IPCC, 2014).

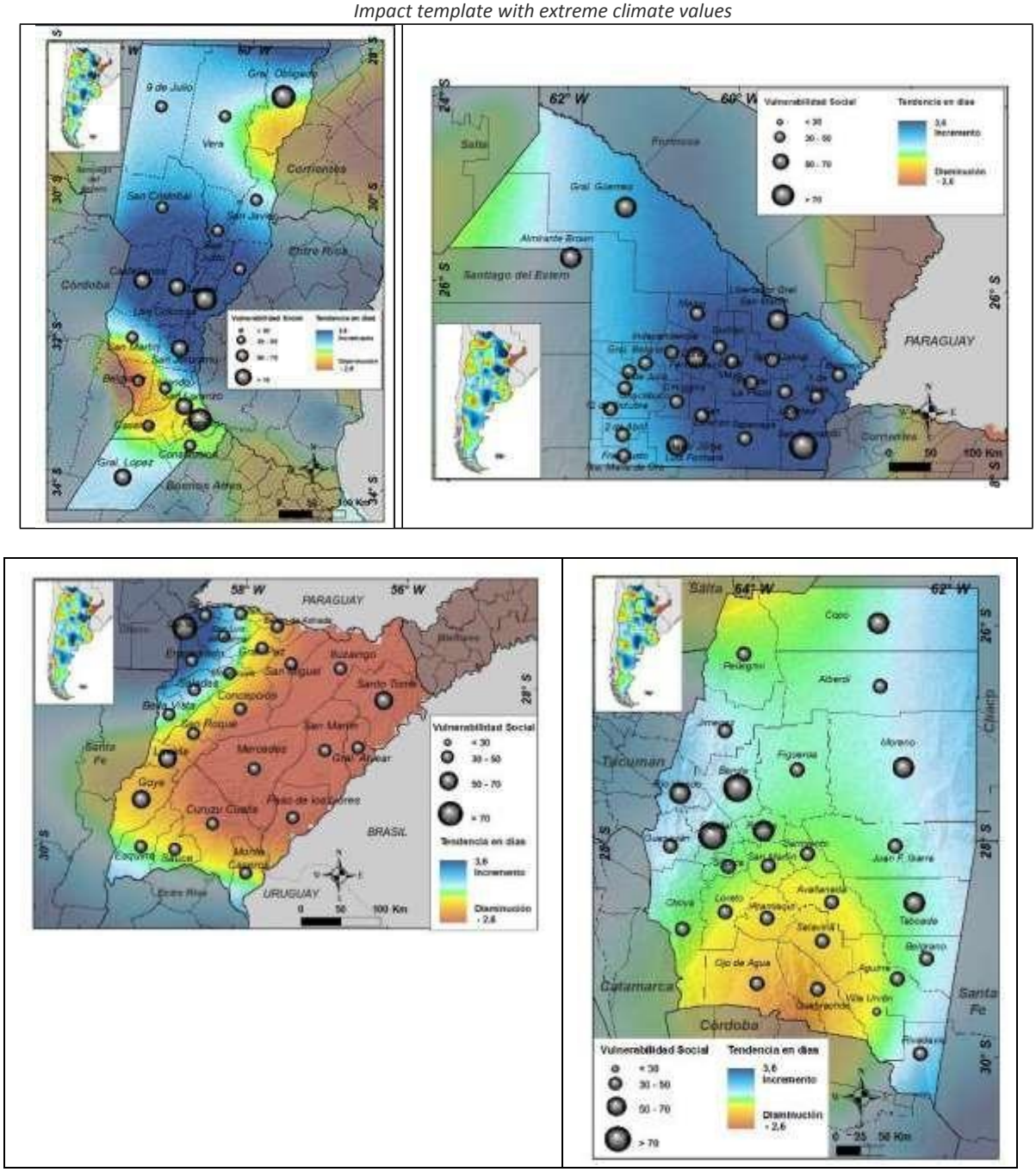
The reversal of this trend and the increasing worsening of living conditions of small-scale agricultural producers as a result of the economic recession suffered by the country since the slowdown in economic growth in 2012 and, above all, the negative growth observed in 2016 (-0.509% over the previous year according to the World Bank), provide an additional factor for the Project relevance.

If we analyze the social situation from the index of unsatisfied basic needs (UBN) of the households located in the rural departments of the project geographic area, taken from census data of 2001 (INDEC), we observe that they fluctuate between 26,4% and 47.56% (see Project Document page 10 et seq.). These percentages are much higher than the national average, which stands at 17.7%.

In conclusion, the NEA population presents a set of social vulnerability indicators more critical than the national average, which generates greater vulnerability to the consequences of climate change. This situation makes the region a relevant scenario to develop the intervention.

In the following maps, the measurement of social indicators (UBN) is combined with the trends observed during the last 50 years of extreme climatic values (frost days, warm nights, rainfall above 95% and consecutive days without rain) in the project intervention area. This provides useful information for the analysis of climatic risk by district and province.

Map 4. Social vulnerability (Unsatisfied Basic Needs) in the Project area (Santa Fe, Chaco, Corrientes y Santiago del Estero) vs. Impact template with extreme climate values



Source: Project design document, taken from INTA & DCC SAyDS (2012).

Furthermore, the smaller the scale of the producer, the greater their difficulty in dealing with climatic challenges or other challenges. In the departments chosen to deploy the intervention, a high percentage of the producers of the small-scale family farming (see project document) are identified, which implies a high concentration of recipients with high vulnerability. According to

the National Agricultural and Livestock Census of 2002, which continues to be the last with statistical value, the proportion of family farming over the total number of farms for the NEA region is 92%, while at the country level the average is 75.5% (Scheinkerman de Obschatko, 2009).[10]

Vulnerability to climate change of family farmers in the Project Intervention Area

The relevance of the intervention area (NEA region) is explained not only by the great relative variability of rainfall and by the rise in extreme situations (floods and droughts) with respect to other regions, but also by the greater relative difficulty of adaptation of its producers with respect to producers in other regions of the country. The relevance of the intervention area is therefore justified both by the importance of the exogenous variable and by the incidence of the endogenous one: the north of the Central Region is home to those family farmers with the greatest difficulty in adapting to the country's climate change. Likewise, the concentration of the Project in the risks that are "derived from the increase in intensity of hydro-meteorological events like floods and droughts" (GO) is very pertinent since these are the climatic risks identified as the most relevant for producers of this region. Finally, the project increases its relevance due to the deterioration of the economic context of the country, particularly in recent years, which results in a decreasing adaptability of producers. Therefore, in the analysis that contrasts the intervention designed with the characteristics of the problem to be addressed and with the original and current environment, the Project is very pertinent.

5.1.2 Validity of the proposals compared with the best scientific evidence

The 3rd CNCC (SAyDS, 2015, p. 148 y ss.) identifies the most relevant interventions to deal with climate change:

- Climate forecasts From Early Warning Systems (EWS)[11];
- Soil, vegetation and water status monitoring[12];

[10] The definition of "family farm" used in the Scheinkerman study and in the project document establishes that it is the one in which the direct work of the producer and the existence of family labor is verified, although it also includes farms that, regarding these two characteristics hire up to two permanent paid workers. The interregional comparison is as follows: "Family Farms are a clear majority in the regions of Northwest and Northeast Argentina (between 78% and 92% of the total Family Farms respectively) and represent between 60% and 69% in the regions Cuyo, Pampeana and Patagonia. As for the importance of the surface, it reaches a maximum of 59% of the total surface area in the Puna, while in other regions it goes from 8.3% in the Oasis Cuyanos to 32% in the Chaco Seco" (Scheinkerman de Obschatko, 2009, p. 10).

[11] "As long as many of the defense works are not built and even after that, strengthening and adapting early warning systems to adjust them to new conditions is a priority need in climate change adaptation actions. For this purpose, it would be necessary to have much more equipment than the present one in automatic hydrological and meteorological stations and in meteorological radars, and to complement them with hydrological models that allow to anticipate the displacement of the surplus water, according to the meteorological forecasts, or at least to address the surplus water just when it is originated by the intense rains"(SAyDS, 2015, p. 150).

- Insurance policies linked to climate changes[13];
- Sustainable production systems[14];
- Defense works.

All of them, except for the last one that refers to Works aimed at preventing floods, are developed by the Project (EWS and soil monitoring in Component 2, insurance policies linked to climate changes in Component 1.2. and sustainable production systems in Component 1.3.). Moreover, works for access to drinking water are carried out in drought-affected areas (component 1.1.).

The concentration of the activities in works for access to drinking water and not in works against flood is justified for different reasons. Firstly, drought is a more prevalent event than flooding in the project intervention area, although there are different priorities according to the different intervention subzones. In the Impenetrable Chaqueño, the north of Santa Fe and the east of Santiago del Estero drought is the main problem and there is rarely any flood. In Corrientes, flood is a major problem as well as the excessive rainfall in some areas of Chaco. Another reason is that works against floods are of a much greater magnitude than the one that it is appropriate to face through a project against climate change of this scale, because of budgetary limitations. Finally, it would go beyond the scope of intervention of the institutions convened for this project, entering the natural scope of action of the Ministry of Planning or the National Water Institute, which work with modeling and forecasting. It seems pertinent, therefore, to focus on works for access to drinking water and management of climatic excesses at farm level in a project of these characteristics.

This option, however, was faced with a major challenge. Along the Paraná River (Santa Fe and Corrientes, to Resistencia) there is good quality water and therefore the type of drilling work is appropriate. The water found in these areas is suitable for human and animal consumption. However, many areas of Santiago Estero, Chaco and west de Santa Fe have groundwater with high salt or arsenic content, which makes it unfit for human or animal consumption. Consequently, it was planned to carry out rainwater collection works in these areas[15]. But this typology faces the fact that many farms of small-scale producers are located in the limits of large fields of extensive production that use aerial spraying of their crops with highly toxic products (glyphosates and others). In order to address this complex situation, which exceeds the intervention capacity of the project, a CONICET researcher is collaborating to filter water and eliminate glyphosate. Likewise, in the workshops with territory technicians, the discussion on the subject is promoted to identify

[12] "The evolution of the soil water status, taking into account climatic and soil variables, is another supporting tool for the decision-making process, especially for those decision related to the suitability of applying supplemental irrigation" (SAyDS, 2015, p. 150).

[13] "Insurance policies linked to climatic indexes (rain, temperature and hail) have begun to develop in Argentina and appear as a promising option for the transfer of climate risk" (SAyDS, 2015, p. 150).

[14] "Certain management practices such as crop rotations, crop-livestock rotations, the use of cover crops and conservation tillage, among others, allow to conserve productive and environmental resources, sustain or increase productivity levels and reduce vulnerability to climate and climate change. Several of these practices favor water retention by soils and reduce the impact of droughts". (SAyDS, 2015, p. 151)

[15] There are technologies that would allow filtering water with arsenic, but their cost makes them unsustainable interventions for the type of producer identified as beneficiary of the project.

ways of solving it in each particular case, information on the effects of agrochemicals is promoted to the producers and alternatives to articulate with other institutions are discussed.

Except for this particular case, **all intervention typologies incorporated to the project design are highly relevant according to the specialized literature**. Discarded or unincorporated options (flood works or advanced technologies for filtering water suitable for consumption) are justified by the size of the project or for reasons of technological sustainability, as detailed in the appropriate section.

Furthermore, the project is **relevant also with respect to the priorities established by the Adaptation Fund**, which stresses the reduction of the vulnerability of recipients and the development of concrete measures as objectives of their Agriculture area[16].

Selected interventions regarding scientific evidence on adaptation measures to climate change

The types of intervention chosen (water access works, sustainable agricultural production systems, climate risk insurance policies, early warning and soil monitoring information systems), which are then transformed into components and activities of the Project, are relevant to ensure resilience to climate change of small-scale agricultural producers in the intervention area in the light of scientific evidence. The project is also relevant in terms of its adequacy to the AF priorities.

5.2 Institutional dynamics in the formulation stage

The formulation process of the Project has been surrounded by the granting of the National Implementing Entity status for the AF to UCAR. The achievement of NIE status has been a major milestone for UCAR since it is the only Argentinean entity to achieve this status so far. This initiative was carried out with the support of the National Secretariat of Environment and Sustainable Development (SAyDS), which also played a major role in the formulation process leadership.

The formulation exercise was institutionally biased: the SAyDS and the UCAR convened those institutions which, according to their own judgment, best suited the AF priorities and could take part in a project for adaptation to climate change that could apply measures both on territory and at a national level. After the lack of interest of some of the convened entities, a formulation team in charge of articulating the current implementing entities was set up.

Although according to the interviews conducted, the convergence of the entities that finally committed to the formulation and implementation of the Project was driven by the fact that the subject is a priority in their institutional activity and by the interest shown by those professionals that run their corresponding areas of work, in the end, the selection of such entities has been more than proper. According to the 3rd CNCC (SAyDS, 2015, p. 149 and SS.) the technical actors of the Project are among those who are most recognized in each of their subjects of intervention: the

[16] See https://www.adaptation-fund.org/projects-programmes/project-sectors/agriculture/

Agricultural Risk Office from the National Ministry of Agroindustry (MINAGRO/ORA) and the National Resources Research Centre from the National Institute of Agricultural Technology (CIRN/INTA) for the early warning and soil monitoring systems, the first one being focused on the development of products of climate risk transfer (insurance policies)[17]. Additionally, the focus on Territorial Development approach, that has been sustaining the field work of the National Resources Research Centre from INTA (CIRN/INTA) for a decade, has been specifically adjusted to the need of reaching out to isolated and low resources producers in a vast territory and it has made it easier, up to a great extent, to identify the kind of intervention and technology which best suited the context[18]. Therefore, there is great relevance in the selection of the executing entities and that translates into a Project design of great technical quality.

The institutional bias of the formulating process entailed that the different interventions proposed are actually those that the different institutions and their specific areas are able to carry out. This implicates the circumscription of the different alternatives that are materially possible to be carried out. This cut back greatly ensures the feasibility of the outcome and the quality of the expertise at stake in the Project (each actor does what it best knows how to do). However, in the end, the selection of the actual interventions is relevant and appropriate.

Finally, the formulation process had a participatory approach: during the design, a series of consultation activities have been conducted among key stakeholders in the area (small-scale family producers grouped together in farming associations, local authorities from the different municipalities in each department, indigenous communities' leaders, rural women groups, etc.). This process not only helped to identify those actions which best suited the needs of each of the identified groups, but also to develop channels and to define the methods for an active participation of each of the groups in the development of the project.

Analysis of relevance of the Project according to the quality of the formulation process.

The formulation process was institutionally biased prioritizing the involvement in the project of the entities and professionals who showed interest in the development of an adaptation intervention, which could count on institutional support and had reputable professionalism and expertise in the subject. There is great relevance applied to the selection of the technical executing entities (INTA/CNTE, INTA/CIRN, MINAGRO/ORA and MAyDS/DCC). The institutional bias entailed that the different entities and their correspondent areas are actually able to carry out those specific measures that had been proposed, ensuring their future effectiveness and sustainability. The formulating method included participating instances, which allowed to identify those actions which best suited the needs of the target groups and to create channels for an active participation of these groups in the future development of the project.

[17] It has been recognized by the formulators that meteorological services will be included from the beginning in future projects of adaptation, as they are connected with the World Meteorological Organization and are familiar with the international standards of data certification.

[18] For more information on the approach towards territorial development of INTA Extension, please visit: inta.gob.ar/documentos/enfoque-de-desarrollo-territorial

5.3 INTERNAL COHERENCE IN DESIGN

In this section, we provide for an ex post analysis of the formulation quality of the project in general and from the Logical Framework Matrix, in particular[19]. For that purpose, we conduct a review of the design document of the Project and the internal coherence of its objectives structure, outcomes and activities, as well as the effectiveness of its indicators and goals.

A coherent Logical Framework Matrix is one that reflects the underlying "causative hypothesis" and that conveys it into a chain of results, where each group of proposals of an inferior level is required and sufficient to achieve the next level. In other words, a coherent LFM guarantees that the transformation process of inputs leads to the success of the different activities, that its implementation assures the achievements of subcomponents/outputs, and, at the same time, that its quantity, quality, opportunity, and relevance establish the achievement of specific objectives/components/outcomes, and therefore, the general objective.

In this case, the Logical Framework Matrix is coherent in general and provides a good quality in identifying the chain of objectives and the technical quality of the indicators. However, some basic errors can be pointed out: 1) the nomenclature used is confusing; 2) the division by component had no practical effect towards the organization of the implementation; 3) the design logic behind each of the three components are slightly different from one another; and 4) some of the indicators are out of place and should be placed in a higher level of abstraction.

Firstly, as shown in the illustration in below, the nomenclature used in the LFM is profuse and confusing in some cases: some references have more than one name and at the output level (second level of analysis), the division between output and outcome is not clear enough, moreover when only one of them has associated indicators. Furthermore, the outputs are conventionally those accomplishments derived from the activities and are related to the first level of abstraction, not to the second. In order to avoid this confusion, in this report, the references to the second level of analysis (1.1, 1.2, etc. are shown in grey in the illustration) will be referred to as "subcomponents".

Secondly, the interviews suggested that the structure of the components has been sought from the climate change theory, which is reasonable, as the UAS has historically been a technical unit in this subject. That is to say, the three components of the program reflect different theoretical approaches towards adaptation to climate change.

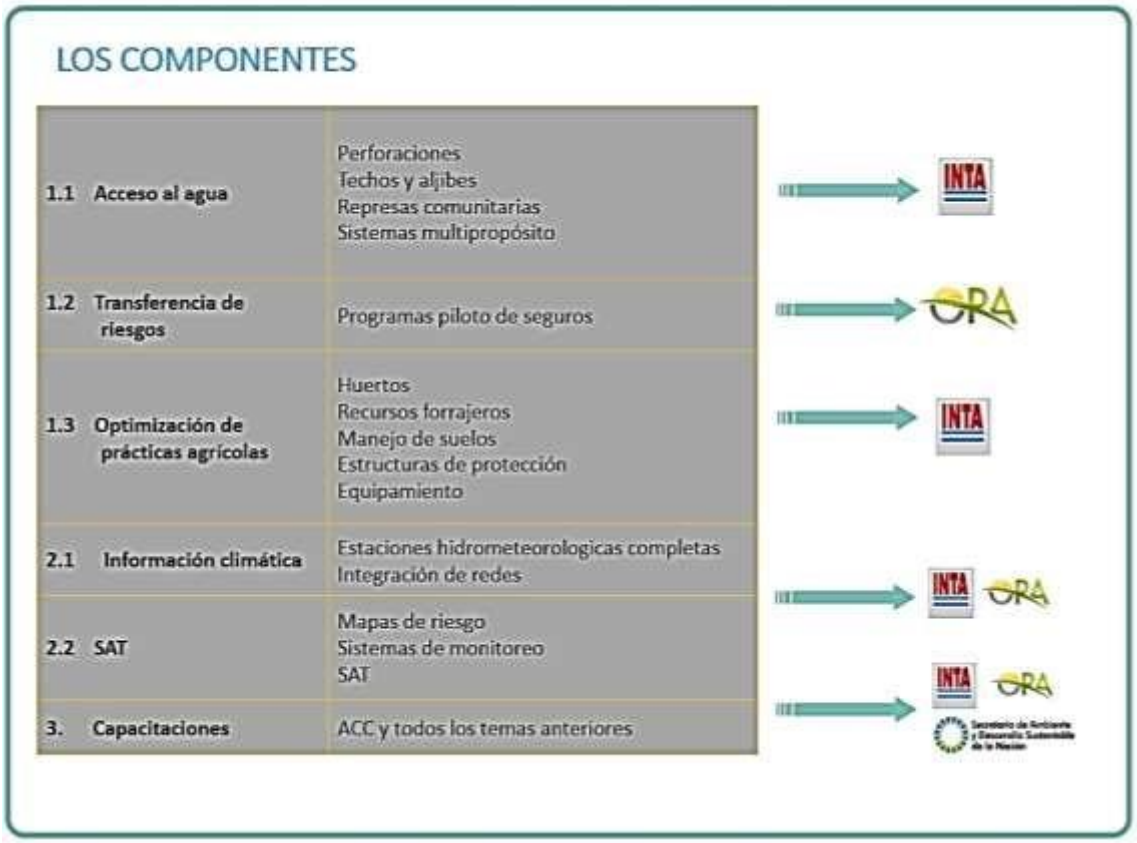
Illustration 1. Nomenclature of the LFM results chain used in the Project design document

[19] The Project proposal document contains several cuts of the LFM in several points of the text (page 36 et seq. and page 132 et seq.). There is a consolidated version in Annex I.

Note: Those levels of the chain of objectives containing indicators are in bold.

This way, originally, the LFM proposes a component 1 of direct intervention and an approach to vulnerability at territorial level, a component 2 of prevention for increasing the adaptive capacity thus improving the climatic information available and a component 3 also concerning the increase in the adaptive capacity but linked to a specific type of intervention: training. This type of structure leads to several instances of inter-institutional coordination at a subcomponent level. Not so much for component 1, but for component 2 and mostly for component 3. It also causes that the division by components does not match in all cases with the institutional areas of competence from the executing entities

Illustration 2. Task distribution among actors by subcomponent



Source: UAS

However, theories about public administration, and politics and programs implementation suggest that the structure of an intervention should be designed aiming at the stage of execution. Several authors suggest that the relationship between the actors and the entities involved should be taken into account, already from the design stage, in order to guarantee their coordination and communication (Harguindéguy, 2013, p. 89). Inter-agency coordination is, on a general basis, difficult to achieve, not because of a lack of interest, but due to the inertia and usual discrepancies present in public administration. Therefore, **it is advisable to come up with a program set up for the actors who will execute it in order to make the components meet with the natural environments for each of the technical executing entities, trying not to overcomplicate the linkage nor increasing the coordination instances.**

The separation of training in Component 3 partially interrupts the logical sequence of the LFM and has produce negative results in the execution. Probably, subcomponent 1.2 should have had a higher emphasis. Nevertheless, at the core of components 1 and 2 (except for what has just been pointed out) the LFM is adequate and coherent[20]. To a lesser degree, the LFM of Component 3, since it contains loopholes and is not developed with enough detail (product 3.2 does not have

[20] There is a minor mistake in the denomination of the actual OE1/Component 1 ("Increasing resilience of small-scale agricultural producers in the northwest towards climate change and its variability"), as it coincides with the GO. This denomination should refer to the specific content of that component and be related to the idea of an intervention at a territorial level. Nevertheless, this matter had no relevance towards implementation: it is but a formality.

indicators, baseline or target and the ones from activity 3.1 are far too general: all of them have the same indicators, baseline and target).

Regarding the LFM indicators, the proposed indicator for the GO gathers all of the project actions, but not its impact. The concept of resilience to climate change is a complex one[21] and its indicator should be able to gather all of its scope. For that to occur, it should be complemented by additional indicators that measure the effective reduction of vulnerability to climate change of the small-scale producers addressed (an income indicator or a family quality of life indicator or a capacity indicator to tackle external events successfully). One possibility would be to add the first indicator from subcomponent 1.1 to the GO level ("% of producers who improve their capacity of response and action when faced with climatic variables"), even though, for its measurement, an index will probably need to be made. Moreover, concerning the existing indicator, it would be necessary for the project management to explain the calculation to meet the desired target (4,000 families), as in view of the project budget and in comparison with the achievements by other similar UCAR projects, this target could possibly be overestimated.

Table 1. General objective, indicator, baseline and goal

General Objective	Indicator	Base line	Target
Increasing the adaptive capacity and developing resilience of de small-scale agricultural family producers towards impacts of climate change and climate variability, particularly those effects arising from an increase in the intensity of hydro-meteorological events, such as floods and droughts.	Number of families vulnerable to the negative effects of climate variability and climate change.	Number of families vulnerable to the negative effects of climate variability and climate change.	At the end of the project, at least 4000 of the most vulnerable families in the project area will be beneficiated by the activities proposed to tackle climate change and climate variability.

Some of the indicators proposed for the subcomponents/outputs, are products indicators and therefore they could be used for measuring the progress of the components, since in the matrix design it is not clearly specified how to do so at this level.

In addition, the subcomponents and activities indicators are, in general, SMART, except for the already mentioned Component 3[22].

Relevance analysis of the Project regarding coherence in the design and the Logical Framework Matrix

[21] As it was mentioned, this is defined as "the capacity of a social or ecological system to absorb any alteration without losing its basic structure or its way of functioning, its capacity of self-organization, or its capacity of adaptation to stress and change" (IPCC, 2007, p. 87).

[22] The acronym in English SMART summarizes those qualities that the indicators must have: Specific, Measurable, Achievable, Relevant and Temporal, in the sense that it could be followed up during a period of time.

The design document is of great technical quality. The logical chain of results reflects the underlying causal hypothesis. Nevertheless, the execution of the project would have been easier if the components and the natural environments of operation for the three executive entities had been matched (INTA/CNTE, INTA/CIRN, MINAGRO/ORA) and some of the training from component 3 in activities 1 and 2 had been incorporated. Most commonly, the indicators are specific, measurable, relevant and monitorable (SMART). Nonetheless, the indicator of the GO should reflect impacts and not only the coverage of the intervention, in line with the definition "resilience to climate change from small-scale family producers". In addition, the way in which the advances at the component level should be measured must be clarified.

5.4 GENDER, YOUTH AND INDIGENOUS PEOPLES MAINSTREAMING IN DESIGN.

Gender mainstreaming is proposed as such in the design document (page 89) and is emphasized (either descriptively through redaction, or by identifying the indicators disaggregated by gender) for some components (3), outputs (1.2.) and activities (1.1.2., 1.3., 1.3.1. and 3.1.3.). In the insurance subcomponent, given a scenario of disparities in the access to risk management tools, the emphasis in the disaggregated measurement between beneficiary men and women is highly relevant. In component 3, gender mainstreaming is complemented in all trainings with activities with substantial and specific content to that regard.

An analysis regarding the situation of youth is not so relevant to the formulation, except for the disaggregation of some of the indicators (the GO, from activities 1.1. and 1.3. and activity 1.2.3.). Furthermore, beforehand, it does not seem relevant that this social group had particular support with respect to the project objectives.

With regard to the indigenous peoples, it is a subject present in the project. Originally, in the design, specific activities for these communities were incorporated (activities 1.3.1.: assistance for the indigenous peoples in the construction of orchards for fruits and vegetables with irrigation and breeding of small animals). Later on, during the process of execution, interventions in favor of the indigenous communities have been multiplied: community dams have been built in Machagai (150 families), a water-tank structure for the Wichi community is about to be completed, the subject of climate change has been incorporated into the training of technicians in the Impenetrable (Chaco) and training about this subject is being planned for producers.

Gender and youth mainstreaming, and approach to indigenous peoples.

Gender mainstreaming is officially taken up timidly in the project design, through the disaggregation of some of the indicators and the inclusion of the subject as a substantial subject in trainings. Nonetheless, even though it is not explicit, the project has a great impact in this regard as the constructions to provide for access to drinking water (subcomponent 1.1., the one with the highest budget allotment) ease the practice of carrying out water, which is most commonly conducted by women and children, providing for an improvement in their quality of life and availability to perform other tasks. In the project design, the relevance of youth is taken carefully and specifically addressed and without much thoroughness, as that of indigenous peoples.

6 PROJECT EFFECTIVENESS

In this section, the degree of achievement of the proposed goals is analyzed, taking into account its quality and opportunity regardless of its costs (the budget performance will be analyzed in the following section). This section focuses on the analysis of the positive effects expected in the program design, mentioned as goals, components, subcomponents and activities of intervention, described in the goals of the LFM. The study will take into account the degree of progress achieved so far, after 70% of the intervention period.

The fact that there is no measure exercise of the Base Line as first activity of the Project does not prevent other conclusions in connection with the achievement of the goals according to the Indicators in the different levels: the comparison which will be used primarily is the information from the base line mentioned in the LFM and the latest measure available in the Annual Report 2016 sent to Adaptation Fund.

Furthermore, this section pays special attention to the distribution of benefits that the Project generates among the different social groups linked. In other words, it is not only an analysis of the cumulated achievements but also of the relative achievements. In this way, a study is included, which broaches the results in gender perspective on one of the more vulnerable social groups (young people) and the indigenous peoples mentioned in the project.

6.1. EVOLUTION OF EXPECTED POSITIVE EFFECTS AT GLOBAL LEVEL

According to the Annual Reports sent to the AF, after three years of the implementation of the Project (October 2013) and after a year and a half of its completion (March 2018), the achievements measured according to the indicator of its general goal account for a 35%. Such indicator counts the number of vulnerable families that have implemented the adaptation measures to climate change as a direct consequence of the project actions. Until October 2016, the number of such families reached 1,391 out of an expected total of 4,000.

Table 2. Indicators of the General Objective and its measurement.

Type of indicator	Indicator	Baseline	Progress from the beginning of the Project	Goal at the end of the Project	% of current progress
General Objective	# of vulnerable families to the negative effects of variability and climate change.	To this date, adaptation measures to climate change have not been implemented.	**Total families 1,391** Families with a woman as head of household: 153 Families with a young head of household (younger than 29 years): 369	4,000	**35%**

Source: Annual Report 2016 to AF

Considering that the total outlay accounts for a percentage similar to the total budgeted (38%), it is reasonable to estimate that the project efficiency has reached a 30-40% as of the date against the final target mentioned. This represents a modest step. In the remaining time, efforts must be made and measures implemented which ensure a more rapid implementation for the remaining time of the implementation.

Given that the LFM does not clearly identify the indicator at a component level and that the quantification of subcomponent indicators is foreseen at the end of the project, in order to verify the progress made so far we have quantified progress at the level of the activities and with the interviews carried out. Such interviews show that, beside the manner in which components were designed, actually the Project has been structured around three large courses of action: adaptation measures at farm level through the institutional structure of INTA Extension; actions to develop risk-transfer instruments that stabilize the incomes of producers through the coordination between the MINAGRO/ORA, provincial ministries and insurance companies; finally, it improves the collection of climate data, integration of existing networks and generation of an early warning system through INTA CIRN, in cooperation with ORA and with some provincial administrations. Trainings have been complementing each of these lines.

Each of these courses of action is articulated around the organizational leadership of one of the technical actors (which does not exclude the existence of inter-actor cooperation), involves a universe different from recipients (more vulnerable producers at farm level, small and medium producers in the risk transference, and every actor, but mainly the technicians in improving the climate data), and has different predominant territorial sceneries (the intervention is preferably developed at territorial, provincial and central level, respectively.) The aforementioned suggests making an analysis of effectiveness following these three courses of action, adding in each case the trainings carried out.

Evolution of expected positive effects at global level

After three years of the implementation of the Project and after a year and a half of its completion, the achievements measured according to the indicator of the GO account for a 35% (# of vulnerable families which have implemented the adaptation measures to climate change as a direct consequence of the project actions), 1,391 out of an expected total of 4,000. A 38% of the project budget has been disbursed so far. Therefore, it is reasonable to estimate that the global effectiveness has reached a 30-40% as of the date regarding the final target, which implies a modest progress.

6.2. EVOLUTION OF EXPECTED POSITIVE EFFECTS BY COURSE OF ACTION

6.2.1. Effectiveness of territorial intervention (subcomponents 1.1 and 1.3)

This course of action is led by INTA/CNTE, through its territorial network of Extension, including subcomponents 1.1 and 1.3 and it has a budget allotment of 41% of the total. Under the direction of the National Coordination Office for Transfer and Extension (CNTE), it is executed through the

INTA Regional Offices in Chaco/Formosa, Corrientes, Santa Fe and Tucumán/Santiago. These head offices have under charge a certain number of Regional Projects with Territorial Approach (RPTA), some of which are formally associated to the project (the list of the associated 15 RPTA is in Annex II)[23] . Each RPTA has a coordinator in charge and a series of technicians who interact face-to-face with producers/recipients of the project and who ensure the implementation of the activities.

As the following table shows, in general, all activities of subcomponent 1.1 report a high degree of progress against the targets originally established. If only the indicators originally established in the LFM are considered, the effectiveness is 59% at the moment, which increases up to 90% if the impact is solely measure in terms of families. The average of effectiveness of subcomponent 1.1 thus is 71% of the target established for the end of the action, which is very good considering that a year and a half of implementation is remaining and that there are many works underway. Unlike subcomponent 1.3, whose activities are lagging behind and that, except for activity 1.3.4., it shows an effectiveness average of 16% against the projected final target.

Table 3. Course of action of land working: indicators, targets and progress by activity as of October 2016.

Typo de indicator	Indicator	Baseline	Progress from the beginning of the Project	Goal at the end of the Project	% of current progress
Activity 1.1.1. Water well drilling to have access to ground water of quantity and quality	# of drilled wells to have access to ground water	No drilled wells in target communities.	Total wells: 78	138	**57%**
		No assisted families.	Total families: 167 Led by women: 32 Led by young people: 4	138	**121%**
Activity 1.1.2. Design, refurbishment and building of roofs readapted for rainwater collection and building of water tanks linked to be used as reservoir.	# of families with roofs readapted for rainwater collection and water tanks (disaggregated by gender)	To this date, there are no reservoirs or roofs readapted for rainwater collection in the intervention area.	Total families: 407 Led by women: 37 Led by young people: 162	266	**153%**
Activity 1.1.3. Development of water collection and storage systems: building of community reservoirs for big and small livestock.	# of reservoirs/dams	No reservoirs/dams.	Total reservoirs/dams: 6	145	**4%**
		No assisted families.	Total families: 35 Led by women: 3 Led by young people: 6	739	**5%**

[23] For more information regarding the role of the RPTA in the strategy of the territorial development of INTA, please visit: inta.gob.ar/documentos/los-pret-como-instrumento-del-inta-para-aportar-al-desarrollo-territorial-en-argentina

Activity 1.1.4. System of multipurpose water supply for human consumption, animal watering and irrigation of vegetable gardens, fruit gardens and pastures.	# of multipurpose water supply systems built	There have not been initiatives to build multipurpose water supply systems so far	Total of multipurpose water supply systems: 33	140	**24%**
		No assisted families.	Total families: 112 Led by women: 9 Led by young people: 81	140	**80%**
Activity 1.3.1. Assistance for indigenous peoples in the building of fruit and vegetable gardens with irrigation and small animal breeding.	# of indigenous families receiving technical assistance.	15 families with fruit and vegetable gardens with irrigation and small animal breeding.	Total families: 4 Led by women: 2 Led by young people: 1	82	**5%**
Activity 1.3.2. Management and use of forage resources	# of families receiving assistance in the management and use of forage resources.	29 families receiving assistance in the management and use of forage resources.	Total families: 23 Led by women: 1 Led by young people: 0	473	**5%**
Activity 1.3.3. Implementation of soil management techniques through tillage following the level curves and/or the incorporation and management of cover crops and green fertilizers.	# of families receiving assistance in the implementation of soil management techniques.	No assisted families.	Total families: 0	119	**0%**
Activity 1.3.4. Adaptation to extreme temperatures by means of crop protection structures.	# of families receiving assistance by means of crop protection structures.	20 assisted families.	Total families: 128 Led by women: 23 Led by young people: 10	272	**47%**
Activity 1.3.5. Incorporation of equipment and improving of facilities.	# of families receiving technological assistance and improvement of facilities.	20 assisted families.	Total families: 25 Led by women: 1 Led by young people: 0	109	**23%**

Source: Annual Report 2016 to AF.

Note: The indicators in red do not appear in the original LFM, they have been incorporated to the annual reports taking beneficiary families as unit of measure. This incorporation allows a better measurement of the impact on the community works and facilitates the calculation of the GO indicator.

This logic of progress is better explained with information that arises from the interviews. All the work in these two subcomponents is based on the proposal of rural development with a territorial approach of INTA. In this institution, the territorial development approach began with the National

Program of Territories as a research program in 2005. In 2012, RPTA were born, institutionalizing the approach and activating the role of INTA as public policies articulator in the local arena[24].

This vision replaces the previous emphasis and articulation around the value chains of different products and the relative disassociation of the research with the extension. The RPTA are meant to be platforms rather than projects, since their objective is to combine the demand of producers, extension and research, thus producing an endogenous innovation adapted to the different requirements and needs of each community. In this view, the access to water begins to shape as an essential problem for producers and which INTA can incorporate.

Consequently, the Project perfectly fits with the previous lines of work by INTA and contributes to expand them in a sort of positive feedback. This strategic approach as well as the great porosity and presence of INTA in the territory allow and boost the impact of the project at recipient level. Accordingly, INTA is another actor, although its heavy presence and large technical capacity place it as a key actor. Therefore, in case of a specific need, the technicians in the territory must not only contribute expert solutions but also be in charge of achieving a coordination of the required actors to correct it. In this context, the Project intervenes when none of the actors involved can give a solution to an aspect of the problem.

Originally, the Project, through INTA, has been in charge of the purchase of materials and the cooperation of actors (including the creation of training instances and workshops to define needs and make plans of works). The actors involved are producers, who have contributed workforce, which is funded through an training labor program of the Ministry of Labor with theoretical and practical components and which can be required by the RPTA coordinator; universities (mainly for the analysis of water quality); municipalities which have funds transport, made ditches, facilitated meetings, etc.; INTI (mainly for activity 1.1.1, since this institute has developed a water well prototype for family production very accurate for the situation that this project faces. Moreover, the project funds travel expenses of 3 (three) technicians to manage drills and train producers); and water provincial agencies (legally, the control of drinking water and drilling-mapping is under charge of the provinces and appropriate bodies must be involved.)

This articulation scheme hinders the execution of activities, in many cases the coordination of actors is a hard work, and has lengthened implementation times. For instance, INTI has only three technicians to manage drills and works must wait for their time; the municipality aligns its interventions with politics' time in electoral years, which produces additional wait times; not only producers accept to join to the training labor program, etc. However, this work method ensures firmly the sustainability of interventions, holds local actors responsible for the maintaining of works and its replica, proposes learning processes and facilitates the empowering of recipients.

[24] For more details about the extension strategy of INTA based on territorial development, please visit: inta.gob.ar/documentos/enfoque-de-desarrollo-territorial.

Illustration 3. Articulation of actors in territory (subcomponents 1.1 y 1.3)

Source: Own compilation.

During the execution, this complex articulation was found to be in need of a reinforcement to ensure the foreseen impact. As works represent a result of the contribution of several actors, the processes defining needs required a better organization, as their quality was not always ensured (for instance, the workforce was not always skilled and a part of it was in a process of learning water wells building or farm improvement, it sometimes made mistakes in completing or understanding the instructions) and work completion was not always reached with the required quality. On the other hand, territorial technician sometimes did not assume their responsibility on the final impact of the intervention. At that moment (May 2015), a land monitoring mechanism was implemented under charge of an external expert, who was hired by the project-supervised works *in situ* and gave recommendations to RPTA coordinators and/or farm technicians. There were also talks and trainings to agree that they were responsible for making not only the product (e.g.: well), but also the result (e.g.: consumption of drinking water) and the impact (e.g.: the community starts its productive activities.) This responsibility is obviously shared with other local actors, such as municipalities. In any case, this external monitoring stage has been effective and positive for a better progress of implementation. However, it still finds problems to guarantee that INTA ensures certain quality standards in the completion of all works, which UCAR has detected and now is monitoring.

Regarding the identification of demands, INTA has been working on the intervention territory with projects PROFEDER[25]. The demands for infrastructure and investment that are funded by the Project were identified a long time ago by INTA, although thanks to the project, the demands expanded were systematized, put into practice, and enabled the incorporation of new local actors. The coordination work with what was previously known as Family Farming Secretariat (SAF), today Family Farming Sub Secretariat of MINAGRO, has allowed expanding referents and conducting actions in remote areas, such as Impenetrable Chaqueño, where there was no connection before.

Therefore, the CNTE proposal towards the territory is conceptually and strategically clear, although flexible regarding how each Regional Center and each RPTA can adapt it to their own situation and particular needs. In practice, the 15 associated RPTA not always work with the project in a constant way[26]. On the other hand, the INTA Extension Office discards the priority identification proposals from the land which are not pertinent, do not ensure a duly coordination with other actors or lack of sufficient quality. Finally, another influence is the execution capacity of each work team. For INTA territorial actors adding the project represents another difficulty, since at an institutional-organizational level it implies changing working logics and institutional dynamics (times, routines, layouts, etc.). Given this situation, some actors have taken it as an opportunity and other as an additional burden.

Of all of the intervention typologies proposed in components 1.1 and 1.3, those considered more appropriate by the local community are chosen and each community applies a different criterion. In some places, it is required to make new typologies, in others, producers demand what they already know what to do. Other actions are proposed by INTA. In this sense, achievements in some typologies are greater than the ones foreseen and, in others, smaller. Consequently, in drills (1.1.1) and installation of roofs and water tanks (1.1.2) the expected goal will be surpassed. However, as for dams (1.1.3), the goal was overestimated and there was an omission regarding the measurement of its impacts, since they must be also measured in terms of benefited families (that is the reason why an indicator was added in such regard). 139 were expected to cover 739 families. Two large dams are being finished in Chaco, which reach 150 families, and 6 small dams have already been built for 16 families in the same province. It is expected to make another large dam in Santiago del Estero, in coordination with the Development Agency of the province.

Regarding the optimization practices of subcomponent 1.3, when working on the project in coordination with the same family, there was a lot of emphasis in access to water as a first step: producers could not work on their gardens or improve their livestock if they previously lack in water for that purpose. At this moment, it is being balanced and demands for subcomponent 1.3 have already increased for future planning. On the other hand, what it is proposed by subcomponent 1.3 is what the INTA Prohuerta Program (under CNTE jurisdiction) has been covering since a long time in the same territory with the same technicians and thus, such activities

[25] The INTA territorial technicians are associated with PROFEDER projects, of technical assistance, with 3-year objectives to work with producers.

[26] A RPTA in Corrientes has not entered into the activities, another in Chaco has entered in the first stage of execution but not in the second, another in Santa Fe recently joined in 2016.

can be carries out as part of the project or through this program[27]. The visit to the territory also allowed confirming that by the year 2017 Prohuerta budgets have increased substantially at national level, which implies that this program could assume part of the activities of the component once the project is finished.

In this subcomponent, the activity 1.3.2, about forage and agroforestry systems, has progressed in Villa Angela (Chaco) mainly because producers are stockbreeders. Given that it was difficult to progress in other places, it is possible that here is no demand to achieve the expected goals. For activity 1.3.3 about management techniques of soil, curves and green fertilizers, was mainly applied in Goya (Corrientes) was the main place to work. As regards activity 1.3.4, about greenhouses and drip irrigation, it is also possible that the goal could not be achieved. Finally, activity 1.3.5 about stockyards, fences and feedlots will be carried out in electrical fences for grazing management in Santa Fe, Santiago and Chaco, probably less in Corrientes. In any case, for the remaining part of the project, the planning already made largely increases the weight of this subcomponent, therefore, the achievements of the indicators should improve in the future against current achievements.

As regards trainings, there have been many of them in these last two subcomponents although, actually, they are included formally in component 3, since there are many which cannot be separated from works or farm management[28]. Many of them, as it was mentioned, were activated as a demand of the labor-training program of the Ministry of Labor.

Evolution of expected positive effects of territory intervention (subcomponents 1.1 and 1.3)

It is led by INTA/CNTE and based on the rural development proposal of INTA, and is executed through the territorial network of INTA Regional Offices (RPTA) Chaco/Formosa, Corrientes, Santa Fe and Tucumán/Santiago. It has a budget allotment of 41%. Every activity of subcomponent 1.1 shows a high level of progress: the average measurement of its indicators reaches a 71% of final goals. Activities of subcomponent 1.3 are lagging behind, with an effectiveness average of 16% against the final goal.

The activities of this Project match in large part with previous INTA Extension work lines, and contribute to expand them in a sort of positive feedback, although sometimes they mean an additional burden of work. Water works, based on INTI or INTA prototypes (which ensure technical assistance) are spread through a complex network of actors: the project purchases materials and generates training stages, producers contribute workforce (funded through a training program of the Ministry of Labor), universities contribute water analysis, municipalities fund various expenses and provincial water agencies validate the activity. The work in output 1.3 is more delayed because recipients emphasized that they could not work on their gardens or improve their

[27] The ProHuerta Program has 25 years of work experience in the territory; it is based on the participation and organization of communities and aims to develop local production systems for the self-sufficiency and commercialization of agro-ecological foods.

[28] For instance, INTI goes to areas where drills take place and trains producers on how to use the mechanical driller in a theoretical and practical course.

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livestock if they previously lack of water to carry it out. At this moment, it is being balanced and demands for subcomponent 1.3 have already increased for future planning.

In May 2015, a land monitoring mechanism was implemented under charge of an external expert to ensure the completion of processes and guarantee impact achievements. The monitoring of territorial action has improved because of this reinforcement, although there still are quality deficiencies in the completion of some works.

6.2.2. Effectiveness of intervention for risk transfer (subcomponent 1.2)

This course of action is led by MINAGRO/ORA, it is referred to subcomponent 1.2 and it has a 24% budget allotment of the total. The component is based on the coordinated work of MINAGRO/ORA with the Ministry of Production of the province of Corrientes, with a chamber of insurance companies and with a series of insurance companies that work in agricultural risk coverage in the project territory. This subcomponent is fundamentally a pilot exercise and involves an important innovation process, since, at the beginning of the project, there is no market to generate insurances that cover agricultural production of small family producers.

Unlike the previous course of action, in which the achievement of the goals has a cumulative effect, in this one the elected indicators are threshold-types (a great critical mass of cumulative work is needed to achieve them) or dichotomy-types (they are either achieved or not). Therefore, the fact that the feasibility study on oil and cotton production could not be implemented, one of the activities has no achievement; unlike the study on vegetable production, which after a long process could be carried out. The implementation of the pilot insurance policy is under way and so far, it involves a lower number of expected families (74% of effectiveness). It is still necessary to incorporate new families in the second year of the contract. The implementation of the current premium finishes on January 31 2017: ORA is working to finish the new tender in December 2016 and to ensure a second tranche from February 1 2017 to January 31 2018. The activity related to the pilot exercise assessment is still pending the completion of it. The efficiency average of subcomponent 1.2 is 52% if it drawn up from the established goals for the end of the action.

Table 4. Course of action of risk transfer: indicators, goals and progress as of October 2016 by activity.

Type of indicator	Indicator	Baseline	Progress from the beginning of the Project	Goal at the end of the Project	% of current progress
Activity 1.2.1 Feasibility study to develop a Pilot Plan of global insurance against multiple risks addressed to small-scale cereal, oilseeds and cotton producers.	Development of feasibility study	To this date there have been no studies carried out.	0	1	**0%**

Activity 1.2.2 Feasibility study to develop a Pilot Plan of risk management addressed to small-scale agricultural producers whose main activity is horticultural.	Development of feasibility study	To this date there have been no studies carried out.	1	1	**100%**
Activity 1.2.3 Implementation and monitoring of Pilot Program's execution.	# of families included in Pilot Programs.	No insurance coverage.	Total families: 581 Led by women: 50 Led by young people: 107	787	**74%**
Activity 1.2.4 Assessment of Pilot Programs, previous experiences and development of proposals and recommendations to local governments.	Development of an assessment of Pilot Programs made.	No assessment carried out.	None	1	**0%**

Source: Annual Report 2016 to AF.

Unlike the situation in the previous course of action, the proposal the project presented to MINAGRO/ORA did not entirely match with its main work area. Although the Office has already been working on insurance development for family producers for a long time, this is not their common productive sector, since their work on early warning and information systems to manage risks is mainly orientated to small and medium producers. However, the Office has aligned with AF and UCAR demand to work for this target of very small producers, tackling several challenges mentioned below. The commitment was mainly made because ORA had confirmed from data analysis throughout the years that the State should be in charge of the climate change variability, since it is seriously affecting producers in their everyday lives, and specially, the smallest producers.

The first challenge was the **identification of the target population**. Unlike INTA, which has already been working with its target for a long time, since its extension network, it was difficult for ORA not to have a base line that facilitates the identification of possible targets. As mentioned before, the previous Agricultural Census in Argentina with statistical strength dates back to 2002, thus it was uncertain how many family producers were in the project's area, their location and type of production they carried out. This affected the insurance generalization, as it finally had to develop in a small area with a great concentration of producers in order not to trespass the identification cost of companies' targets, which would have very much increased its price. Originally, the insurance was meant to be more massive. The delay in the signing of the ORA/UCAR agreement, which could only be effective one year after the implementation, also caused a non-delayed policy design and reduced the time of an eventual target analysis.

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In this framework, there are two pilot studies proposed for the current Project by ORA to create tools of risk transference for two types of production: horticulture and oilseeds/cotton.

In both cases, it was all about developing the product: **to design a policy acceptable** for companies, producers and the province itself. In Argentina, multi-risk insurances could not have been implemented so far, not even for large producers, and thus two specific and different policies should be made for the two types of production. The horticulture was not covered until now in Argentina and the production of oilseeds and cotton, just for large producers.

ORA has previously worked with the Ministry of Production of the province of Corrientes in a very small pilot insurance experience for the horticultural production within PRODERNEA, a program by the Ministry of Agroindustry[29]. The goal of motivating a public-private association to foster this type of insurances derived in the passing of provincial Law (Law 6.125) which proposes a policy subsidy by the state, to move slowly the risk of insurance companies, with a voluntary insurance logic. Therefore, the first task was the identification of risks specific of the production of some horticultural products (tomatoes and peppers) in accordance with climate characteristics of the zone. From that information, negotiations over an acceptable policy for all stakeholders must take place.

[29] Para más información sobre el programa PRODERNEA, ver: http://www.minagri.gob.ar/new/0-0/programas/prodernea/que_es/index.php. El pequeño proyecto piloto, realizado en el 2008, se llevó a cabo con algunas de las empresas ahora involucradas y fue a muy pequeña escala: 70 productores, 10 ha y un monto asegurado de 839.904$.

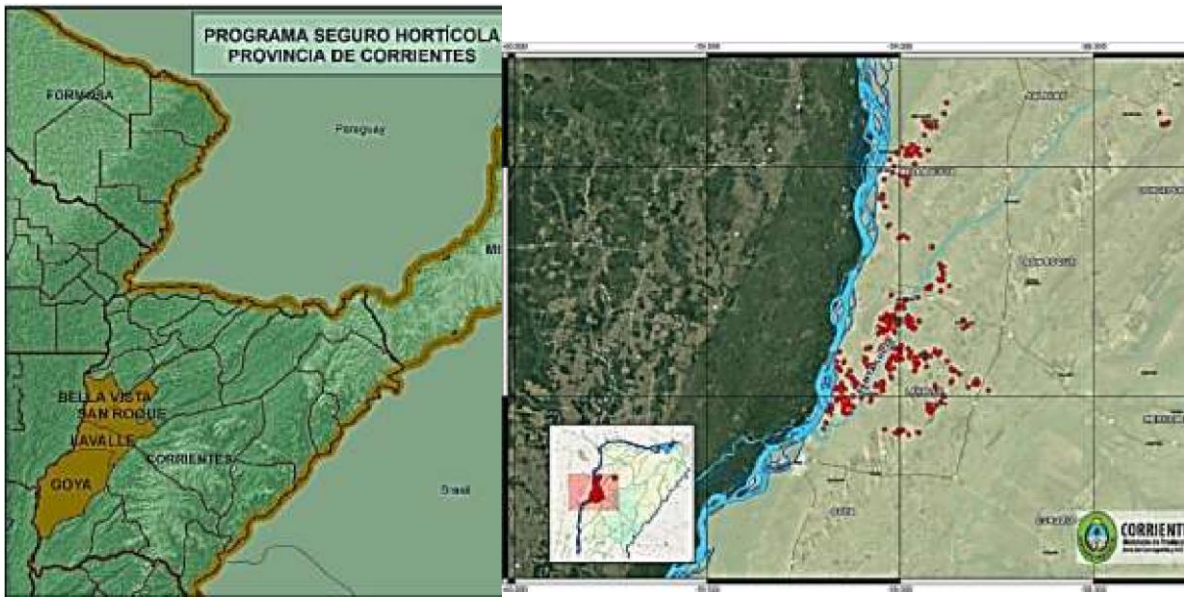
Map 5. Stations for climate data collection in the province of Corrientes.

Source: Ministry of Production of the province of Corrientes (http://www.mptt.gov.ar/site13/centrales/)

For the horticulture, the experience has reduced to a watershed in the province of Corrientes[30] (save to a group of producers in the North of Santa Fe which will be incorporated at the end of 2016), where that production in greenhouses is very important and has a great territorial concentration. It could not be incorporated to the rest of the Project's provinces because there were not enough stations providing meteorological data and because producers were geographically very scattered. The scattering and lack of data make producers' insurance anti-economic and thus ORA is already working on another type of tools of risk transference (such as seeds revolving funds) for these situations.

[30] The insurance covers departments of Bella Vista, Goya y Lavalle (including 10 ha in Concepción and San Roque) Lavalle is the core zone, the 84% of risk is there, and the 15% in Bellavista.

Map 6. Departments involved and target's location of horticultural insurance pilot program (Corrientes).



Source: Ministry of Production of the province of Corrientes (http://www.mptt.gov.ar/site13/centrales/)

The main steps and challenges found in the process are described below:

- Trainings were carried out in insurance companies in the special features of the type of crop under charge of INTA horticultural experts from experimental stations in the zone. In order to obtain more precise climate information, an agreement with INTA CIRN (Castelar) was signed to join this body's stations with those of the province. Even so, when the policy was created, there was not enough climate information on some aspects, although an agreement with other companies could be reached.
- It was decided to cover the recovery cost of planting again instead of the cost of production loss because it was not possible to value it due to the great variability in prices.
- In order to register producers one by one, a group of was created.
- Tomato and pepper production were the only productions incorporated so far. For the annual policy covering the harvest 2017, as it has more time to collect more data, risk will be diversified with other products and zones. Diversifying in the territory and in the type of product will reduce the policy cost.
- For the moment, the insurance is only against hail and wind, not against floods or other risks, although a multi-risk coverage is being negotiated.
- Then, the challenge was to get re-insurance without reliably knowing the risk. However, in the bidding process there was a huge acceptance by re-insurers (unlike the situation in PRODERNEA project), which reflects the improved techniques obtained in the policy proposed in the project.

- Originally, the companies were reluctant to participate in order not to risk their prestige in other areas, and it was very difficult to convince the companies. To ORA, organizing the stakeholders and foster a panel discussion was also difficult in the distance.

Illustration 4. Articulation of stakeholders in the generation of insurances (subcomponent 1.2)

Source: Own compilation from documentary sources and interviews.

The horticultural policy developed for the Project is the first policy in the region for this type of product. After the definition of the policy, the policy had to be approved by the National Insurance Superintendence, which finally happened. Once approved, the bidding was launched with the insurances companies to proceed with its implementation, which is currently in process.

For the next year, the policy is being reconsidered in order to change some issues, increase the number of targets and diversify the risk. Within the framework of the NEA Agricultural Federal Council, some regional insurance policies are being introduced in the neighboring provinces.

The **insurance policy for the small-scale cereal and oilseed production** could not been developed: at one point in the process, ORA decided to discard this action. Companies were reluctant to work with family agriculture and the negotiating process for horticultural policy was very hard working. It was assumed that doubling the effort would have few results for both processes. Actually, for small producers, who have a diversified production, the logical action to take would be generating a multi-risk insurance or income insurance, instead of a specific insurance for each product. However, that could never be accomplished in Argentina. The idea itself of insurance is also difficult for this type of producer who never used them. Proposing that the producer is also responsible for managing his or her risks is a change in paradigm. Furthermore, the private sector

has been historically reluctant to work with these insurances, and progress is slow. The type of projects like this project allow accelerating, maintaining and fostering these learning, juncture and agreement processes between stockholders, such projects are needed progress down this road. Accordingly, although progress in the component is not spectacular, it is substantial.

As regards insurance companies, ORA called the companies through the Insurance Chambers[31], being Adira's companies (La Segunda, Sancor, San Cristobal and Mercantil Andina) the most interested companies, since they have offices in Santa Fe and institutional infrastructure in the project area[32]. The Chambers have long been discussing with ORA, Provincial Ministries and provincial producer Chambers in public/private panel discussions (in Mendoza, Rio Negro and in the NEA through PRODERNEA). However, just one policy has been achieved so far: the policy contemplated within this project's framework.

Furthermore, the financial risk taken by the companies is low against the risk frequently taken[33]. This shows that the interest in the companies is not yet assured. It is not possible to think of a product without the state subsidizing the policy. In the future, it is a potential business as long as there is a minimum of state intervention assured, as occurs in the rest of the countries. It could be assumed that as years pass by, companies will increasingly cover a greater percentage of production cost. Meanwhile, it is essential that the state finance the cost of part of the premium.

Evolution of expected positive effects of intervention for risk transfer (subcomponent 1.2)

Led by MINAGRO/ORA and based on the coordinated work with the Ministry of Production in Corrientes, industrial organizations and insurance companies, it aims to generate and test insurance policies for family agricultural producers against climate risks, a non-existing product in the market. Two pilot exercises were expected (one for oilseed and another one for horticulture), but only the latter could be developed. The policy was negotiated in a tripartite round-table (companies, ministry of provincial production and ORA/MINAGRO) and it was approved by the Superintendence of Insurance. Currently, the first of two years of contract is near completion. Next year, the product will geographically expand and increase the amount of products covered. The experience gained by all parties is essential to beat the existing inertia against the stay of some traditional insurance products. It is important to record the learning process.

[31] Argentine Association of Insurance Companies, Adira and two chambers of mutual companies.

[32] The companies that form Adira have a net of over 100 agencies all over the country and their work is very much connected with agricultural cooperatives. In the case of La segunda (the company that finally was more committed to the project), there is a very strong vocation for supporting regional economies. The demand for new policies for new products always exists from cooperatives but the possibilities of Adira are overcome by demand, as for companies they are not very interesting products (for further detail, please read the chapter about project's actions sustainability.)

[33] Policies are assumed in a 2.5% by each of the four Adira companies and a 90% by the re insurance. Those companies in their usual transactions, in other products, assume a 70% of risk and assign a 30% of re insurers. The total insured sum ended in 40 million pesos: this means 1 million ARS by company throughout this year. The next year, the sum will reach 1.3 million ARS. In other words, this is not a very profitable product, but nor the financial risk is large for the private sector.

The action has a 23% of budget allotment. The implementation of the policy in the first year covers a greater number of expected families (a 74% of effectiveness), although it is still an ongoing activity which will incorporate more addressees the next year. The activity in relation to the pilot exercise evaluation is yet to finish, which will be very important to ensure the learned lessons of a product which still needs to be consolidated by addresses and companies, as well as ensuring the support by the State for some years. The effectiveness average of this subcomponent is 35% of the final action goal.

6.2.3. Effectiveness of intervention for the generation of an EWS (subcomponents 2.1. and 2.2)

This course of action is led by INTA/CIRN jointly, by its Climate and Weather Institute and, in a lesser amount, its Soil Institute and by MINAGRO/ORA. It has a 26% of total budget allotment. Under the instructions of the Office of the Natural Resource Research Center, it is implemented mainly in INTA's land in Castelar with the support of INTA Regional Center for land work, for subcomponent 2.1. For subcomponent 2.2, INTA/CIRN and MINAGRO/ORA work jointly with provincial authorities of the project's area of influence.

As the following table shows, in general, every activity of subcomponent 2 shows an acceptable degree of progress against the originally established goals. Those of subcomponent 2.1 have a 56% of efficiency against the goals established for the end of the action. Therefore, it is logical to have a further delay in subcomponent 2.2 (44%) since its completion largely depends on the previous output's progress. On average, the component reports a 50% of efficiency against the final expected goal.

Table 5. Course of action of risk transfer: indicators, goals and progress by activity as of October 2016

Type of Indicator	Indicator	Baseline	Progress from the beginning of the Project	Goal at the end of the Project	% of current progress
Activity 2.1.1. Development, assembly, installation, adjustment and monitoring of automatic meteorological stations.	# totally operative automatic meteorological stations.	8 monitoring stations connected to SMN/INTA monitoring networks, 35 automatic stations and 22 rain meters in project's area.	16	18	**89%**

Activity 2.1.2. Conversion of simple automatic stations into stations of complete measurement.	# totally converted simple automatic stations	No converted stations.	10	10	**100%**
Activity 2.1.3. Network integration after an inspection and exhaustive inventory of automatic stations and existing data collection.	% of meteorological networks integration	No integrated networks.	40%	100%	**40%**
Activity 2.1.4. Strengthening of local nodes Information Systems.	% of totally operative local nodes Information Systems.	No operative information systems.	60%	100%	**60%**
Activity 2.1.5. Interoperability, standard and data quality, database unification of agro and hydro-meteorological from local and national institutions.	% of integrated information system online availability	No availability of the integrated information system.	50%	100%	**50%**
Activity 2.2.1. Compilation, integration and unification of database and geo-referential maps for the intervention area regarding the hydrological, topographic, soil, hydro-meteorological, meteorological and geomorphological characteristics	% of compilation and evaluation of databases and geo-referential maps for the intervention area	0%	50%	100%	**50%**
Activity 2.2.2. Tests done in demonstration plots to evaluate water requirements of cotton crop.	# of tests done	None.	0	3	**0%**
Activity 2.2.3. Risk maps in terms of droughts, water deficit and excess water for implanted and natural pastures.	% of project's surface with risk maps.	35% of project's area with risk maps developed.	55%	70%	**79%**

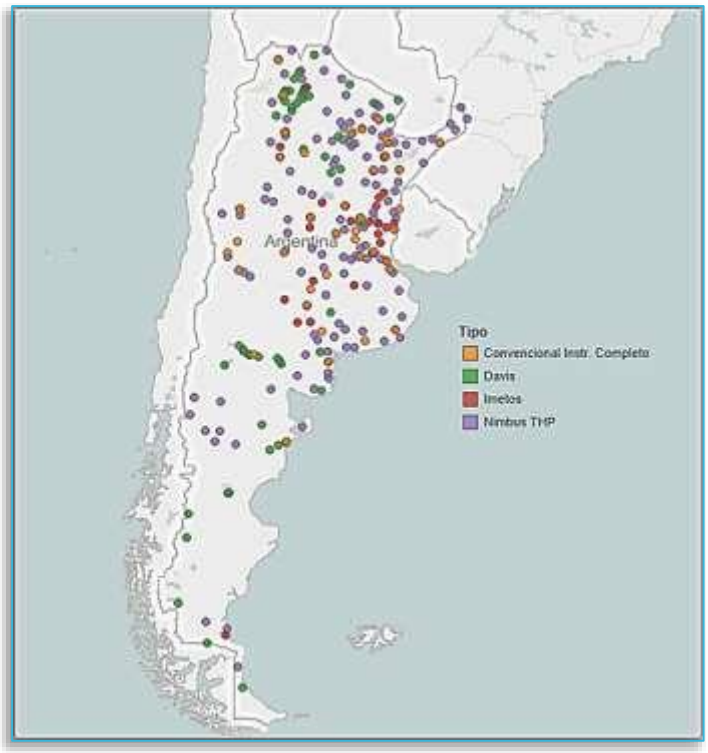
Activity 2.2.4. Development of a soil moisture monitoring system based on the operative implementation of the water balance algorithm.	% of implementation of the soil moisture monitoring system.	30% of project's area with monitoring system installed.	50%	60%	**83%**
Activity 2.2.5. Analysis of scenarios of climate change and trends and its impacts on crop production.	% of developed analysis of scenarios of climate change and trends on crop production.	There are no scenarios of climate change at regional level or knowledge on crop impacts.	90%	100%	**90%**
Activity 2.2.6. Integration of water warning component into the early warning system.	Development of early warning system.	There is no water monitoring system and determination of vulnerability on scale or appropriate places.	None.	1	**0%**
Activity 2.2.7. Meteorological warning component, integrated into the early warning system.	Development of early warning system.	There is no decision-making system integrated with climate warning components.	None.	1	**0%**
Activity 2.2.8. Development of a comprehensive web platform that allows access to early warning system.	% of web platform development.	0% of the platform developed.	50%	100%	**50%**

Source: Annual Report 2016 to AF.

This line of work matches with the priorities of those institutions that implement the components. Both CIRN (mainly the Climate and Water Institution) and MINAGRO/ORA have as the most important strategy of action the improvement of climate data to facilitate decision-making process. In both cases, they consider that climate variability is indeed affecting the production in all its forms. That is also confirmed in the interviews made to in-land producers.

Data collection in this case is not so adapted to the need of designing future climate change scenarios (which is a role taken by international bodies), but mainly to generate data on a small scale and with enough details to be useful to producers, particularly small-scale producers. This requires firstly, generating a heavier climate station networks that allows covering a larger number of parameters. On the other hand, this data must adjust to the conditions soil use, which arise from soil moisture maps and forecast of different regions MINAGRO/ORA generates. Finally, it must be integrated in a network for its joint analysis.

Map 7. Supporting structure – INTA Meteorological station network (SIGA System).



Source: INTA CIRN

The first step is to strengthen the climate station network existing in the country. Recently, INTA has incorporated this goal at national level, although it is not part of a strategy to climate change adaptation. At the beginning of the project, the institution had 150 stations located throughout all the country, which a very scarce grid for the necessary level of detail. On the other hand, its location, defined in consensus with Experimental Stations, met its investigation needs, generally in more productive zones. Given that the project prioritizes family economy producers and meteorological variability, the existing network was complemented by locating the new stations in areas socially or physiographically more vulnerable, which would allow generating data for smaller producers 'work zones and with more climate variability.

The new stations were built and assembled in the Sensor Laboratory of Climate and Water Institution in Castelar, with a prototype designed by INTA and with parts of national origin. The spare part stock, which is generated by the project and by the long experience and training of technicians from such institute, ensures the good condition and functioning of the stations in the short term. Despite the fact that the station network has not been institutionalized within INTA's framework, a maintenance manager from INTA or the provinces has been appointed for each station. This also contributes to intervention sustainability.

Illustration 5. Assembly of meteorological stations in Sensor Laboratory of Climate and Water Institution, INTA CIRN.

Source: INTA CIRN

The following results have been achieved so far:

- 15 new NIMBUS II INTA Meteorological Stations have been assembled/made and installed (which were specially modified for the project)
- 10 NIMBUS I INTA Meteorological Stations, which were already in land, have been adjusted/improved and fully featured with sensors.
- A new portable NIMBUS III model was designed (for ecosystem tests) and installed in territory[34].

[34] These are the first mobile stations that INTA designs and sets: NIMBUS3. They are managed by ORA, because they are used in productive plots for crop and water balance tests for experimental test of 1.2.2. They measure soil salinity, moisture and temperature, creating a profile needed for insurances. For more detail on mobile stations (designed along with INTA Extension), please visit https://www.flickr.com/photos/mcbelloni/sets/72157676877534345/

- Workshops and technical training sessions as well as sessions in land were given.

On the other hand, progress was made in the INTA station network assembly with provincial networks. Today in Argentina, each province is developing its networks. Besides this constitutes a progress, it also generates inter-connection subsequent difficulties. INTA's goal was to move forward this objective by a coordination strategy that was facilitated by the project, since it provides for financing of coordination and generation actions of institutional links. These actions are more than needed, since several institutions are reluctant to share their data. In the case of Province of Corrientes, an agreement was signed (in October 2015) between Central INTA, Association of Rice Planters of Corrientes (ACPA), provincial Ministry of Production and Entre Ríos Grain Exchange. In the case of Province of Chaco, although an agreement was signed between the INTA Regional Chaco-Formosa Center and the Chaco Ministry of Production (mid 2016), it is currently under a re-negotiation process to incorporate other local institutions and to be signed by Central INTA. Agreements with the other two provinces have not been reached yet. The following table summarizes the agreements reached at the end of the third year of implementation.

Although the result of the signing of the agreements is essential, its effective implementation is a key achievement for the accomplishment of the component's goals. Accordingly, the following step is a work of standardization of data characteristics, since in order to combine the information, it must have the same criteria (same format, time, interoperability, etc.). To that end, the software acquisition has been budgeted as well as the recruitment of experts in the subject.

Table 6. Meteorological Stations: INTA and provincial location

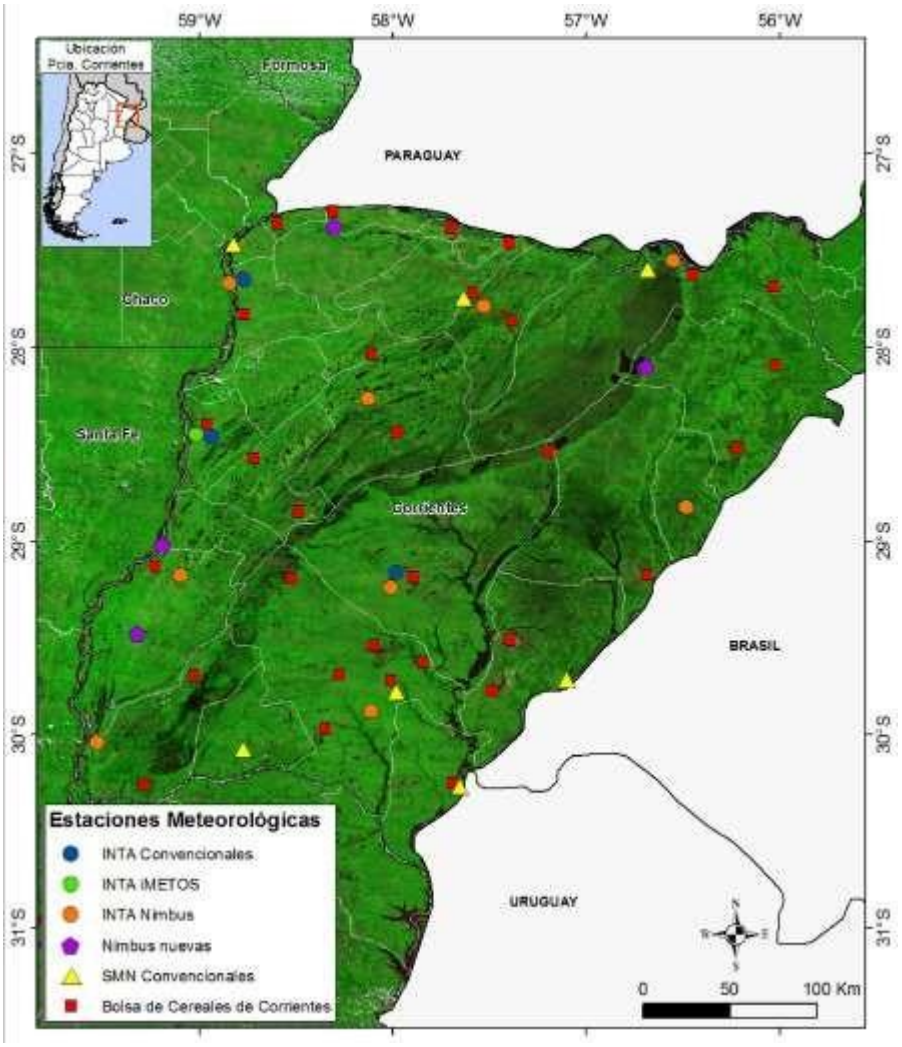
	Number of INTA Stations (Note 2)	**Measurements they can make**	**Number of provincial Stations** (Note 1)	**Measurements they can make**	**Any negotiations or agreements**	**Interconnection to a central system** (Date)
Corrientes	4 new ones 3 enlarged ones 2 portable ones	**Simple**: temperature, humidity, rainfall, soil temperature. **Full**: also solar radiation, atmospheric pressure, wind direction and speed, wet leaf. **Portable**: temperature, humidity, rainfall, hail, solar radiation, atmospheric pressure, wind direction and speed, and probe with 12 measurement points, moisture, salinity and temperature soil.	10 full 22 simple (Note 3) (Note 4)	**Simple**: temperature, humidity, rainfall. **Full**: also solar radiation, atmospheric pressure and wind direction and speed.	YES	The interconnection to a centralized system is contemplated (agreements and tasks are in current implementation) Agreement signed in 2015.

Chaco	4 new ones 2 enlarged ones	**Simple**: temperature and humidity, rainfall, soil temperature. **Full**: also solar radiation, atmospheric pressure, wind direction and speed, wet leaf.	10 full installed 10 full to be installed (possible further extension)	**Simple**: temperature and humidity, rainfall **Full**: also solar radiation, atmospheric pressure, wind direction and speed.	YES	The agreement is in negotiation for its signing (it is not still defined if they will form part of INTA central system or each institution will concentrate their networks' data on their own systems)
Santa Fe	3 new ones 3 enlarged ones	-	-	-	NO	NO
Santiago del Estero	4 new ones 2 enlarged ones	-	-	-	In analysis.	NO

Fuente: CINR/INTA

Note 1: EMAs (Automatic Meteorological Stations) distributed throughout the province are included.
Note 2: Only stations affected by the Project are calculated. 15 new NIMBUS II have been installed and 10 of EMAS NIMBUS I already existing have been featured with sensors (same with EMAs NIMBUS II). Total: 25 complete EMAs. 2 portable NMBUS III EMAs have been built.
Note 3: The same agreement expects to incorporate 100 stations into the Entre Ríos Grain Exchange (same network that covers the province of Corrientes.)
Note 4: MINAGRO/ORA are coordinated with the province to finance and fully feature Simple Stations with sensors.

Map 8. Integration of Meteorological Station Networks of the Province of Corrientes.

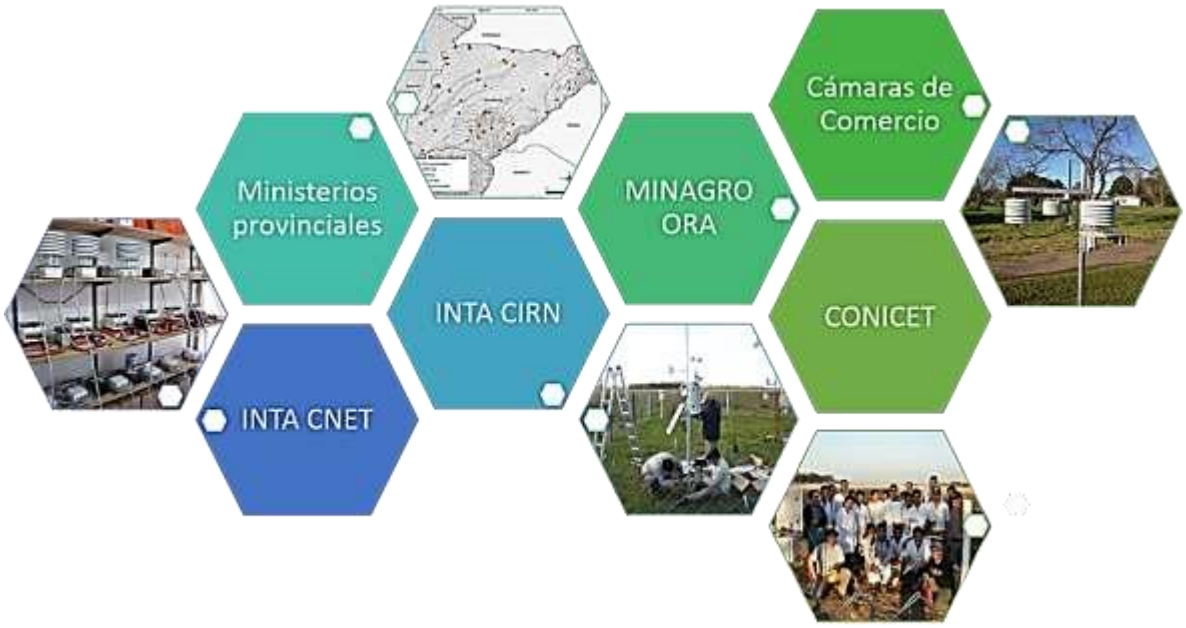


Source: CIRN/INTA

Perhaps the most ambitious intervention within this component's framework, as culmination of all previous activities, may be MINAGRO/ORA's activity (about the creation of soil moisture maps) and INTA/CIRN's activity (generation and analysis of climate data) in an attempt to create a first approach to an Early Warning System at a regional level: a web page that includes all of the information systems existing in the NEA for climate warning data. For this subcomponent (2.2), in first place, progress was made with a GIS tool, a finished product. At present, thanks to the work done by CONICET researchers and INTA computer technicians in Bahía Blanca, forecasts are being prepared with data from station networks.

Given that the goal is that the web page is useful for future users (technicians and producers in land), a workshop was taught in the INTA Regional Center in Chaco in 2016, and another one will be taught in 2017 about "climate products", in which the invited actors of the four provinces propose improvements or new tools according to their needs.

Illustration 6. Articulation of stakeholders in the generation of an EWS (component 2)



Source: Own compilation from documentary sources and interviews.

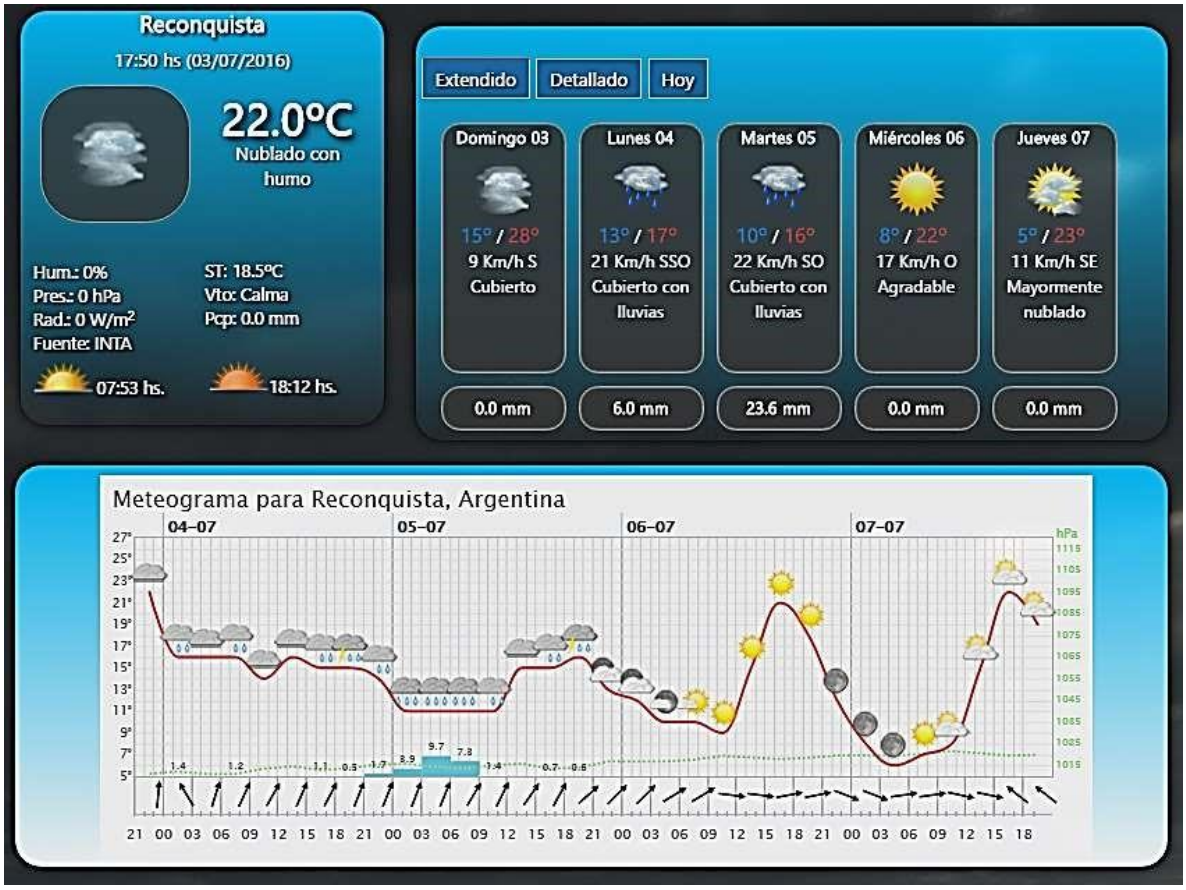
The system will have three components:

- A platform to upload own reports (private access)
- The development of an own climate product (public access)
- Links to products of other institutions

At the present, the platform is running a test server, until the server acquired by the project is installed. The web page is adapted in order to have a good vision through mobile phones. In addition to the daily forecast, it includes a “Predictive Models” section, where the products developed for the different meteorological variables are available. New products will follow as well as the locations of water works of component 1.

It will be essential to define, before the imminent project’s completion, which entities will be responsible for hosting and managing the system once finished, working on any improvement, and which institution will be able to have access to the system.

Illustration 7. NEA display web platform. Climate products for the decision-making process.



Source: INTA/CIRN

Evolution of expected positive effects of intervention in the creation of an EWS (component 2)

Two provinces involved in the project, Corrientes and Chaco, and business associations, altogether with INTA/CIRN and MINAGRO/ORA, aim to increase the density of INTA meteorological stations network - by creating new ones, improving the existing ones, and incorporating those of other provinces - in order to strengthen the hydro-meteorological and agricultural production monitoring systems for a better decision making process and to create a regional SAT. The first interference is nearly over; the second one is still ongoing, with SAT already installed online that needs development and improvement.

The budget to accomplish this represents 20% and an acceptable average degree of compliance (50% in relation with the final goal). The subcomponent 2.1 was accomplished in 56%, whilst 2.2 in 44% due to the fact that its accomplishment depends mostly on the progress of the previous subcomponent, though an impulse on the implement measures of the agreements with the provinces should be done.

6.2.4. Effectiveness of intervention on capacity building (component 3)

This component was primarily led by MAyDS but the agreement made for that purpose did not prove successful. A coordinator associated to INTA Extension is currently leading it. As it was previously explained, it was not a right decision to take the trainings as a separated component as it brought about difficulties on its execution. Mainly, not solely, because a great deal of these trainings are linked to activities of other components. This raised confusion on who was in charge of accomplishing them; in the end, the coordinators of other components took over the training linked to their own, though in some cases the coordinator of component 3 granted methodological attendance. Furthermore, some transversal training was taken up by that coordination.

In spite of this, all activities of component 2 generally show a remarkable degree of progress over the originally established goals. Subcomponent 3.1. for training to technicians have an efficiency of 97% and training to producers, 17%. This makes an average of 57%, which in October 2016 implies 81% of the goal stipulated for that date. Subcomponent 3.2. have met its objectives regarding the number of institutions to train, exceeded 5 to 8 planned publications and 60% of the planned meetings. On average, the component shows an efficiency of 87% over the projected final goal. The only major deficit is training for producers.

Table 7. Course of action of risk transfer: indicators, goals and progress by activity as of October 2016

Type of indicator	Indicator	Baseline	Progress from the beginning of the project	Goal at the end of the project	Progress from the beginning %
Product 3.1. Development of the training blocks and communication for the management and risk transfer addressed to governmental officials and small agricultural producers.	% of staff and producers trained to implement measures against any climate impacts and to mitigate them (separated by gender.)	No training activity performed for experts (200 technical experts).	97%	80%	**97%**
		No training activity performed for the beneficiaries (4,000 beneficiaries).	17%	80%	**17%**
Product 3.2. Training for local and provincial governments for the hydrometeorological management and control, climate information analysis, methodological tools use and adaptation frames development.	# of institutions trained for the use of early warning systems and associated tools.	Zero	5	5	**100%**
Activity 3.2.5. Diffusion of learnt lessons.	# publishing and meetings performed for spreading the project	3 publishing during the project	5	8	**160%**
		One meeting per year	5	3	**60%**

Source: Annual Report 2016 to AF

In 2016, a new proactive strategy was carried out, and RPTA trainers were requested a record of the necessary trainings with topics including water, climate changes, agro ecology, agro forestry, and gender. These trainings are planned resembling the demand, in order to ensure the interest in the region and its involvement in the organization. Furthermore, a consultant was included to accompany the producers, during subcomponent 1.1 activities, with training in climate change, which gives sense and context to the works performed in their land.

Evolution of expected positive effects of the capacity-building intervention (component 3)

It was expected that MAyDS lead the course of action, but currently it is led by a coordinator linked to INTA. Placing trainings as an aside component raises confusion due to the fact that many of them are linked to activities of other components. Finally, some training was performed by component 3 and others were developed by other actors. Nevertheless, according to its indicators, the activities show significant progress, except with producers' trainings. In subcomponent 3.1, trainings for experts are 97% efficient, while trainings for producers are 17% efficient, that is to say, a 57% in relation to the final goal. Subcomponent 3.2 has met its target in the number of institutions to train, which went from 5 to 8 in prescribed releases, and has accomplished 60% of the fixed meetings. On average, the component is 87% efficient against the final expected goal.

6.3. BENEFIT PER TARGET GROUP: GENDER, YOUTH AND INDIGENOUS PEOPLES.

A key characteristic to this project is that it is possible to identify different target groups according to the different courses of action. Regional intervention gives priority to family producers with less income; through help from the project and the continuing support from INTA Extension, it also generates facilities for the families with low resources to become family producers in the future. Nevertheless, there exist a wide range of recipients since, despite a new working methodology was proposed by the National Coordination of Extension of INTA, each RPTA interpreted it according to the characteristics of its region. While some RPTA work with families with low subsistence rates, others work with consolidated agricultural producers or cattle breeders.

Similar to the risk transference proposal, the intervention in a regional SAT generation focuses mainly in small and medium producers, regional professionals, and decision makers.

Another evident pattern found when referring to work with recipients is that there is a significant difference in effectiveness and legitimacy of the work whenever **working through organizations**. Organizations guarantee more speed in the implementation, replicability in the execution and more legitimacy when selecting the addressees as this are already determined by assembly or collective meetings.

Regarding **women's engagement** in the activities in general, the measurement of the indicators show that few families are led by women (10%) or by young people (25%) – it is clear that the impact of the project is not significant at all for the latter. Nevertheless, it is important, mainly for subcomponent 1.1, to bear in mind the following: activities of water transporting are especially performed by women and children. It has been seen that each family dedicates around 4 or 5 hours per day to these activities – 65 days per year; that is to say, the women from these 721 families were benefited with this

subcomponent, as they are free from a work that takes them more than 2 months a year. This is perhaps, in terms of gender, the main impact of the project: women can now dedicate those 1586 hours per year to other activities rather than water transporting. This may undoubtedly give them the possibility of paying more attention to school or health support of their kids, to the agricultural production quality, or even to their own health.

Furthermore, there exist some activities specially designed to work with specific groups of addressees, such as activity 1.3.1. for the work with the **indigenous peoples**, which has a low rate of execution.

Table 8. Planned activities with indigenous peoples

Type of indicator	Indicator	Baseline	Progress from the beginning of the project	Goal at the end of the project	Progress from the beginning %
Activity 1.3.1. Assistance to indigenous people in the construction of fruit and vegetable gardens with irrigation and small animal husbandry.	Number of indigenous families that receive technical assistance.	15 families with fruit and vegetable gardens with irrigation and small animal husbandry.	Total: 4 families Led by women: 2 Led by youths: 1	82	**5%**

Source: Annual Report 2016 to AF

However, main activities with indigenous people are developed in subcomponent 1.1, provided that this population is highly vulnerable and has little access to water, mainly in Chaco and Corrientes.

Illustration 8. Activities with indigenous peoples in subcomponent 1.1

Source: RPTA CR Chaco/Formosa Coordinators and Project Monitoring

Although indicators have not been differentiated, there is disaggregated information in work datasheets that allows identifying to date works done by these communities and estimate that the works benefit 200 families and most of the students (380 in total) from the schools where action was taken; this represents a significant impact of the project among this group.

Table 9. Activities of Component 1 performed in indigenous communities.

Province	Location	Drills	Roofs, tanks and cisterns	Community dams	Crop protection structures	Families	School Students
Chaco	Machagai			2		150	
Chaco	Impenetrable		6	1		21	
Chaco	Buena Vt , 7 árboles (Depto S. Martin)		1				380
Chaco	Gral. J.S. Martin S. (Depto. Martín)		1			10	
Corrientes	Loreto, Itá Ibaté (Depto General Paz)	15			5	15	

Source: Information provided by the Management Control Area of UCAR

Differentiated benefit for women, youths and native peoples.
This Project is addressed either to families in survival situations and to small producers in commercial activity, depending on the subcomponent and the RPTA. The work has been favored when accomplished through social organizations (cooperatives, etc.), though this is not very frequent. The percentage of families helped by the project that are led by women is low (10%),

and by youths is moderate (25%). Nonetheless, the impact of subcomponent 1.1 is very high; activities of water transporting are carried out by women and youths, dedicating around 4/5 hours per day; so women from the 721 families benefited with this subcomponent were exempt from a work that takes them more than 2 months a year. Regarding native peoples, activity 1.3.1 shows low improvement (5%), but many activities with native peoples are developed in subcomponent 1.1, given that the population is highly vulnerable and has little access to water, mainly in Chaco and Corrientes. There are 576 families from native peoples that were benefited by component 1 so far, which is 41% of the families benefited by the project so far.

7. PROJECT EFFICIENCY

The criterion for efficiency often relates the means to the goals: it represents how supplies such as resources, materials, equipment, services, money and time, have been turned into results (OECD, 2002). A project is successful if it fulfills its purposes with the lowest costs. For that reason, on the one hand, it is important to determine cost, quantity, quality, and time that were needed for achieving the works. On the other hand, it is also necessary to make an analysis of the quality of execution of the project afterwards - which, in this case, has two different roles: implementing and achieving. The analysis will focus on the dynamic between stakeholders.

7.1. EFFICIENCY IN BUDGET AND TIME

The total amount of the budget allocated to the project is US$ 5,64 billion totally provided by AF[35]. Until now, this budget has not suffered any variations, updates or internal adjustments, although a reallocation request is still ongoing. Most of the expenses are due to territory procedures or in favor of producers, with very little indirect expenses or institutional expenses. This results in a financial leverage and efficient use of the resources.

The original distribution of the resources for the three LFM components is the following: i) C1 to increase resilience of small-scale producers, 63% of total budget –from which 28% is to improve the use, the ways to obtain and store water; 23% is to management and risk transfer; and 12% to agricultural management- ii) C2 to strengthen monitoring systems – 25% of total budget from which 12% is for Integration and Expansion of networks, and 13% for EWS development - and iii) C3 Increasing the capacity of decision-making through trainings – 8% of total budget from which 5% goes to insurance trainings, and 3% to climate records trainings. 5% of the total budget goes to management expenses (evaluations and external audits).

[35] According to the interviews, UCAR has records of all the contribution necessaries for carrying out the Project, apart from the contributions of AF.

Table 10. Original budget by component and outcome, by year and total

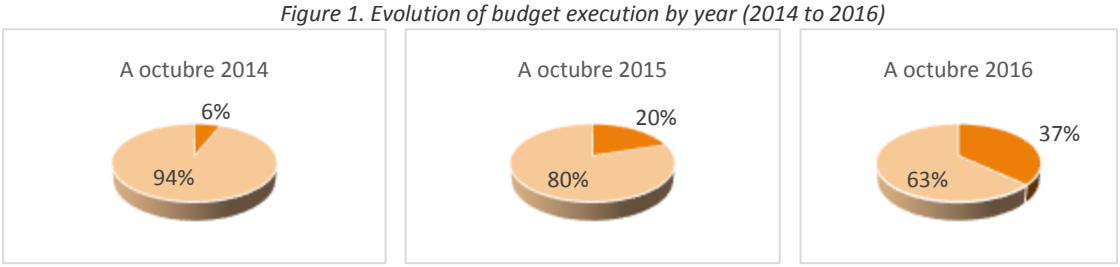
Ref.		Budget 2013	Budget 2014	Budget 2015	Total budget	% over total
Output 1.1	Improvements in water use, collection, harvesting and storage efficiency	802.757	476.473	258.941	**1.538.171**	28%
Output 1.2	Risk management and transfer system	448.942	390.000	421.200	**1.260.142**	23%
Output 1.3	Practices of optimization of agricultural, livestock and forestry productive management	316.152	196.667	133.049	**701.068**	12%
Component 1	**Increase the resilience of small-scale agriculture producers**	**1.567.851**	**1.063.140**	**813.190**	**3.499.381**	**63%**
Output 2.1	Integration and extension of agro-hydro-meteorological networks	308.500	266.500	78.500	**653.500**	12
Output 2.2	Early Warning System for Climate Risk Assessment and Management	180.038	369.207	201.625	**750.870**	13
Component 2	**Strengthen monitoring systems Hydro-meteorological and agro-productive**	488.538	635.707	280.125	**1.404.370**	**25%**
Output 3.1	Training modules and communication on risk management and transfer	153.792	84.508	33.200	**271.500**	5%
Output 3.2	Training of municipal and provincial government units for the management and Hydrometeorological monitoring, etc.	21.625	98.125	65.000	**184.750**	3%
Component 3	**Increase in institutional capacity for decision-making and management of measures**	175.417	182.633	98.200	**456.250**	**8%**
NIE					**280.000**	**5%**
TOTAL					**5.640.000**	**100%**

Source: Annual reports to AF and project proposal

Since October 2013, the initiation date of the Project execution, **38% of the funding granted has been used (USD 2,090,546), remaining 62% (USD 3,549,452) to be used between November 2016 and March 2018**. There were two main circumstances that delayed the execution of the project. The first one was the administrative procedure in MINAGRO to formalize ORA's participation as

executing entity, which delayed its admission for about a year. Furthermore, during 2015 the project did not have access to any funds due to an mistake in which they were allocated in the National Budget Office (*Oficina Nacional de Presupuesto*), so the funds were charged to the technical agencies, INTA and MINAGRO. Despite being able to obtain small funds by other means, that mistake brought by low progress in the execution.

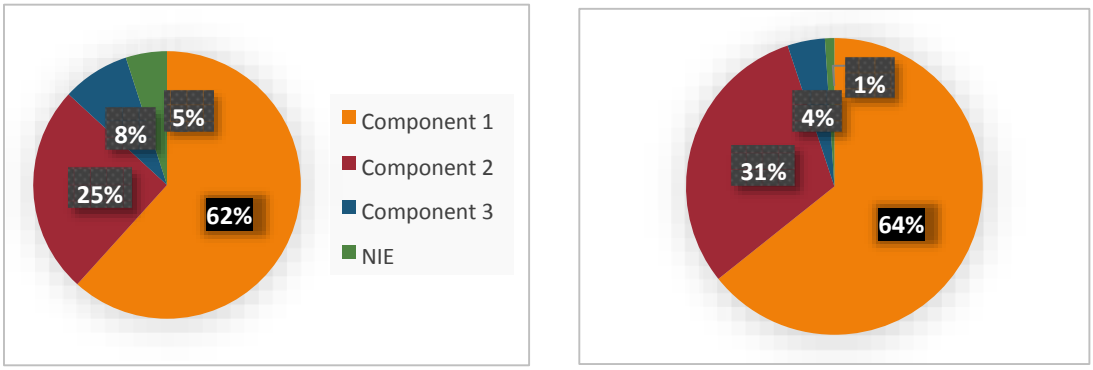
Figure 1. Evolution of budget execution by year (2014 to 2016)



7.1.1. Efficiency by Component

The budget of the Project is focused on component 1, which represents two thirds of the expected expenses. This means that the project turns out to be strong when working with producers. Component 3 represents less than 10% - that is why it is not relevant to consider this one as an independent component.

Figure 2. Resource allocation by component in % of original total budget v. cost by component in % of total cost, as of October 2016



Source: Annual Reports to AF

The previous figure shows the allotment of each component over the total budget and total cost as of October 2016. It is seen that component 1 has a similar execution to its allotment; component 2 makes some progress; and component 3 represents a relative low cost.

If we analyze the budget execution and the budget given to each component, it is evident that component 1 and 3 are behind their target cost (A 62% is left and 81% respectively), and component 2 is within the expected (54%).

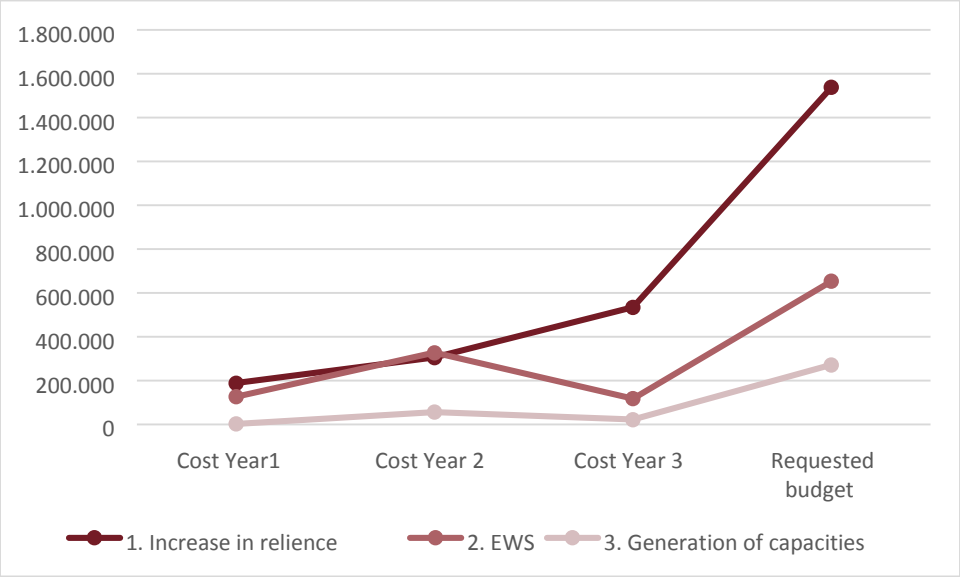
Table 11. Cost Years 1+2+3 and remainder by component

COMPONENT	Cost A1	Cost A1/Total Cost	Cost A2	Cost A2/Total Cost	Cost A1+A2	Cost A3	Cost A3/Total Cost	Cost A1+A2+A3	Remainder	Remainder /Total Cost
1. Increase in resilience	188.588	5%	397.931	11%	586.520	747.247	21%	1.333.767	2.165.614	62%
2. EWS	126.160	9%	347.334	25%	473.494	165.805	12%	639.299	765.071	54%
3. Training	2.163	0%	56.523	12%	58.686	29.137	6%	87.823	368.427	81%
TOTAL	634.170	6%	1.611.119	15%	1.118.700	1.906.148	17%	4.151.438	6.848.564	62%

Source: Annual Reports to AF

The following figure shows the pace of the annual cost by component up to now. The last section of each line ("Cost Year 3" until "Requested budget") also shows the remaining cost, exhibiting a necessity for an acceleration of the pace until the end of the project in all of them.

Figure 3. Pace of cumulative cost and remainder by component .



Source: Annual reports to the AF

Global effectiveness and effectiveness by component

The original approach of concentrating resources in the capitalization of the territory (works, information, training, etc.), with very little indirect or institutional costs, implies great efficiency in the use of resources. However, the pace of execution of activities has been moderate so far. In the three years of the project, a 38% of the financing granted (USD 2,090,549) has been executed, leaving a remainder of 62% (USD 3,549,452) to be executed until March 2018. Two circumstances gave rise to delays: one year of delay in signing the agreement with the MINAGRO / ORA and the mistake of imputation in the National Budget of the funds for 2015 that were inaccessible.

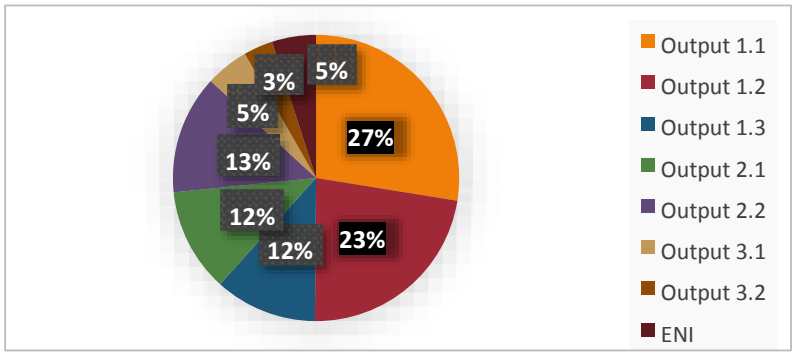
Component 1 and 3 are behind their spending targets, with 62% and 81% respectively, component 2 has achieved satisfactory execution (54%). There is evidence of significant acceleration in the pace of implementation to the end of the project in all components.

7.1.2. Efficiency by Subcomponent

At a more detailed level of analysis, the specific allotment of the subcomponents in the original budget can be organized into three groups: first, 1.1 and 1.2 with a quarter of the budget each, together accounting for just over half of the total budget; secondly, subcomponents 1.3, 2.1 and 2.2 with slightly more than 10% each, accounting for one third of the total; and in the third place, the two training subcomponents with about 5% of the total each.

Taking into account that INTA/CNTE is in charge of 1.1 and 1.3 (41%) and INTA/CIRN is in charge of 2.1 (12%) charge INTA/CNTE, INTA has almost exclusive responsibility for the execution of 53% of cost. In addition, it has shared responsibility for the development of 2.2 (14%) along with MINAGRO / ORA and 3.2 (4%) for training. INTA is, therefore, the stakeholder with greater execution load of the Project. MINAGRO/ORA is responsible for the exclusive execution of subcomponent 1.2 (24%), along with INTA/CIRN (2.2%) and 5% in training.

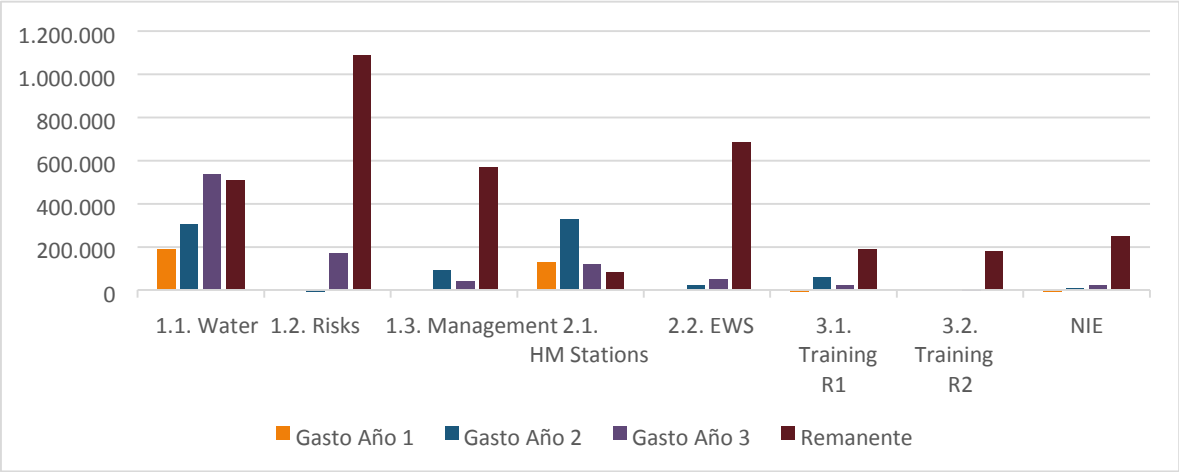
Figure 4. Resource allocation by subcomponent (output), in % of total original budget



Source: Annual Reports to AF

The analysis of budget execution by subcomponent presents a more complex scenario: 1.1 of works of access to water and 2.1 of assembly, placement and integration of hydro-meteorological stations have progressed strongly, with a cost of 67% and 87% respectively. Both of them have achieved optimal execution thresholds, with the rest of subcomponents not reaching a moderate level of costs.

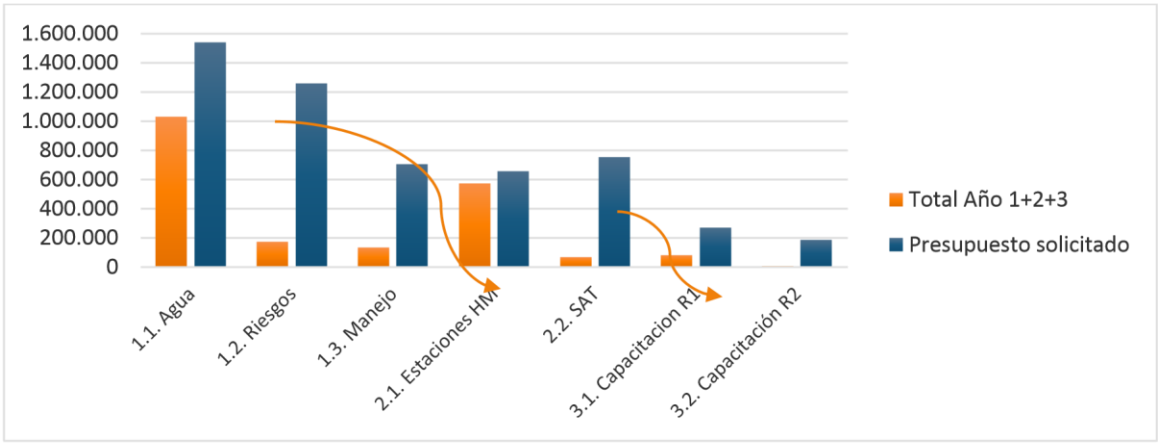
Figure 5. Cost magnitude: budget execution by year and subcomponent vs remainder (USD)



Source: Annual Reports to AF

However, the previous figure should be interpreted taking into account some temporary links. As expected from the formulation, subcomponent 2.2 can only be carried out when hydro-meteorological stations are assembled, installed and in operation. That is precisely the point where they are. The conditions are given, therefore, to progress in what is left of time 2.2. Similarly, although this does not appear to be the case in the project design, subcomponent 1.3 is awaiting the completion of several water access works (1.1): this has been decided by INTA technicians in the field who have assumed the priorities that producers indicated in this regard. The trainings should hold increase, from now on, their pace of execution.

Figure 6. Cumulative cost: Accrued budget execution by subcomponent vs budget (USD)



Fuente: Informes anuales al FdA

Since the conditions required for progress in sub-components 1.3 and 2.2 are already accomplished, they should begin to move forward with speed from now on. The same can be said for component 3.

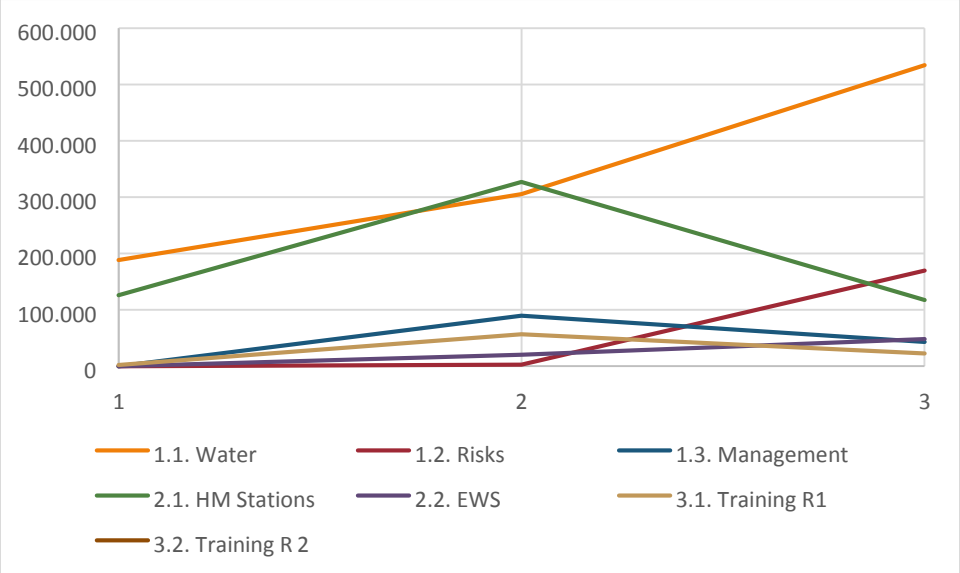
Table 12. Cost Years 1+2+3 and remainder vs. Budget (USD)

Component	Result	Cost Year 1	Cost Year 1/ Total Cost	Cost Year 2	Cost Year 2/ Total Cost	Cost Year 3	Cost Year 3/ Total Cost	Total Year 1+2+3 (USD)	Remainder	Remainder / Total Cost	Budget
1. Increase in resilience	1.1. Water	188.588	12%	305.352	20%	534.667	35%	1.028.607	509.564	33%	1.538.171
	1.2. Risks	0	0%	2.804	0%	169.752	13%	172.556	1.087.586	86%	1.260.142
	1.3. Management	0	0%	89.775	13%	42.828	6%	132.603	568.465	81%	701.068
2. EWS	2.1.HM Stations	126.160	19%	327.212	50%	117.565	18%	570.938	82.562	13%	653.500
	2.2. EWS	0	0%	20.121	3%	48.240	6%	68.361	682.509	91%	750.870
3. Capacity building.	3.1. Training R1	2.163	1%	56.523	21%	22.355	8%	81.041	190.459	70%	271.500
	3.2. Training R2	0	0%		0%	6.782	4%	6.782	177.968	96%	184.750
	NIE	347	0%	7.544	3%	21.770	8%	29.661	250.339	89%	280.000
	TOTAL	**317.259**	6%	**809.331**	14%	**963.959**	17%	**2.090.549**	**3.549.452**	63%	**5.640.001**

Source: Annual Reports to AF

As a result, apart from the significant progress achieved under subcomponents 1.1 and 2.1, the project has not reached implementation until practically 2016. In the remaining 17 months, a major implementation effort must be carried out to avoid significant activity blocks from being left behind.

Figure 2. Cost pace: budget execution by year and outcome (USD)



Source: Annual Reports to AF

Efficiency by subcomponent

Subcomponents 1.1 of works for access to water and 2.1 of assembly, placement and integration of hydro meteorological stations progressed strongly, with a cost of 67 and 87% respectively. The remaining subcomponents do not achieve a moderate cost level: 1.2. Insurance 14%, 1.3. Management 19%, 2.2. SAT 9%, Training for subcomponent 1, 30% and for subcomponent 2, 4%. It is logical that 1.3 and 2.2 are delayed because their execution depends on the completion of previous activities. In the remaining 17 months of implementation, a major execution effort should be made.

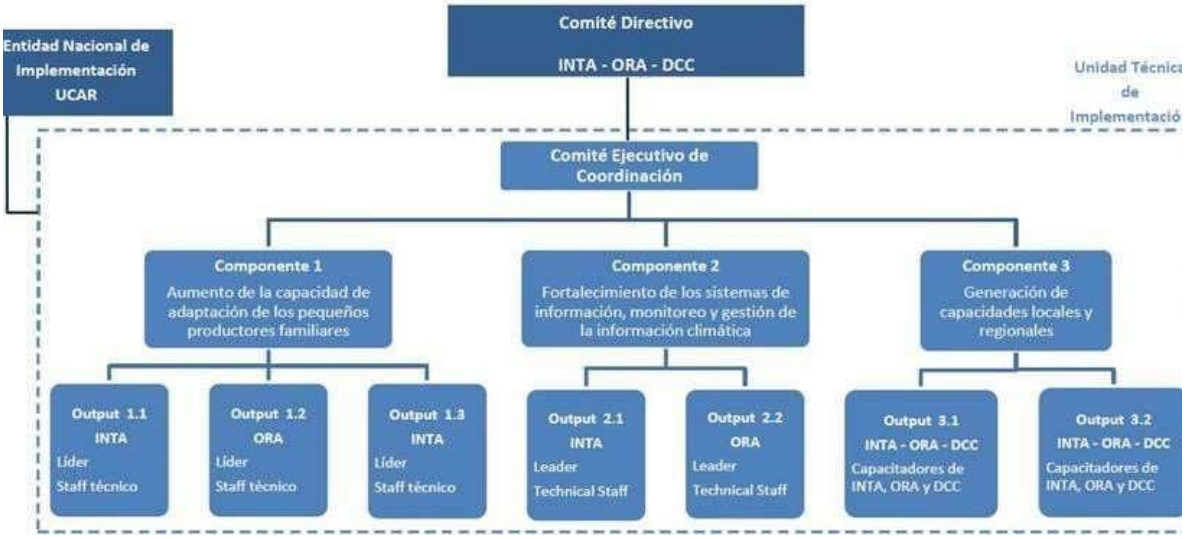
7.2. ANALYSIS OF DYNAMICS AMONG STAKEHOLDERS OF IMPLEMENTATION AND EXECUTION

The Project features several organizational complexities that are both source of wealth and difficulty. These complexities unfold on different levels and between different groups of actors. There are three main circumstances that cause this organizational complexity:

- **Wide constellation of technical stakeholders inside and outside the project:** The dynamics of execution of the activities between the main technical actors (INTA / CIRN, INTA / CNET, MINAGRO / ORA and training coordination) require cross-institutional and coordinated work in almost all subcomponents. Each of the stakeholders that lead the subcomponents has to join other organizations at a territorial, technical and political level, in order to achieve the proposed objectives.
- **New role of UCAR as NIE for the AF:** The Project is the first that UCAR implements after being accredited in its role of National Implementing Entity (NIE) with the AF.
- **Shared administrative management:** The dynamics of administrative execution require the agreement of two entities with different rules and processes: UCAR and *Fundación Argentina*, which in turn must coordinate with INTA and ORA.

The first of these circumstances can be seen in the project flow chart (below): each of the subcomponents has a leading organization that, but this does not exclude the participation of other actors in the project, mainly in outputs 2.2, 3.1 and 3.2, whose objectives are not fulfilled without the articulation of several of them. Moreover, as described in the previous point, each line of action is executed through a constellation of additional stakeholders that include the participation of INTI, universities and municipalities at a territorial level, such as provincial ministries and insurance companies for risk transfer tools, and chambers of commerce and provinces for the consolidation of data networks. In addition, all of them should be articulated with the coordination of component 3 for the development of training.

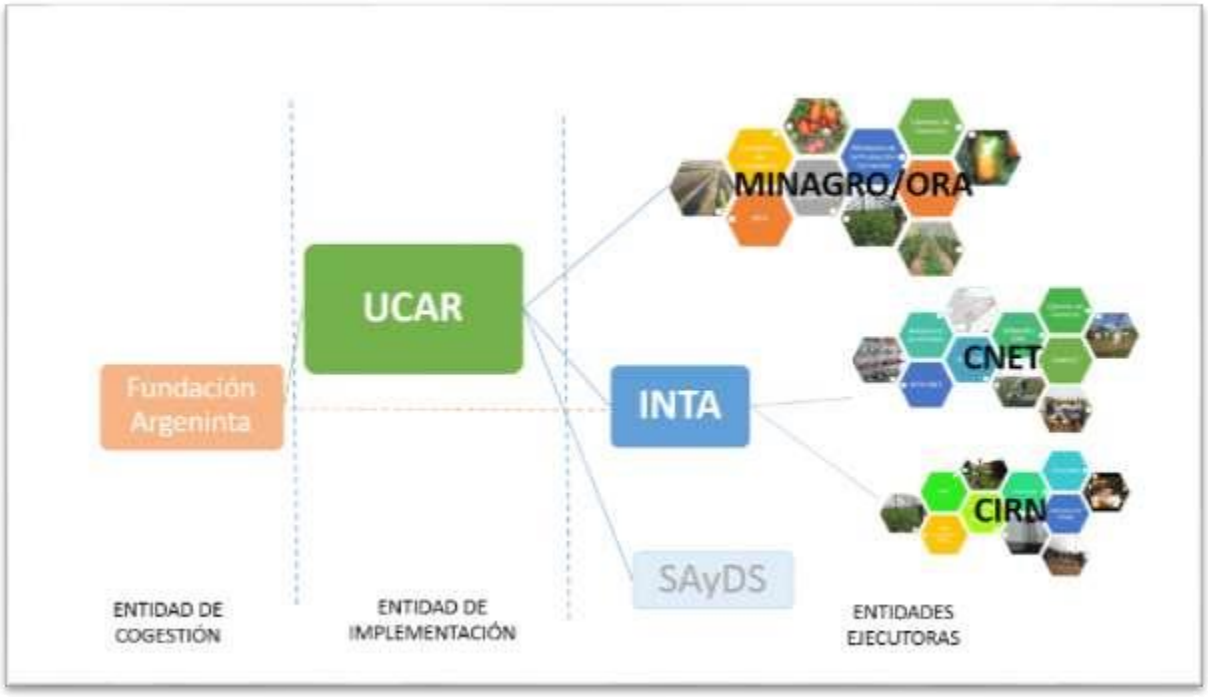
Illustration 9. Project Organizational Chart



Source: Project design document

This design that articulate actors is interesting and allows to accomplish certain goals that otherwise would be impossible to achieve. It also ensures learning processes, allowing innovation boundaries to be expanded. Finally, it ensures the institutional embedding of the activities and, thus, sustainability. However, this great complexity slows down the operation of the intervention and makes it particularly necessary to have an actor that centralizes execution, maintains the helm of the objectives, maintains the rhythm and articulates all the participants.

Illustration 10. Constellation of stakeholders according to executed and effective agreements



Nevertheless, the Project does not count with centralized management, but three different executing entities (INTA, ORA and MAyDS[36]). UAS and UCAR are not formally responsible for the execution of the project; they work in accordance with their role as NIE. The main stage of coordination between technical executors and the NIE is the Executive Coordination Committee (*Comité Ejecutivo de Coordinación),* whose function is to share the updates of the progress in the project execution. This Committee holds a monthly/bimonthly/quarterly meeting for the coordination and monitoring of the project, where representatives of UCAR (UAS and Management Control) and executing entities (INTA/CIRN, INTA/CNET, training coordination and ORA[37]) are present. These meetings have been important for the progress of the execution but, since there is no centralized management, the commitments that have been made there should have been formalized and mechanisms that ensure their fulfillment should have been activated.

Therefore, this "blurry center" of management generated a gray area with competences that were not clearly assigned or were assigned to a group of people with a difficult or slow coordination. As time went by, this situation became not entirely suitable to ensure the application of this complex process. In order to solve this problem, the UAS incorporated the application of new tasks to the previous role it had already assumed (focused on supervision)[38]. The NIE's ambiguous role assigned in the conventions[39], together with its ample experience in international project management made it possible to assume this new role from a both legal and substantial perspective. Besides, this role has a financial support since the UCAR receives a 5% of the project funds to ensure its execution.

[36] INTA signed the Convention on Execution with UCAR on October 4, 2013. The ORA agreed via MINAGRO on October 14, 2014 to participate as executing entity in the project. The MDyAS also signed a Convention on Execution with UCAR on 30 October 2013. According to it, the Secretariat is an executing entity through its Climate Change Office (DCC) for some activities of component 3. However, in practice, this articulation has not been fulfilled so far. The MDyAS has followed it closely and has acted as an advisory body to the project given its role of "Designated Authority" for the AF.

[37] According to the convention, the attendance of members of SAyDS was also expected to the Executive Committee.

[38] According to the conventions, UCAR: will execute the roles embedded to the National Implementing Entity (NIE) according to the fiduciary and operative standards required at the moment of its certification. UCAR:

a) Will be responsible for the achievement of the objectives and components of the project as well as the efficient and effective assignation and distribution of the resources.

b) Will have the technical and administrative responsibility for the application of the Adaptation Fund resources in order to reach the expected results and products.

c) Will be responsible for the resources and its proper assignation on time and for the coordination of all the parties involved in the execution.

d) Will develop the monitoring and assessment activities and the on-field actions' monitoring, coordinating, supervising and supporting the activities of the Implementation Technical Unit.

e) Will be responsible for ensuring the project generates the results detailed on the Project Document under the required standards of quality and within the specified limitations on time and costs. It will be guaranteed: Appropriate assignation of resources. Transparency. Coherence between the objectives and actions of the project. Results disclosure.

f) The UCAR will be entirely responsible for the effective implementation of the project, apart from the obligations above mentioned; it will have the operative responsibility of the execution of the project.

[39] The above mentioned f) clause of the Convention UCAR-INTA refers to the "operative responsibility of the execution". Besides, the convention UCAR-AF on its clause 4.01. states that the "The Implementing Entity will be in charge of the global management of the Project, including all the financial, controlling and informative responsibilities."

This project has resulted expensive due to the fact that the UAS, the unit of reference to the project management, is a technical area of the UCAR which has never been in charge of the project execution, since its main responsibility was to analyze and cross the matters of the environment, genre, youth and native peoples in all UCAR's projects. The team, which is especially devoted to the UAS's project, is very small: formed by two full time technicians (one of them has been working since 2014), together with a coordinator and an administrative assistant who are also responsible for other tasks. Nevertheless, the execution was possible thanks to UCAR Management Control Area's proactive and efficient support from the very beginning.

The coincidence of the progressive improvement of the management and the gradual involvement of the UAS is made evident in: 1) the cumulative construction of the monitoring of the project, originally accepted only by the UCAR Management Control Area, later enlarged with an external consultant for the components 1.1 and 1.3, which gradually improved its skills; 2) the inclusion of the Planning Workshops in 2016 with the objective of identifying needs, explaining the works, agreeing on schedules and arranging with the necessary organizations; 3) the gradual improvement of the meetings of the Executive Coordination Committee, which had originally fewer meetings and incorporated less members.

The lack of a baseline is one example of how difficult it is to execute some management agreements. The project could have performed a "vulnerability diagnosis" to help identify beneficiaries and to clearly establish the necessities that will be covered as the activity n°1, as it is usual in this kind of interventions and projects managed by UCAR. The UAS insisted on performing it, but finally it was not done. In the case of INTA Extension (CNTE), the creation of the RENAF was in progress[40] (creating a baseline would have meant duplicating the task) and all its beneficiaries were its traditional objective population, therefore at that time it was not considerable to do it. In the case of the ORA, the appraisal could have been an excellent moment to discuss the situation with the producers, but this opportunity was not taken in the end. The difficulty of identifying the producers who were to benefit from the project was seen as a problem for the coordinators of the agricultural insurance line of action and training. Even, in ORA's case, this difficulty had an impact on the insurance modality (it was though on one which could cover a small area with a big concentration of producers, in order to reduce the cost of identification). Consequently, the basic information of the project is incomplete, thus obstructing the monitoring and evaluation.

The verification of these facts supports the idea that in the end, the UAS in particular and the UCAR in general, went further in their original role of Entity of Implementation and have assumed the typical tasks of an Entity of Execution, since this function was partly vacant or needed to be improved due to the project's complexity. This situation has been undoubtedly positive for the attained objectives. On the other hand, the funding percentage allocated to UCAR (5%) has been used in a very low amount (11%). It could be useful to take advantage of all the available funds to

[40] National Registry of Family Farming (RENAF). See: www.agroindustria.gob.ar/sitio/areas/d_registros_y_monotributo_agropecuario/renaf/index.php [42] INTA has recently incorporated two management profiles in line with this objective.

improve the management function in the following months until the end of the project in order to reach higher levels of efficiency and impact[42]. It is necessary that the UCAR provide the essential equipment for this.

These are the reasons why the management of this project has been a process of constant learning with difficult moments of trial and error along the time, after which the UAS could improve the tasks.

However, it is complicated to know the relative importance of the different circumstances that affect the execution. The delays in signing the conventions and the allocation errors in the national budget had altogether a clearly negative effect. The lack of a centralized management is another great difficulty, but the greatest one is the project's own complexity. This type of execution is so locally concentrated that the activities are developed only in a local scale, which implies that the suppliers who participate in the acquisitions are of a smaller scale and find it hard to access the territory, apart from not being familiar with public funding. This situation demands more time and a greater management as well as a more proactive attitude from the administrative teams.

Furthermore, administrative management has a slower development since it depends on the different departments of UCAR, (Human Resources, Purchases, Monitoring, Accountancy, etc.). As well as it occurs with any other project, it is necessary to take into account the partnership with *Fundación Argeninta*. The fact that UCAR's procedures are verified by the main international organisms (IDB, WB, CAF, etc.) guarantees a high quality management. At the same time, this delays and obstructs the requisites even more than usual because the common projects of UCAR have bigger budgets and a higher complexity than AF's project. Besides, this situation also leads to the duplication of some administrative functions, such as the creation of tender documents where both the Purchase Area of UCAR and the Legal Department of *Fundación Argeninta* participate.

After having stated the difficulties it is important to highlight the attained objectives up to now, which were possible through the firm and evident commitment of all the involved actors, from the territory to the decision-making centers and from the administrative stages to technicians and researchers. Furthermore, the people and the institutions that are part of the implementation of the project joined as a team, highly motivated by the objectives, making it possible to solve all the difficulties.

Dynamics of the implementing and executing stakeholders
The project has many organizational difficulties: a great variety of technical stakeholders in and out of the project; a new and ambiguous role of the UCAR as NIE; shared administrative management (UCAR/Fundación Argeninta); profusion, territorial spread and small scale of suppliers. This inter-acting design is interesting and allows to obtain objectives that otherwise would have been impossible to attain; it ensures mutual learning and the institutional establishment of the activities. However, this design obstructs the efficiency of the intervention, thus requiring an actor to concentrate, steer the objectives and guide the participants. The project does not have a classic

concentrated management unity: the executors are INTA, ORA and SAyDS. UAS/UCAR originally developed guidance competences according to its NIE role but the necessity to overcome the difficulties of such a complex project with so many actors, had led the organization to assume the typical tasks of an Executing Entity, due to the fact that the function was partially vacant or needed to be strengthen. This situation has been undoubtedly positive for the achieved goals.

7.3. BEST PRACTICES AND LESSONS LEARNED IN IMPLEMENTATION AND EXECUTION

REGARDING TECHNICAL EXECUTION (by subcomponent)

1.1. Some technical teams decided to train on Water Specialization in order to be able to place the topic on RPTA based on a scientific support. This has given priority to the matter in the extension department of INTA.

1.1 and 1.3. There is an evident difference in the attitude between the female coordinators and technicians and their male coworkers in the RPTA. Although the technicians and coordinators in general have taken a proactive posture, this is more common among women, who are more prone to partnership and are more creative and more capable to reach the objectives through innovative methods.

1.1 and 1.3. The closeness of the familiar production to the cropped territories that follow technological packages with agrochemicals poses a big threat not only to the production itself, but also to the health of the producers, their family and their livestock. An example of this is the contamination by glyphosate found in the collected rainwater by beneficiaries of the works and the loss of crops after nearby spraying. This had led to provide additional solutions, such as the ongoing installation of filters, but it also highlights the need to raise awareness of this problem, given its current invisibility.

1.2. The negotiation pool among ORA, the Ministries of Local Production and the insurance companies had a satisfactory workout, with relevant achievements and agreements. The design of the policy was not clear in the beginning: it was established as a collective production and nobody can take credit from it singularly; everyone had their own background and they contributed with it. There were many challenges to solve that were only possible to achieve by a group. There was a high acceptance of the policy among the reinsurance companies, which highlights the attained technical advances.

1.2. It was a great decision to have carried out a first pilot test of insurance policy at a small scale, since it had a great impact on the operation of the involved insurance companies, which are organized on the basis of the administrative, banking and communicative capacities of medium and big producers.

1.2. For the time being, it is not possible to disregard the complementation of the State on a policy for small producers. Even if the State assumes the cost of the premium or part of it, it results difficult to reach the ideal coverage. The development of these insurances constitutes a long

process which requires caution and patience, since companies' reputation is at stake and family producers are still reticent to assume the partial cost of the climate risks.

2.2 The interaction ORA/CIRN was complex; nevertheless, it had advantages for both institutions. It should be strengthened and delved into it since both institutions' objectives are supplementary.

3. Trainings related to works, the insurances or to the consolidation of data networks should have been included in the corresponding thematic components, which should be considered from the execution.

ABOUT MANAGEMENT

Monitoring visits on the field. One of the implemented actions with the view to improve the results of the project was the beginning of the in situ visits of the coordinators of the project (INTA and UCAR). This action allowed the collection of sensitive information to improve the inter-institutional management of the project; it generated information about the difficulties and delays, besides verifying what was done and also obtaining information on gender issues and possession of the project by the beneficiaries. This activity should be maintained and strengthened, particularly on what refers to the insurance of the quality standards on the finishing of the works.

Planning meetings and goals revision. The improvement of these meetings between the executors and the entity of implementation was a key to analyze the advance of the execution and the need to redirect actions to meet the set deadline and reach the expected results.

Annual planning of acquisitions with all coordinators of RPTA. This achievement generated consolidated information and it was strategic for the creation of equipment purchase tenders, to reduce the administrative schedules for the programmed work execution.

8. PROJECT SUSTAINABILITY

It is very soon to try to identify the impacts at the stage of a mid-term assessment. The impact of an intervention is the result of casual complex logics and it is difficult to examine when the project is still ongoing. Generally, the impact in the long term can only be evaluated after the project has concluded. On the other hand, the chosen indicator for the GO does not measure the impact ("number of vulnerable families to the negative effects of variability and climate change"), but the activities' coverage. It should have been included in the GO an indicator that captures the possible dimensions of the resilience of small producers towards the climate change. The lack of clarity in the LFM about the components' indicators and the expected measure of the subcomponents' indicators to the end of the project complicate the current calculation of the impacts. Finally, the planned method for the present evaluation is not adaptable to this end, since it allows neither to isolate external variables nor to identify autonomous casualties. Therefore, in order to identify impacts it is necessary to perform an assessment ad hoc at the end of the project.

That is why the impacts' estimate detailed below is a preliminary task. It is based on findings that were discovered in a disorganized way during the investigation, related to the unexpected effects or the impacts on a community and the urban policies that should be included in the report. The intention of this is to work as an initial estimation of the project's sustainability. The World Bank understands the term 'sustainability' as "the capacity of a project to maintain an acceptable level of flow of benefits beyond its economic life". From this point of view, we will anticipate if the attained results already imply a permanent achievement or the reach of a kind of flat land. The financial and technological matters, together with the institutional dynamics contribute to this analysis, which will be carried out following the logic of the lines of action previously suggested.

8.1. FINANCIAL, INSTITUTIONAL AND TECHNOLOGICAL SUSTAINABILITY.

By analyzing the characteristic type of intervention of each of the courses of action, we can expect the above-mentioned achievements will show a high sustainability. Regarding the territorial intervention (subcomponents 1.1 and 1.3), it is visible on the following aspects and by the following reasons:

- When it comes to institutions, the type of intervention on the territory is aligned with the work that INTA has been conducting through its RPTA. Although it is certain that INTA has not been involved in water access works, (output 1.1) and does not have a program in charge of that, the project has made this need evident and both the coordinators and technicians identify it as an essential and previous line of action for programs such as Prohuerta or Rural Change. It is almost impossible for producers to make and maintain their agricultural production with no access to drinking water.

- The emphasis on the self-building of works of access to water is the key to their sustainability since the skills they gain would help them to build future wells, cisterns or ceilings in the case they obtain new materials. In fact, at the moment these kinds of works have been done by the qualified producers in other fields.

- As opposed to the works, the improvements in the territorial management of the output 1.3 constitute an activity framed clearly under the traditional task of INTA Extension. In fact, the suggested activities from the subcomponent are very similar to those in the Prohuerta Program (one of the three key programmes of INTA Extension), which has just been encouraged by a budget increase from the government. Therefore, is highly probable that this kind of actions will continue beyond the end of the project.

- Focused on the possibility to both maintain and imitate the technology used, the project turned towards the strengthening of local capacities by adapting the technology to their needs. INTI has long been working on the idea of the access to water for the familiar production. Its proposal is to build wells with concrete instead of bricks, using building molds of easy construction. Their explanation is that this decreases the risks of workers almost to zero because the wall does not fall down, besides it is safer since it has a heavy lid which prevents accidents. In some areas of the province of Chaco, which has a tradition on bricks, there was an opposition to this methodology because it endangers the small producers of the area. In the end, it was possible to discuss with INTI, which accepted the commitment of investigating this new technique, since both methods are convenient depending on the kind of soil (sandy or clay soil).

Illustration 11. Local building of a panel water tank.

Source: INTA CR Chaco/Formosa. RPTA Bermejo

- Furthermore, INTA has been insisting on the Panel Water Tank for rainwater[41]. This technology allows self-building, partnered with the Programme "Labor Trainings" from the Ministry of Labor (thanks to the signed convention from INTA) and provides an eight-month funding to those who receive training for a

[41] Please visit: inta.gob.ar/documentos/paso-a-paso-construccion-de-tecnologias-apropiadas-cisterna-de-placas for more information about the construction of the Plaques Cistern.

profession. Last year there were seven trainings with 140 people. This strategy is still being used to generate local capacities.

- The contribution to the GO is clear, since beneficiary producers and their families notice their growth in their capacity to adapt and their resilience towards the impacts from the global warming and its variability to draughts in the output 1.1 and to heavy rains with some interventions of 1.3. On the other hand, in this line of action the most vulnerable families have been clearly prioritized.

Regarding **the intervention for the transfer of risks** (output 1.2), as opposed to the previous work, its sustainability is unknown since this is a more innovative proposal, and its generalization depends on the following variables:

- According to insurance companies, there is a fundamental obstacle for small-scale insurance of agricultural production to become a business easily: the insurance premium can be affected by the profitability of agricultural production. On the other hand, the contribution of the national or provincial State usually oscillates, which makes it hard to guarantee the continuity, thus generating uncertainty for the companies. Finally, for the bigger companies the agricultural insurance represents only the 3% of their business. Nevertheless, the prime objective of the project is to provide a policy for small producers: it is necessary to refine the instrument, diversify the risks, collect data and wait some years.

- One benefit is that the Resolution of the National Superintendence of Insurance that approves the policy is very ample: it authorizes its usage all over the national territory (not only in the province of Corrientes) and for all kind of crops under greenhouse. This will allow the project to go from 4 to 12 departments on the second year (4 more in Corrientes and 4 more in Santa Fe) and incorporate new products (not only tomatoes and pepper, but also green beans, cucumber and lettuce), which diversifies besides improving the technical panorama. The authorization does not have a temporal due date. Therefore, the legal base is ample and that encourages profitability.

- Regarding the state complementary in the insurance, ORA is negotiating with the province of Corrientes so it can be in charge of funding the policy once the project ends, supported by Provincial Law that allows this. At the moment there is no convention signed. If this were to occur, it would not guarantee the product to continue, but it would generate favorable conditions for that.

- On the other hand, there are future challenges for producers' attitude. Nowadays the insurance only covers a percentage of the production that gets lost because of hail and the coverage offered in the first pilot test only refers to one part of the losses but does not look upon the climate changes in the region. Besides, there are additional conditions for the payment (for example, the need to change greenhouses immediately). In other words, even though producers do not pay the premium, the coverage is partial and under a set of conditions at the moment, which may not seem attractive for a producer not used to contract insurances. It is necessary to work on the communications in order to prevent producers from disregarding the tool.

- The contribution of this intervention to the GO is direct for the producers who are beneficiaries of the ongoing policies (581 families of small-scale producers at the moment) who feel that both their capacity to adapt and their resilience to climate changes are partially growing. This protection should be spread during the second pilot test, expected for February 2017. However, the planned impact through this intervention is expected to be bigger, thinking of the creation of a market and the permanent offer of this kind of products for a greater territory of producers. The agreements that ORA could obtain at the end of the project will be fundamental on this matter. It will also be important to develop communitarian products, such as revolving funds to complement the offer, but this is still an emerging possibility.

Regarding **the intervention on climate information and the generation of a regional EWS** (component 2), its sustainability is guaranteed for the actions of output 2.1, depending on external variables of 2.2:

- The achievement of a greater capacity of monitoring and evaluation of the climate change and its climate variability obtained through the installation of new stations, the improvement of the existing ones, the integration of the provincial networks and the trainings performed (output 2.1) have a high sustainability. Undoubtedly, both the density of the hydro-meteorological stations as well as the amount of rain meters have increased. Its integration to the existing network of INTA ensures its duration over time beyond the end of the project. Both the identification of the people in charge of the maintenance and the creation of a spare parts stock contribute to this success.

- On the other hand, the technology used is a development of INTA that originated in 2006. The parts of the stations come from a national production and its assembly was done in the Sensors Laboratory of Climate and Water Institution (INTA Castelar). A new model of station was created for the project, according to new technologies, the identified regional demands and the

unification of criteria on the acquisition, update and installation. This new capacity in INTA, a public autonomous organism, ensures the possibility of imitation and future developments; therefore, its duration beyond the project.

- The creation of the EWS is also a local construction, with information from INTA, the provinces, the chambers of commerce, in partnership with the ORA, developed with technicians from the INTA and the CONICET. The new incorporated capacity will also be installed internationally. Nevertheless, the achievement of the interoperability of data continues presenting institutional obstacles which are almost impossible for project's stakeholders to control.

- Finally, the transmission of the program to producers has not yet shown a defined strategy. Though the product is based on local technicians and producers' needs, it is necessary to modify both the communicative strategy of the project and the introduction of the tool in provinces. This should be done together with CNET.

As a conclusion, **the intervention on the generation of capacities** (component 3) is essentially sustainable, though some matters need to be strengthened in the immediate future:

- Use the operative team meetings to discuss the training routinely. Request a quarterly planning to the RPTA.
- Continue the training with producers about climate change while works take place on the field.
- Define a strategy to reach more producers, to whom the training proposals can be difficult due to their lack of availability and their territorial dispersion.

Sustainability
The displayed methodologies (based on self-building and the training of producers and local technicians) and applied technologies (adapted to territorial socioeconomic reality, developed and transferred by public organisms and with high abilities for its imitation) help to predict that sustainability will be high for the majority lines of work. The attained achievements in subcomponents 1.1., 1.3., 2.1, 3.1 y 3.2 are extremely sustainable. The product of the transference of risks developed will last over the time if it is possible to establish a market of insurances for small agricultural producers, which depends on the collaborative work of the State (national and/or provincial), companies and producers. Finally, the creation of a local SAT has improved, but there are challenges regarding the inoperability of data and the reach of the system to producers on the field.

8.2. POSSIBLE IMPACTS AND UNEXPECTED EFFECTS

The general objective of the project does not refer to its impact but to its efficiency: it represents what the project is willing to reach and not its effects on the surroundings or on the public policies related to the adaptability to the climate change. This is evident in its indicator and in the established goal: "at the end of the project, at least 4000 of the most vulnerable families in the project will be benefited from the proposed activities to face climate change and climate variability." The logical framework could have identified a higher level of impact of the project, which is common in other cases. However, preliminarily, the following impacts and positive unexpected effects can be identified, without indicators:

Improvement of women's life quality and their availability for other productive, familiar or personal tasks. Water hauling activities are mainly performed by women and children. On average, technicians have estimated this activity demands between 4 to 5 hours daily per family (65 days per year). Women of the 721 beneficiary families in this subcomponent were released from a task that demands them over two months' time per year. This will probably have a positive impact on the improvement of their children's health or attendance to school, the quality of their agricultural production and even their own welfare.

Improvement of health of the families who can access to drinkable water. In the beneficiary communities, the possibility to access running water daily reduces the risks of diseases and improves every member's health.

Improvement of school attendance of children of beneficiary families. In some communities, the possibility to access running water improved the quality of life and the availability of mothers generated an increase in the school attendance.

Positioning of climate change and access to water topics in INTA and strengthens the role of INTA as a territorial actor. The project has gained some institutional positioning on climate and water at INTA. Moreover, INTA has received support as a local stakeholder as it helped to invigorate RPTA's idea, collaborate with other stakeholders, establish its plan of action for the climate in the minds of the locals and provide concrete responses to previous necessities on the field. According to estimations from the responsible institutions, the project's impact inside INTA is big enough to generate institutional mechanisms of responses towards access to water.

Positioning of INTA and ORA as both favored actors for the interaction with UCAR on international projects of climate change with territorial impact. The hard process of partnership that took place at the beginning of the project, the successful solution of the overcoming challenges, the obtained institutional lessons and the advance in the achievements position these two institutions as interesting counterparts for an imitation on future projects of this partnership. On the other hand, a small project for the UCAR achieved an important commitment and motivation from all the actors in UCAR and Fundación Argeninta. It led to generate a big and complex work team with high motivation and performance.

Possible impacts and unexpected effects on the surroundings

Even though there are references in the design document, the LFM does not have a range of abstraction devoted to identify and measure through an indicator the impact of the project in the enlarged surrounding or in the public policies. The GO's indicator does not measure the impact, but the coverage and the advance of the indicators of the components and subcomponents is not available. In other words, when it comes to the indicators it only counts the performing of the activities. This complicates the chance to estimate possible impacts. However, preliminarily some unexpected positive effects on the enlarged surrounding of the project can be identified: it improves women's quality of life and their availability to do other productive, familiar or personal tasks; it improves children's school attendance; it positions the topics of climate change and access to water in INTA and it strengthens INTA as a territorial actor; it positions both INTA and ORA as favored actors for the interaction with UCAR on international projects of climate change with territorial impact.

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ANNEX I: LOGICAL FRAMEWORK MATRIX

Objective	Indicator	Baseline	Goal
Objective of the Project: Enhancing the adaptive capacity and developing resilience of small-scale agriculture producers towards impacts of climate change and climate variability, especially those impacts that derive from the increase on the intensity of hydro-meteorological events, such as floods and droughts.	Number of vulnerable families to the negative effects of climate change and variability.	At the moment, measures on climate change adaptability have not been implemented.	At the end of the project, at least 4000 of the most vulnerable families in the project will benefit from the proposed activities to face climate change and climate variability.
OE1. Enhancing resilience of small-scale agriculture producers of the Northeast to climate change and its variability. COMP1. Improve the adaptive capacity of small-scale family producers of the Northeast of Argentina to the climate change and its variability.			
Result 1.1 Improvements in water use and productivity for family farmers.	% of producers who improve their ability to respond to effects of climate variabilities	Without installed capacity and infrastructure	At least 20% of the families involved in the project have improved their abilities to respond to the effects of climate change and its variability
	% of beneficiaries who claim improvements in agricultural productivity, related to the access to water.	To be determined during the project's implementation	50% of beneficiaries claim improvements in agricultural production, related to access to water
	% of beneficiaries claiming better access to water for consumption and watering.	To be determined during the project implementation	80% of beneficiaries claim a better access to water for consumption and watering.

Product 1.1 Implementation of improvements on the use, acquisition, collection and storage of water in the intervention.			
Activity 1.1.1 Well drilling to obtain groundwater in quantity and quality	Amount of drilled wells to obtain groundwater	At the end there are not drilled wells in beneficiary communities	138 drilled wells at the end of the project
Activity 1.1.2 Design, refurbishment and building of roofs refurbished to collect rainwater and the building of cisterns to be used as reservoirs.	Amount of families with refurbished roofs to water collect of rain and cisterns (separated by genre)	At the moment, there are not refurbished reservoirs and roofs to capture rainwater in the area of intervention.	266 families with refurbished roofs for rain water collection and cisterns (3rd year)
Activity 1.1.3	Amount of communitarian reservoirs	0 Communitarian reservoirs	145 communitarian reservoirs
Development of water capture and storage systems: construction of communitarian reservoirs for big and small livestock	built for big and small livestock	Built up to now in the beneficiary communities	built (3rd year) (Estimated: 5 families per reservoir – 739 assisted families)
Activity 1.1.4 System of multi-purpose water supply for human consumption, animal watering, vegetable, orchard and pasture watering.	Amount of multi-purpose water supply systems built	Up to now there were not initiatives to build multi-purpose water supply systems	140 multi-purpose water supply systems built (3rd year). (Estimated 1 system per family)
Result 1.2 Decrease in the income variability for the familiar agricultural producers, encouraging their continuity in the activity and rural areas	% of beneficiary population covered by appropriate mechanisms of transference of risks (separated by genre)	0 % of families of the project with access to insurances	At least 15% of the families in the project were selected for the implementation of transference mechanisms
	% of the beneficiaries of instruments of transference of risks perceive a decrease of risks towards extreme events	To be determined during the implementation of the project	At least 50% of the beneficiaries of the instruments of transference of risks claim a decrease on risks towards events

Product 1.2 Implementation of a system for the management and of risk transfer dedicated to small and medium-scale agriculture producers. Development of two pilot tests on the selected area.			
Activity 1.2.1 A feasibility research to develop a pilot plan of global insurance against multiple risks directed to small producers of cereals, oleaginous plants and cotton that have not had access to any subsided plan of insurance in previous periods, with the premium partial subsidy.	Development of the feasibility research	Up to now no research has been performed	The research is completed by the end of the first year of the implementation of the project.
Activity 1.2.2 Feasibility research to develop a pilot plan of risks management directed to small agricultural producers whose main activity is horticulture.	Development of the feasibility research	Up to now no research has been performed	The research is completed by the end of the first year of the implementation of the project.
Activity 1.2.3 Implementation and monitoring of execution of pilot programs.	Number of families included in Pilot Programs (separated by genre)	Without insurance coverage	787 families included in the Pilot Programmes
Activity 1.2.4 Evaluation of Pilot Programs, previous experiences and recommendations to local governments.	Develop evaluation of Pilot Programs performed.	0 evaluation performed	Completed at the end of the implementation of the project.
Result 1.3 Increase in agricultural production of small agricultural familiar producers and reduction of the economic vulnerability towards climate change and climate variability.	Number of small-scale family farmers with a more secure access to livelihood	0,8% of the families in the project received assistance in different agricultural practices	10% of the families in the project claim their access to livelihood has improved.
	% of beneficiaries claiming improvements in their food safety due to the project's activities.	To be determined during the implementation of the project	50% of beneficiaries claiming improvements in their food safety due to the project's activities.

	% of beneficiaries claiming an increase in their incomes due to the project's activities.	To be determined during the implementation of the project	At least 30% of beneficiaries claiming an income increase due to the project's activities
	% of the beneficiaries with a better access to markets.	To be determined during the implementation of the project	At least 30% of the beneficiaries have a better access to markets.

Product 1.3 Management optimization practices of agricultural, livestock and forestry production in all of the areas of intervention.			
Activity 1.3.1 Assistance to indigenous peoples in the creation of fruit and vegetable homegrown and small animals breeding	Number of indigenous families who receive technical assistance (separated by genre)	15 families with fruit and vegetable homegrown and small animals breeding	82 families who receive assistance at the end of the project
Activity 1.3.2 Management and usage of forage resources	Amount of families who receive assistance in the management and usage of forage resources (separated by genre)	29 families receive assistance in the management and usage of forage resources	473 families who receive assistance at the end of the project
Activity 1.3.3 Implementation of techniques of ground management by tillage following the curves of level and/or the incorporation and management of the coverage farming and green crops.	Amount of families who receive assistance in the implementation of techniques of ground management (separated by genre)	0 families with assistance	119 families who receive assistance at the end of the project
Activity 1.3.4 Adaptability to extreme temperatures by means of structures of crops protection	Amount of families who receive assistance by means of structures of crops protection (separated by genre)	20 families who receive assistance	272 families who receive assistance at the end of the project
Activity 1.3.5 Incorporation of equipment and improvement of facilities	Amount of families who receive technological assistance and improvement of facilities (separated	20 families who receive assistance	109 families who receive assistance at the end of the project

	by genre)		
OE2. Strengthen the hydro-meteorological and agro-productive monitoring systems in order to improve the institutional capacity of evaluating climate changes and their impacts on the agricultural livelihood systems. COMP2. Strengthen the information, monitoring and management systems of climate information.			
Result 2.1 Greater supervision and evaluation capacity of the climate change and the climate variability	Increase of the density of hydro-meteorological stations and rain meters	Very low density of coverage per monitoring stations	20% of increase in the density of hydro-meteorological stations and rain meters
Product 2.1 Integration and expansion of agro-hydrometeorological networks of NEA			

Activity 2.1.1 Development, assembly, installation, adjustment and monitoring of automatic meteorological stations.	Amount of automatic meteorological stations totally operative	Stations of monitoring connected to the monitoring networks of SMN and INTA, 35 automatic stations and 22 rain meters in the area of the project	18 automatic meteorological stations totally operative by the end of the project
Activity 2.1.2 Transformation of simple automatic stations to complete measure stations	Amount of simple automatic stations totally converted into complete measure stations	0 complete stations converted	10 simple automatic stations totally converted into complete measure stations at the end of the project
Activity 2.1.3 Integration of networks after an inspection and thorough inventory of automatic stations and collection of existing data	% of integration of meteorological networks	0% of integration of networks	100% of integration of meteorological networks at the end of the project
Activity 2.1.4 Strengthen of Information Systems of local nodes	% of Information Systems of totally operative local nodes	0% of Information Systems of local nodes are operative	100% of Information Systems of local nodes totally operative

Activity 2.1.5 Inoperability, standards and quality of data, unification of database agro meteorological and hydro-meteorological from local and national institutions	% of online availability of the information integrated system	0 % of online availability of the information integrated system	100% of the integrated system available online
Result 2.2 Basic systematized information freely available to make an efficient decision related to the producers adaptation to adverse conditions directed to local and national planning	Number of government professionals involved in the decision-taking by using early alert systems and climate information platforms as a base to make decisions	The early alert system only partially covers the provinces of Chaco and Santa Fe	Increase of at least 25% of users of early alert systems and climate information platforms
Product 2.2 Development of an Early Warning Integral System and Decision Making to evaluate and improve climate risks, including extreme events			

Activity 2.2.1 Database gathering, integration and analysis and geographically referred maps for the area of intervention related to hydrological, topographic, edaphic, hydro-meteorological, meteorological and geomorphological characteristics	% database gathering and evaluation and geographically referred maps for the area of intervention	0% of database gathering and evaluation and geographically referred maps for the area of intervention	100% of gathering and evaluation and geographically referred maps for the area of intervention
Activity 2.2.2 Essays on demonstration plots to evaluate hydric requisites of cotton crops	Amount of essays performed	0 essay performed	At least 3 essays performed of the project's implementation per year
Activity 2.2.3 Creation of risks maps in terms of draughts, water deficit and excess of water for implanted and natural pastures	% of the project area's surface with maps of risks developed	35% of the project area's surface with maps of risks developed	70% of the project area's surface with maps of risks developed at the end of the project
Activity 2.2.4 Development of a monitoring system of soil moisture based on the operative implementation of the hydric balance algorithm	% of implementation of a monitoring system of soil moisture	30% of the project area with the installed supervision system	At least 60% of the project area with monitoring system
Activity 2.2.5 Scenarios analysis of climate change and climate trends with its impact on crops production	% of development of scenarios analysis of climate change and climate trends with its impact on crops production	No regional scenarios of climate change nor acknowledgment on impacts on crops	100% of analysis performed at the end of the second year of the project's implementation
Activity 2.2.6 Integration of the hydrological alert component to the early alert system	Development of the early warning system	No hydrological monitoring system and no vulnerability determination on the appropriate scale or place	Early warning system operative to the end of the project
Activity 2.2.7 Meteorological warning component, integrated to the early alert system	Development of the early warning system	No integrated system of decision taking with climate alert components	Early warning system operative to the end of the project

Activity 2.2.8 Development of an integral web platform that allows access to the early alert system	% of development of the web platform	0% of the platform developed	100% of the developed platform totally operative at the end of the project's implementation
COMP3. Creation of local and regional capacities on the impact on climate change and its variability and implementation of adaptability measures.			
Result 3 Unities of municipal and provincial government, educational environments and producers, with capacities to generate appropriate adaptation interventions	Result 3 Unities of municipal and provincial government, educational environments and producers, with capacities to generate appropriate adaptation interventions	Result 3 Unities of municipal and provincial government, educational environments and producers, with capacities to generate appropriate adaptation interventions	60% of the producers trained to implement measures in their exploitation plots and 70% of government technicians and officials
Product 3.1 Development of training and communication modules, together with transference of risks for government technicians and small agricultural producers			
Activities 3.1.1 to 3.1.7 included	% of personnel and population beneficiaries trained on negative expected impacts from climate change and appropriate responses	Up to now no training performed	80% of personnel and population receivers trained up to the end of the project's implementation
Product 3.2 Training for unities of municipal and regional government for the hydro-meteorological management, supervision and analysis of climate information, use of meteorological tools and development of adaptability modules			
Activities 3.2.1 to 3.2.4 included	Amount of institutions trained on the use of early alert systems and associated tools	Up to now no training activities performed	At least 1 trained institution per province participating in the project

Activity 3.2.5 Verification mechanisms and sources: advance reports, surveys, visits to the site, training reports, national and agricultural population census, national broadcast	Amount of publications and meetings to organize the broadcast	3 publications during the preparation of the project	At least 8 publications and 1 meeting per year

ANNEX II: LIST OF RPTA OF INTA ASSOCIATED TO THE PROJECT

Province	Coordinator	RPTA	AER´s	No. of technicians	Title
CHACO	**Rosalino Ortiz**	CHAFOR-1241101	SAENZ PEÑA	3	CONTRIBUTION TO THE DEVELOPMENT OF THE CENTER-NORTH TERRITORY OF CHACO IN TERMS OF SOCIAL EQUITY, SUSTAINABILITY AND COMPETIVENESS.
			CAMPO LARGO	1	
			QUITILIPI	1	
			MACHAGAI	3	
			CAPITÁN SOLARI	1	
			LAS GARCITAS	1	
			PCIA. DE LA PLAZA	2	
			TRES ISLETAS	2	
	Vicente Rister	CHAFOR-1241102	VILLA ÁNGELA	4	Project of Support to the socio-productive development with territorial approach of the Dorsal Sur of the province of Chaco
			SANTA SILVINA	2	
			VILLA BERTHET	1	
	Alejandro Moreno	CHAFOR-1241103	CASTELLI	4	Support to the socio-productive and environmental development of the impenetrable Chaco
			PAMPA DEL INFIERNO	2	
			VILLA RIO BERMEJITO	1	
	Omar Loto	CHAFOR-1241204	GENERAL PINEDO	7	The EEA INTA Las Breñas and its contribution to the Territorial Development Management in its area of influence.
			LAS BREÑAS	6	
	Flavia Francescutti	CHAFOR-1241305	BASAIL	2	Contribution from the territorial approach to the sustainable development of the Eastern area of the
			MAKALLE	1	

			LAS PALMAS	4	province of Chaco
			METROPOLITANA	3	
			COLONIA BENITEZ	2	
	Héctor Ferrario	CHAFOR-1241408	SAN MARTÍN	2	Territorial development of the Antiguo Delta del Bermejo (Lib. Gral. San Martín-Chaco Department and Pirané-Formosa Department)
			PAMPA DEL INDIO	2	
CORRIENTES	**Alejandro Kraemer**	CORRI-1243101	Caa Catí	4	REGIONAL PROJECT WITH TERRITORIAL APPROACH NORTH WETLAND OF THE PROVINCE OF CORRIENTES
			Área Norte (Ituzaingó)	3	
	Jorge Rosso	CORRI-1243102	Corrientes	5	Northwestern Territorial Project of the Province of Corrientes
	Rául Grandoli	CORRI-1243203	Esquina	4	STRENGTHENING OF THE DEVELOPMENT PROCESS WITH TERRITORIAL APPROACH IN THE SOUTHWESTERN OF THE PROVINCE OF CORRIENTES (LAVALLE, GOYA AND ESQUINA)
			Goya	9	
	Víctor Beltrán	CORRI-1243204	Bella Vista	6	
			Santa Rosa	3	Contributions to the sustainable development of Bella Vista, Saladas, San Roque, Concepción and Mburucuyá departments, in the province of Corrientes
			Saladas	2	
SANTA FE	**Marcelo Paytas**	SANFE-1261307	Tostado	4	Sustainable development with territorial approach in the Western Dome of the North of the province of Santa Fe
	Hernán Pietronave	SANFE-1261308	Garabato	4	Territorial development of the Lower Submeridian/ and the Cuña Boscosa of the north of Santa Fe
			Calchaquí	4	
	Marcela Menichelli	SANFE-1261309	Reconquista	7	Contributions to the development with a territorial approach in the Orient Dome and Islands in the north of Santa Fe
			San Javier	4	
			Las Toscas	4	
SANTIAGO DEL	**Gustavo Coronel**	TUSGO-1231407	Añatuya	3	Contributions to the Territorial Development and Support

ESTERO			Bandera	3	to strengthening of Regional economies of the Southeast of the province of Santiago del Estero
			Malbrán	3	
	Dino Gómez	TUSGO-1231408	Monte Quemado	2	Contribution to the Management of Territorial Development of the Northeast of Santiago del Estero
			Quimilí	2	
			Sachayoj	1	
	15	**15**	**43**	**134**	

ANNEX III: LIST OF INTERVIEWED PEOPLE

UCAR UAS: Mario Nanclares, Laura Abram Alberdi, Jorge Arias Almonacid and Gabriela Amadeo.

UCAR Management Control: Soledad Moreiras and Andres Nakab

UCAR other areas: Maria Angeles Calvino and Maria Cristina Benegas.

INTA CNTE: Diego Ramilo, Lucas Vázquez and Iris Dagmar Bath.

INTA CIRN: Pablo Mercuri and Marcelo Belloni.

INTA Coordinators RPTA (CN Chaco/Formosa): Hector Omar Ferrario and Flavia Francescutti.

MINAGRO/ORA: Sandra Occhiuzzi.

National Ministry of Environment and Sustainable Development: Lucas Di Pietro.

Ministry of Production of the Province of Corrientes: Luis Almirón.

Insurance Company La Segunda: Santiago Cabral.