



ADAPTATION FUND

AFB/PPRC.9/4
15 June 2012

Adaptation Fund Board
Project and Programme Review Committee
Ninth Meeting
Bonn, 26-27 June 2012

PROPOSAL FOR ARGENTINA (UCAR)

I. Background

1. The Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, adopted by the Adaptation Fund Board, state in paragraph 41 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US\$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the approval by the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would finally require Board's approval.

2. The Templates Approved by the Adaptation Fund Board (Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, Annex 3) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

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

3. The first four criteria mentioned above are:

1. Country Eligibility,
2. Project Eligibility,
3. Resource Availability, and
4. Eligibility of NIE/MIE.

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

5. In its 17th meeting, the Adaptation Fund Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", contained in the Annex to document AFB/PPRC.8/4, which further outlines applicable review criteria for both concepts and fully-developed proposals.

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

7. According to the paragraph 41 of the operational policies and guidelines, a project or programme proposal needs to be received by the secretariat not less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

8. The following project concept titled “Enhancing the Adaptive Capacity and Increasing Resilience of Small-size Agriculture Producers of the Northeast of Argentina” was submitted by the Unidad para el Cambio Rural (UCAR), which is the National Implementing Entity of the Adaptation Fund for Argentina.

9. This is the first submission of the project concept, using the two-step approval process, and it was received by the secretariat in time to be considered in the 18th Adaptation Fund Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number ARG/NIE/Agri/2012/1, and filled in a review sheet.

10. In accordance with a request to the secretariat made by the Adaptation Fund Board in its 10th meeting, the secretariat shared this review sheet with UCAR, and offered it the opportunity of providing responses before the review sheet was sent to the Project and Programme Committee of the Adaptation Fund.

11. The secretariat is submitting to the Project and Programme Review Committee the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. Finally, UCAR has submitted a Project Formulation Grant Request, which is also available as an addendum to this document.

II. Project Summary

Argentina – Enhancing the Adaptive Capacity and Increasing Resilience of Small-size Agriculture Producers of the Northeast of Argentina

Implementing Entity: *UCAR*

Project/Programme Execution Cost: USD 450,000

Total Project/Programme Cost: USD 5,200,000

Implementing Fee: USD 440,000

Financing Requested: USD 5,640,000

Project/Programme Background and Context: Argentina's economy is favored by important natural resources and well-trained human resources. Although agricultural activity represents less than 6% of the GDP, this activity accounts for a high percentage of exports and is the basis for industrial manufacture of agricultural origin, which is another important export-oriented business. The project targets family agricultural holdings or production units found in the mid-south region of the province of Chaco, the western region of the province of Corrientes and the northern area of the province of Santa Fe. The current and projected climate threats include increased water deficit and an increase in the frequency and intensity of floods of fluvial origin. Changes in land uses, among many other factors, will contribute to an increase in the flooding risk, both fluvial and pluvial in origin.

The main objective of the project is to increase the adaptive capacity and to build resilience of small-scale family agricultural producers in the face of climate change and climate variability impacts, particularly those deriving from the increase in the intensity of hydrometeorological events, such as floods and droughts.

The project presents three components:

- **Component 1:** Increase of the adaptation capacity of small-scale producers of the NEA to address climate change and climate variability;
- **Component 2:** Strengthening of information, monitoring and climate information management systems;
- **Component 3:** Generation of local and regional capabilities on the impact of climate change and variability and the implementation of adaptation measures

Component 1: Increase of the adaptation capacity of small-scale producers of the NEA to address climate change and climate variability (USD 3,000,000)

Through this component, the best agricultural practices will be adopted, combining applied technologies to each one of the production areas and crops, aimed at producing better yields, higher quality and stability of the productions, preserving natural resources and the rural setting. The optimization of agricultural practices and the implementation of best practices adapted to climate variability will help achieving sustainability of the resources in this scenario, particularly soil resources. Through this project, it is also sought to reach out to insurance companies for them to implement two pluri-annual pilot plans, so that public-private partnership (PPP) and the grant of partial subsidy to pay for the premiums may make up for the market's failure and the conditions should arise for the design of a program for the transfer of risks aimed at small-scale

producers. Finally, it is proposed to make available hybrid technologies adequate for catchment, harvesting and storage of water for small-scale producers through module systematisation. These will allow to carry out an efficient management of the resource, storing water in the periods when there is surplus for subsequent use in times of water deficit.

Component 2: Strengthening of information, monitoring and climate information management systems (USD 1, 400,000)

One of the main constraints at the time of making decisions for the implementation of measures of adaptation to climate change and reduction of risks of disasters is the degree of certainty regarding climatic events on the mid and long terms. This component is designed to support the strengthening processes of the regional and local information systems of the NEA region, including warning systems, contributing at the same time to improve the national monitoring systems fulfilling any commitments undertaken in the matter. The traditional pluviometers will be substituted with electronic pluviometers approved by the SMN with communication via mobile phone, as well as the setting-up of more full weather stations which will allow the monitoring of other variables and the unification of the information in a consolidated database in systems open to the public. Finally, an integrated early warning and decision-making system to assess and manage climate risks, including extreme events, will be developed.

The data collected by the new stations and the integration of the networks are expected to feed the processes of other sub-components such as the early Warning System, and the development of regional climate models and vulnerability maps of the following outputs. The outputs generated will be integrated into a geographic information system (GIS) to enable the combination of climate, physiognomy, geographic, infrastructure and vulnerability and risk information available for the different areas of intervention. This information system will help support the different analyses of impacts of climate, social vulnerability information, the geographic impact on the project's components, and any emergency situations that may arise as a result of climate variability and climate change.

Component 3: Generation of local and regional capabilities on the impact of climate change and variability and the implementation of adaptation measures (USD 350,000)

This component centres around the generation of local and regional capabilities and around communication to a broad array of direct and indirect stakeholders on the issue of climate change and variability, particularly on the progress, results, lessons learned, and best practices deriving from the project's implementation. The communication of hydrometeorological hazards and adaptation measures, both at different governmental levels and at the level of the project's direct beneficiaries, will promote the inclusion of key stakeholders both in the development of public policies and in decision-making.

This Component includes the development of workshops and seminars training programs for junior and senior-level local government officials and the generation of educational material for communicating and forming in the issue at hand and the adaptation measures implemented.



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III. Project review sheet

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: REGULAR PROJECT CONCEPT

Country/Region: **Argentina**

Project/Programme Title: **Enhancing the Adaptive Capacity and Increasing Resilience of Small-size Agriculture Producers of the Northeast of Argentina**

AF Project ID: **ARG/NIE/Agri/2012/1**

NIE/MIE Project ID:

Requested Financing from Adaptation Fund (US Dollars): **5,640,000**

Regular Project/Programme Concept Approval Date (if applicable): Anticipated Submission of final RP document (if applicable):

Reviewer and contact person: **Daouda Ndiaye**

Co-reviewer(s): **Ulrich Apel**

NIE/MIE Contact Person: **Mario Nanclares**

Review Criteria	Questions	Comments on May 14, 2012	Comments on June 2, 2012
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes.	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes. The targeted project area is particularly vulnerable to drought and flooding.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes, letter signed April 25, 2012.	

	<p>2. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?</p>	<p>The project supports 3 major adaptation actions: (1) Improvement of the adaptive capacity of small-scale agricultural producers, (2) Improvement of climate change information management systems, and (3) Strengthening local and regional capacities for adaptation.</p> <p>However, the link between the identified problems with the proposed project activities, especially those in component 1, is not fully clear.</p> <p>CR1: Based on the analysis of the climate change and the scenarios presented in part I, please make a stronger link between the identified problems with the proposed project activities, especially those in component 1. For example, it is not obvious how the introduction of best agricultural practices to increase yield and quality directly addresses the identified problems.</p> <p>CR2: Please provide more detailed information on the agricultural production systems, farm size and land tenure, and the socio-economic situation of the target group as well as an estimation of the area and number of households that will be covered by the activities under component 1.</p> <p>Further, the ecological characteristics of the province of Santa Fe, which is part of the target areas, are not described. CR3: Please describe, as for the other target areas of the project, the ecological characteristics of the province of Santa Fe.</p>	<p>CR1: Partially addressed. The full proposal will have to detail for each identified climate threat, the types of activities that will be implemented, aiming at addressing it.</p> <p>CR2: Addressed. However, the full proposal should specify the proportion of classes(A, B, C, D) of family-based EAP that will be targeted, making sure that the most vulnerable ones will be prioritized.</p> <p>CR3: Addressed.</p>
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	<p>The assessment of the social and economic vulnerability of the region through the EHD/ UNDP study is outdated (2002). Are there any new data available since then? CR4: Please clarify if the social and economic vulnerability assessment dated 2002 is still relevant and whether there are more recent data available.</p> <p>CR5: Under Output 1.1, the activities/subprojects for the target eco-regions should be specified, even at the concept stage. They should be linked to the climate risks and hazards that the project is trying to address.</p> <p>CR6: For output 1.2, the design of the risk management instrument should involve insurance companies.</p>	<p>CR4: Addressed.</p> <p>CR5: Partially addressed. See CR1.</p> <p>CR6: Addressed.</p>
	<p>CR7: Output 1.3 needs detailing the activities that will be carried out. Moreover, there is no information on flood-related adaptation measures.</p> <p>CR8: Finally, it is said in the document that “connecting family-based agriculture with the market and processing of agricultural produce under circumstances of social inclusion and environmentally sustainable management is a key strategy for the development of the region”. This is linked to outcome 1 of the project. Please specify if this will be taken into account by the project or else, if another initiative within the country is dealing with that issue.</p> <p>CR9: Under component 2, the scope of the activities is not clear. Are they going to be implemented at the national level or only in the targeted regions? Also, please explain why the outputs 2.2 to 2.4 cannot be integrated into one</p>	

		single warning and decision making system for climate risks, including extreme events. As it is, some activities under those 3 outputs may be redundant.	<p>CR7: Addressed. The full proposal is expected to provide more details on this.</p> <p>CR8: Addressed.</p> <p>CR9: Addressed.</p>
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations?	The project provides a number of benefits. However, the proposal does not provide enough information on the activities which will be implemented under component 1. CR10: In order to better assess the benefits for vulnerable communities, section B of project concept should be more concise on what concrete benefits the project will provide to vulnerable communities and how the project will contribute to strengthening and diversifying livelihoods. Also, the benefits for gender groups are not explained.	CR10: Addressed. More detail on the socio-economic benefits is expected at the full proposal stage.
	4. Is the project / programme cost effective?	Cost effectiveness cannot be fully assessed at this stage. There is little information on the target groups, i.e. number of beneficiaries, targeted coverage of the interventions, number of people to be trained, etc. CR11: Please provide an <i>estimate</i> of how many beneficiaries the project will target, area to be covered, how many pilots are planned so that cost efficiency can be assessed.	CR11: Addressed.

	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	Yes. The project is consistent with national sustainable development and other related strategies. However, what is also needed is a demonstration of the project's consistency with national adaptation programs of action. CR12: Please demonstrate the project's consistency with national adaptation programs of action. CR13: Further, as the small-scale farmers to be targeted are in fact marginalized and are farming on marginal lands, it would be important to discuss how competitiveness of the project beneficiaries can be ensured and whether the national policies provide for an inclusion of small-scale agricultural producers into the mainstream in the long-term.	CR12: Addressed. CR13: Addressed.
	6. Does the project / programme meet the relevant national technical standards, where applicable?	Yes.	
	7. Is there duplication of project / programme with other funding sources?	No. However, CR14: please describe in a table the synergies that will be sought with or lessons to be learnt from the current or past initiatives related to agriculture and climate change, including risks monitoring and the development of risks insurance. This may include some of the initiatives described under Part II Section D, ex. PRODEAR, PROSAP, PROINDER etc.	CR14: Addressed.
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes. A knowledge management subcomponent is available under component 3 (output 3.1). CR15: Please elaborate on how the knowledge management component will contribute to the replication of the project results in general, and in particular of the pilots.	CR15: Addressed.

	<p>9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?</p>	<p>Yes. A consultative process has started and will be further documented in the full proposal. The concept also emphasizes the importance of a participatory approach. In the full proposal, please describe how the project will pursue a participatory agenda in its implementation. CR16: In the concept, please provide information about the selection criteria for participating households. CAR1: Please provide a table describing the different stakeholders consulted, including information on gender and vulnerable groups, including indigenous peoples. Also, for output 1.2, the consultative process should include insurance companies, even at the concept stage.</p>	<p>CR16: Addressed. CAR1: Addressed.</p>
	<p>10. Is the requested financing justified on the basis of full cost of adaptation reasoning?</p>	<p>This is difficult to assess based on the provided information. The concept makes a general case for funding support for an adaptation project. However, the reasoning for the full cost of adaptation needs to be improved. The question to be discussed here is whether the component costs represent full costs of adaptation. A better description of the activities and the scope of the project intervention would help assessing if the funding requested will address the adaptation issue targeted by the proposal. CR17: Please demonstrate in a better way the full cost adaptation reasoning of the project, including a better description of the activities and the scope of the project intervention and how it would help addressing the identified adaptation issue.</p>	<p>CR17: Partially addressed. At the full proposal stage, the adaptation reasoning will have to be demonstrated more clearly, for each component.</p>
	<p>11. Is the project / program aligned with AF's results framework?</p>	<p>Yes. It is aligned with Outcome 1 "Reduced exposure at national level to climate-related hazards and threats" and Outcome 4 "Increased adaptive capacity within relevant development and natural resource sectors" of the AF results framework.</p>	

	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Not clear. Although the component 2 and 3 are coherent, the component 1 does not provide enough information to assess the sustainability of the proposed interventions. CR18: Please discuss in the concept how the project intends to ensure sustainability of the investment on the marginal lands. How can competitiveness of smallholders be ensured in the long-term? How will the project guarantee that no further expansion of the agricultural frontier and displacement of smallholders onto marginal lands will take place in the future?	CR18: Addressed.
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes.	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	No. The requested IE fee is at \$476,000 or 9.29% of the total budget. CAR2: please revise the IE management fee, to comply with the 8.5% cap.	CAR2: Addressed. The IE fees is now at 8.46%
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	No. The requested execution costs are set at \$532,000 or 10.38% of the total budget. CAR3: please revise the amount of execution costs, to comply with the 9.5% cap.	CAR3: Addressed. The execution costs are now at 8.65%
Eligibility of NIE/MIE	4. Is the project/programme submitted through an eligible NIE/MIE that has been accredited by the Board?	Yes. UCAR is an accredited NIE.	
Implementation Arrangement	1. Is there adequate arrangement for project / programme management?	n/a (Not required at Project Concept stage).	
	2. Are there measures for financial and project/programme risk management?	n/a (Not required at Project Concept stage).	
	3. Is a budget on the Implementing Entity Management Fee use included?	n/a (Not required at Project Concept stage).	

	4. Is an explanation and a breakdown of the execution costs included?	n/a (Not required at Project Concept stage).	
	5. Is a detailed budget including budget notes included?	n/a (Not required at Project Concept stage).	
	6. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	n/a (Not required at Project Concept stage).	
	7.		
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a (Not required at Project Concept stage).	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	n/a (Not required at Project Concept stage). <i>Please note that as of the 14th AFB meeting, fully developed project/programme proposals are required to provide a table indicating alignment of project/programme objectives with the AF results framework. A template will be available on the AF website.)</i>	
	10. Is a disbursement schedule with time-bound milestones included?	n/a (Not required at Project Concept stage).	

Technical Summary	<p>The main objective of the project is to increase the adaptive capacity and to build resilience of small-scale family agricultural producers in the face of climate change and climate variability impacts, particularly those deriving from the increase in the intensity of hydro-meteorological events, such as floods and droughts.</p> <p>The specific objectives of the project are:</p> <ol style="list-style-type: none"> 1. To enhance the resilience of small-scale agricultural producers from the Northeast in light of climate change and variability. 2. To strengthen hydro-meteorological and agro-production monitoring systems to improve the institutional capacity of assessing, and planning for, climate change impacts in the agricultural subsistence systems.
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3. To enhance institutional capacity, both at national and provincial/local level, for decision making and management of the implementation of adaptation measures and actions to address climate change and variability in northern Argentina.

The initial technical review found that the project concept presented a comprehensive and well-balanced approach to address problems created by extreme climate variability in North eastern Argentina and its negative effects of drought and floods while focusing on support to vulnerable small-scale agricultural producers. However, there were several issues identified, which required additional information and clarification, including the need for more information on the target areas or beneficiaries, more clarity about the activities that would be implemented under component 1 and following which criteria the beneficiaries of such activities would be chosen.

Consequently, the proponents were asked to clarify the above mentioned issues and others outlined in the initial review, as expressed through clarification requests (CR) and corrective action requests (CAR). A revised document was resubmitted to the secretariat, adequately addressing most of the requested clarifications.

The proponent should consider to address the following issues when submitting a full proposal:

- a) The full proposal will have to describe for each identified climate threat, the types of activities aiming at addressing it that will be implemented under Component 1;
- b) The full proposal should specify the proportion of classes (A, B, C, D) of family-based EAP that will be targeted, making sure that the most vulnerable ones will be prioritized;
- c) The full proposal should provide more details on the hybrid technologies adequate for catchment, harvesting and storage of water for small-scale producers, under component 1;
- d) The full proposal should provide more detail on the socio-economic benefits expected from the project;
- e) In the full proposal, further cost efficiency should be explored and mechanisms outlined on how to ensure replication and upscaling;
- f) In the full proposal, the adaptation reasoning should be demonstrated more clearly, for each component.

Date:

June 3, 2012.



PROJECT/PROGRAMME PROPOSAL

■ PART I: PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY: FULL-SIZE PROJECT
 COUNTRY/IES: REPUBLIC OF ARGENTINA
 SECTOR/S: AGRICULTURE AND RISK REDUCTION
 TITLE OF PROJECT/PROGRAMME: **ENHANCING THE ADAPTIVE CAPACITY AND INCREASING RESILIENCE OF SMALL-SCALE AGRICULTURE PRODUCERS OF THE NORTHEAST OF ARGENTINA**
 TYPE OF IMPLEMENTING ENTITY: NATIONAL IMPLEMENTING ENTITY
 IMPLEMENTING ENTITY: UNIDAD PARA EL CAMBIO RURAL (UCAR - UNIT OF RURAL CHANGE)
 EXECUTING ENTITY/IES: MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERY; NATIONAL INSTITUTE OF AGRICULTURE TECHNOLOGY, AND; NATIONAL SECRETARIAT OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
 AMOUNT OF FINANCING REQUESTED: 5.640.000 (In U.S Dollars Equivalent)

■ PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline relevant climate change scenarios according to best available scientific information. Outline the economic social, development and environmental context in which the project/programme would operate.

Introduction

Argentina's economy is favored by important natural resources and well-trained human resources. Although agricultural activity shares in less than 6% of the GDP, this activity accounts for a high percentage of exports and is the basis for industrial manufacture of agricultural origin, which is another important export-oriented business.

Between 1998 and 2002 Argentina's economy experienced a prolonged downturn and severe crisis. Economic recovery began upon the second quarter of 2002, and steady growth has been recorded ever since. Such growth brought about an improvement in social indicators, highly affected by the aftermath of the depression. Job increase and the restoration of salary levels have allowed a reduction of poverty and an improvement in income distribution. Unemployment is currently about 6.7% for the first quarter of 2012, and poverty levels in cities per person account for 8.3%. However, bearing in mind the size and the productive, social and environmental diversity of Argentina, the scenario is not uniformly distributed, with the case being for the Northeast region of Argentina (NEA) of 14.4%. As a result, there is a need to focus the efforts of all actors

on those populations of greater vulnerability and therefore most sensitive to climate change related impacts. In these terms, the strengthening of food security and access to markets of small-scale producers must be a part of a key strategy to attain sustainable development of the poorest.

Next, there follows a characterization of the social and production conditions of the area of intervention, including the main indicators of social vulnerability of the region and the results deriving from the assessment of climate variability and climate change. It is in these terms that the specific area of Argentina's north-east has been established as area of intervention, considering small-scale agricultural family-based producers as the target population.

Considering the experience and technical expertise of the agencies involved in the development of the project, general intervention lines have been identified. The identification and final design of the specific actions to be conducted in each one of the components and areas of intervention will be in the lines of the performance of participatory consultation process with local stakeholders, both governmental in nature and the beneficiaries themselves, to be carried out during the preparation of the full-size project proposal. During the above mentioned process, the diversity of systems and the very same agricultural activities characterizing the region and described herein below will be considered for the definition of both actions and areas.

Characterization of Northeastern Argentina

Argentina's northeast comprises a surface area of 338,679 Km² (12.1% of Argentina's continental surface area) and, from an environmental viewpoint, is widely diverse. The provinces of Formosa, Chaco and the east of the province of Corrientes comprise the eco-region of *Gran Chaco*, a vast sedimentary plain, extremely flat, shaped by the action of rivers cutting through its surface ground following a northwest-southeast direction, to wit rivers Juramento-Salado, Bermejo, Pilcomayo and Tafi-Dulce. These rivers carrying considerable discharge during the year as well as a high content of sediments show a strong instability in their courses and channels.

To the east of the province of Corrientes, there prevails a swamp-like environment (ponds and marshlands) interconnecting vast shallow basins, linked together through water courses. In Misiones province the *Selva Paranaense* prevails, which is a tropical rainforest with very high biodiversity with areas relatively flat and thick soil (in the proximity of the Parana river and other main rivers) and a relatively flat plateau with elevations of 550 to 800 m above sea level. Climate is of the subtropical kind, with annual precipitation ranging between 1,000 and 2,200 mm.

The east border of Formosa and Chaco and the west of Corrientes comprise the eco-region of Delta and Parana islands, a wetland macro-system, fluvial in origin, stretching from north to south. Such system includes both the fluvial corridor and alluvial floodplains of the lower basin of the Paraguay river (from the province of Formosa to the outlet into the Parana river, at Paso de La Patria) and the Mid and Lower Parana sections. The system dynamics is closely connected to **flood and drought pulses**.

Furthermore, water largely derives from other regions and there is a delay of a few months between precipitation at the higher basins and the water levels of the large rivers. Climate is warm (mean annual temperature is 22° C) and rainfall reaches annual 1,350 mm, mostly in the summer.

In spite of its high ecologic value, these wetlands suffer disturbances including draining, channeling works, water impounding for dams, uses as dump pit for toxic substances, and filling for urban developments, among others.

The province of Santa Fe can be divided into two main geographic areas, the “Chaqueña” in the north and the “Pampean” in the south. The north area presents high temperatures, with an annual mean of 21°C. Mean precipitation ranges from 800 to 1100 mm annually, declining toward the west, where the climate becomes dryer.

In the northwest of Santa Fe climatic conditions are characterized as subtropical with dry season, with a strong oscillation in temperatures between seasons and wet summers. In the northeast, on the other side, the climate is subtropical without dry season, and this means precipitation above 1000mm annually.

The eco-region of northern Santa Fe is characterized by the presence of wetlands, amongst the most important ones in the country, with an extension of 3.3 million Ha, accounting for more than 20% of the province’s surface area. This region, like Chaco and Corrientes, is prone to alternative pulses of floods and droughts, with the consequence of land degradation and salinization, which affect the already precarious situation of the small-scale farmers.

In contrast with the rich diversity of species, soils, landscapes and cultures, Argentina’s northeast region is the area with the greatest poverty indicators in the country, as will be shown below. The increase in poverty raises in turn the pressure on the environment in a positive feedback loop: degraded and scarce natural resources, vital for impoverished communities, lead to greater levels of indigence.

Population and activity of Northeastern Argentina

In year 2001, the northeast region (NEA) totaled a population of 3,367,518 that is 9.3% of Argentina’s population. The National Institute for Statistics and Census (INDEC) has estimated that in year 2010 the population for the region attained 3,773,990, showing an increase of 11.6%. The average population density in the NEA is 14.9 people/km², with Misiones accounting for the greatest density (32.4 people/km²) and Formosa, the smallest density (6.8 people/km²).

The region’s economic activity is structured mainly around the primary sector, showing some diversification in terms of business lines. In terms of agricultural production, livestock production prevails (mainly cattle, and to a lesser extent, pigs, goats, and poultry), as well as crops (cotton, rice, yerba mate, tea, citrus, beans, soybean, sugarcane, sunflower, corn, vegetables and legumes, among others).

Within the region, 80% of the producers belong to **small-scale family agriculture**, growing over 40% of the total volume of cotton, over 60% of yerba mate, nearly 80% of goats and 20% of cattle. The region also shows important forestry activity and timber-based industry.

Another element characteristic of the region is the **presence of communities of indigenous peoples**. According to the Indigenous Community Supplementary Survey (ECPI), conducted by the INDEC between 2004 and 2005, the region is inhabited by the communities Mbyá Guaraní (Misiones), Mocoví (Chaco), Pilagá (Formosa), Tupí Guaraní (Corrientes and Misiones) Toba and Wichí (Chaco and Formosa).

Only 35-40% of small-scale agricultural producers receive support for their production, and some deficiencies persist in the technical support and funding systems aimed at diversifying and placing production to favor access to markets and potential value chains. Efforts to connect family-based agriculture with the market and processing of agricultural produce under circumstances of social inclusion and environmentally sustainable management is a key strategy for the development of the region.

NEA's social indicators summed up

The overview of social and economic vulnerability of the region is graphically displayed with the analysis of the Extended Human Development Index (EHDI). This index combines indicators relating to health, education and living conditions (income and employment) of the population. According to data for year 2002 of the UNDP, prepared using the EHDI, the NEA showed three provinces in severe or critical condition (Formosa, Corrientes and Chaco) and one province in severe condition (Misiones).

The presence of several components reinforcing poverty circumstances - education, health, and housing conditions, but also income and work - helps outline the picture for a specific region in contrast with the economic growth indexes for the entire country over the last years. This situation requires the development of integral strategies which can allow for the specificity of the region. In terms of the proposed categorization, NEA's population shows a large group of indicators more critical than the national average. Thus, its situation may be described as being of "high social and economic vulnerability".

Characterization of the Beneficiaries (type of production and production unit)

This project targets family agricultural holdings or production units found in the **mid-south region of the province of Chaco, the western region of the province of Corrientes and the northern area of the province of Santa Fe**

Province of Chaco

In Chaco the prevailing production is extensive cattle breeding and cotton growing combined with cattle livestock. The smallest producers have no more than 25 ha.

To illustrate the case of small-scale producers of the cotton core area, an analysis was conducted on producers of the Quitilipi department of the province of Chaco. Some of them are descendants of producers, others are former pickers or former foremen who decided to settle in State-owned lands. Only a third portion of them has fully vested property over the land. Such small-scale producers control up to 15 hectares of cultivated surface area oriented to the market –basically used to grow cotton. Only 14% has in place a tractor. The pieces of machinery most commonly used include moldboard

ploughs, tillers and tine harrows. A third part employs people for cotton harvesting and hoeing. Self-consumption activities occupy a significant share in the lives of these producers. Ninety-seven percent of the families have domesticated animals, eighty-one percent have farms, and seventy-four percent have orchards. Amongst the orchard products prevail corn, squash, sweet potato and mandioca. The most frequent domesticated animals are hens. Sixty-four percent have cows, although most of cattle sale is in fact self-consumption production, “regulated” by the butcher, and such cattle fulfills a role of “money box” for potential downturns. If the importance is analyzed of each different income source for such small-scale producers (taking into account monetary income and valuating income in kind), it is found that cotton production accounts for 48% of the total, self-consumption production – mainly orchard – accounts for 23%, and employment, 19%. Bearing in mind how income is composed, the stratum of small-scale producers with up to 5 hectares might be defined as “employees with land”, given that cotton production contributes 32% of their income; employment, 30%; and self-consumption production, 29%.

Northern Santa Fe

Northern Santa Fe is from the production viewpoint a typical wild-vegetation extensive livestock production area. Livestock is mainly cattle but they also breed horses, goats and sheep.

An illustrative case of the circumstances of the small-scale producers is the Vera department, located in northern Santa Fe, in the area called “Cuña Boscosa” [forest wedge]. There are no issues regarding the tenure of land, but the situation is heterogeneous when it comes to the surface area controlled, ranging from 5 to 200 hectares, due to successive land divisions, and due to the fact that upon delivery of possession of the land over to the producers, the provincial State took into account the lands’ production capability. Production is solely conducted by family labor force, and their availability of capital for machinery and infrastructure investments is scarce, stemming from subsidized loans dating back to beginnings of 1970s. Market-oriented production consists in cattle livestock with subsistence production based on the use of the orchard and the breeding of small animals (sheep, goats and hens). The average head of sheep per producer is 23, and the average head of goats is 36. A small proportion grows cotton, corn, and sorghum for sale in small surface areas, based on the promotion resulting from a project located in the area. In this area, eight production systems have been identified characterized by different combinations of four types of activities: livestock, agrarian, forestry and orchard.

Small-scale producers continue with their traditional activities (cotton, integrating new seeds and agrochemicals; the breeding of animals and domestic crops particularly used as food for the family and for working animals). Some new activities appear (particularly indoor growing of vegetables and legumes).

Province of Corrientes

In Corrientes there are small-scale tobacco, cotton and horticulture producers (the

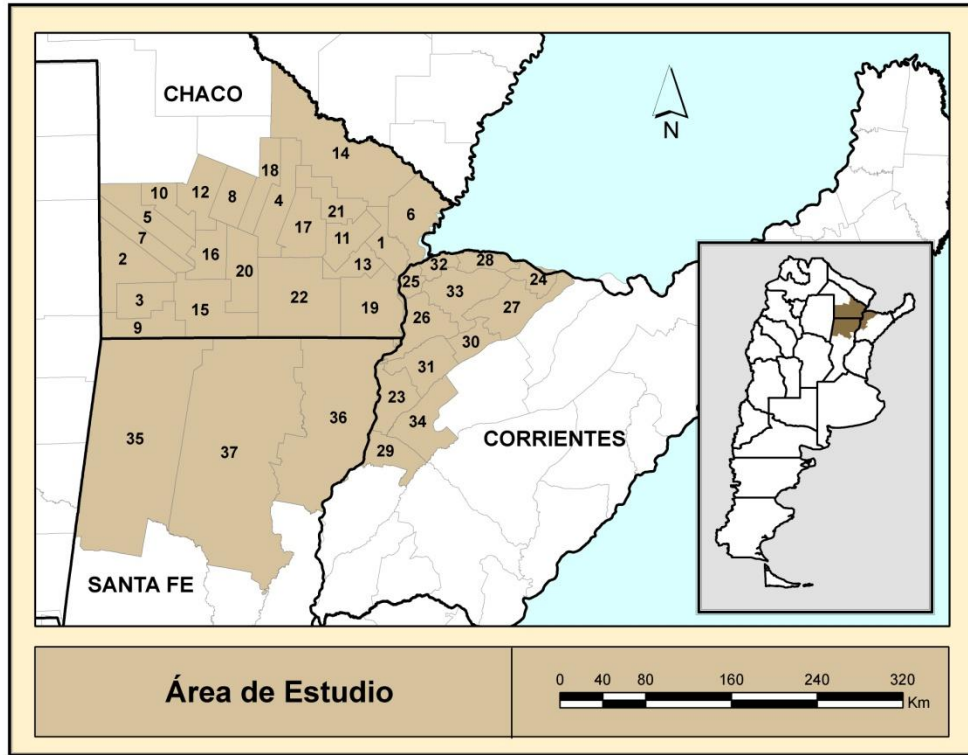
coastal strip of the Parana river) although in Goya, Lavalle and San Roque departments in this province tobacco small-scale production has declined. Small-scale producers devote mainly to the breeding of cattle, basically for self-consumption. Some of them have conducted lately horticulture production under roof oriented to the market as well as cotton. In northern Entre Rios there is a somehow greater diversification, including the growing of cereals and farming activities. On both sides of the Parana river there is a substantial demand of pickers. However, there is a significant difference in the relative weight of permanent family work, which is greater in the humid Chaco.

To illustrate the type of small-scale producer of the province of Corrientes, a characterization can be used performed by a project of the Coordination Unit of Plans and Projects for Small-Scale, Small-Landholding Producers prepared by the National Institute of Agricultural Technology – INTA – located in the Esquina department and south of Goya department. In this area, cattle and sheep livestock for breeding cover over 80% of the surface area. The surface area devoted to agriculture does not exceed 5% of the total surface area, although is conducted by approximately 70% of the producers. As regards the agricultural production units of the area, 80% has up to 15 ha. Producers, half of which are owners of the land while the other half includes occupants and sharecroppers, use no more than 5 hectares. And the sale-oriented production base is tobacco and cotton. Labor force is family-derived in all cases. However, in some cases temporary workers are hired for hoeing and harvesting.

The project identifies three production systems, stating however that in all cases vegetables/legumes or corn are grown for self-consumption.

Description of the area of Intervention

This area of study belongs, to a large extent, to the Humid Chaco region described in *“LAS EXPLOTACIONES AGROPECUARIAS FAMILIARES EN LA REPUBLICA ARGENTINA. Un análisis a partir de los datos del Censo Agropecuario del 2002”* [“Family Agricultural Production Units in Argentina. An analysis based on data from the 2002 Agricultural Census], written by Edith Scheinkerman de Obschatko (Agreement MAGyP-IICA). For such reason, the indicators mentioned next apply to this area.



PROVINCE	DEPARTMENT	MAP	AREA	POPULATION		
				Total	UBN	%
CHACO	1 DE MAYO	1	129975	9130	2643	28,9
CHACO	12 DE OCTUBRE	2	289681	20105	7765	38,6
CHACO	2 DE ABRIL	3	152522	7418	2757	37,2
CHACO	25 DE MAYO	4	234769	28006	12886	46,0
CHACO	9 DE JULIO	5	219599	26878	9859	36,7
CHACO	BERMEJO	6	273848	24116	8228	34,1
CHACO	CHACABUCO	7	155585	27664	7915	28,6
CHACO	COMANDANTE FERNANDEZ	8	150285	87158	24969	28,6
CHACO	FRAY JUSTO SANTA MARIA DE ORO	9	181150	10419	4137	39,7
CHACO	GRAL BELGRANO	10	131098	10457	4933	47,2
CHACO	GRAL DONOVAN	11	154567	13341	4752	35,6
CHACO	INDEPENDENCIA	12	193244	20574	10014	48,7
CHACO	LIBERTAD	13	101850	10767	3135	29,1
CHACO	LIBERTADOR GRAL SAN MARTIN	14	739906	54288	24152	44,5
CHACO	MAYOR LUIS J FONTANA	15	331894	53341	17540	32,9
CHACO	O'HIGGINS	16	156838	19207	9143	47,6
CHACO	PRESIDENTE DE LA PLAZA	17	222751	12183	4502	37,0
CHACO	QUITILIPÍ	18	160737	32017	12555	39,2
CHACO	SAN FERNANDO	19	344134	362726	79329	21,9
CHACO	SAN LORENZO	20	217393	14234	6449	45,3
CHACO	SARGENTO CABRAL	21	160900	14989	6072	40,5
CHACO	TAPENAGA	22	549720	4180	1798	43,0
CORRIENTES	BELLA VISTA	23	178915	35231	10901	30,9
CORRIENTES	BERON DE ASTRADA	24	89289	2290	946	41,3
CORRIENTES	CAPITAL	25	59765	326765	69228	21,2
CORRIENTES	EMPEDRADO	26	205477	14657	5402	36,9
CORRIENTES	GRAL PAZ	27	259018	14720	5433	36,9
CORRIENTES	ITATI	28	85760	8717	2473	28,4
CORRIENTES	LAVALLE	29	148400	26206	10358	39,5
CORRIENTES	MBURUCUYA	30	99387	8970	3585	40,0
CORRIENTES	SALADAS	31	192210	21435	8721	40,7
CORRIENTES	SAN COSME	32	60732	13099	4034	30,8
CORRIENTES	SAN LUIS DEL PALMAR	33	259691	16456	6193	37,6
CORRIENTES	SAN ROQUE	34	245084	17911	7487	41,8
SANTA FE	9 DE JULIO	35	1733258	28189	8758	31,1
SANTA FE	GRAL OBLIGADO	36	1103838	165767	43836	26,4
SANTA FE	VERA	37	2070325	50881	16333	32,1

Table: Surface area per district, total population and population with Unsatisfied Basic Needs.

According to Scheinkerman de Obschatko (2009:10-19), a family-based agricultural production unit (or family EAP in Spanish) means those places where direct work of the producer and the existence of family work can be verified but it can also extend to include the possibility of hiring up to two remunerated workers on a permanent basis.

The typology may be thus established with the characteristics outlined below:

- Family-based producers Class “A”: no tractor of their own, less than fifty animal units, less than two irrigated hectares, no fruit growing neither cultivation under roof.
- Family-based producers Class “B”: small-scale, semi-capitalized producer, with tractors of 15 years old or more, between 51 and 100 animal units, two to five irrigated hectares or up to half an hectare with fruit trees.
- Family-based producers Class “C”: small-scale, capitalized producer, with tractors of less than 15 years of age; or more than one hundred animal units, or more than five irrigated hectares or more than half an hectare planted with fruit trees
- Family-based producers Class “D”: family-based producer with one or two permanent, remunerated, non-family workers.

In the Humid Chaco region in year 2002 there were 33,318 EAP (agricultural production unit). Out of the above, 26,134 were family production units (78.4%). Such family-based EAPs covered a surface area of roughly 4 million Ha.

The distribution of family-based EAPs according to type for the Humid Chaco area was: 42.8% Class A, 24.8% Class B, 20% Class C, 12.4% Class D.

The land tenure system of family-based production units of the Humid Chaco turned out to be mainly private property (70.5% of the surface area). Approximately 10% is operated by tenants, whether in privately-held lands or state-owned lands. In this region, the average surface area of the different classes of family-based EAPs is 47.5 Ha for Class A, 137 Ha for Class B, 299 Ha for Class C and 306 Ha for Class D.

Family-based agricultural production units in this region have a remarkable share in the region’s agricultural production, for example, 82% of the EAPs growing vegetables and legumes and 64% of EAPs growing cotton are family-based production units.

Livestock production systems of the N and NW regions of Corrientes conduct breeding and rebreeding activities of cattle. From 60% to 80% of EAPs have less than 100 head of cattle. The production of calves is little efficient, with a percentage of weaning out of 47%, basically on account of climate conditions affecting forage production.

Livestock breeding systems prevail in northern Santa Fe although most of the EAPs have between 100 and 250 heads of cattle.

However, the entire region shows similar characteristics in terms of low-efficiency calves production, forage deficit caused by recurring droughts, low application of drive handling technology.

The processing of the data provided by the Agricultural National Census of 2002 with such definition adopted allows to assert that in such year 251,116 family EAPs were recorded across the country (accounting for 75.5% of all the EAPs), all together covering a surface area of 30.9 million hectares (17.7% of all the production surface area occupied by EAPs). In this scenario, it is important to stress the fact that family EAPs comprise a clear majority in Argentina's northeast, reaching **92% of total EAPs**.

As regards population density, it is observed that, save for the districts where the capital cities of Corrientes and Chaco are located, the geographic area which this project seeks to cover pertains to a **rural area in its broad sense**.

If we take into consideration unsatisfied basic needs, we may notice that in the rural districts¹ related to the geographic area of the project this indicator ranges between 26.4% (General Obligado, Corrientes) and 47.6% (O'Higgins, Chaco), thereby reflecting a clear homogeneity in terms of social vulnerability indicators.

As regards the production characteristics of the geographic area of intervention, the region of the humid Chaco has been historically characterized by the growing of cotton – mainly in the province of Chaco – and by the numerous presence of family producers, but including also activities such as timber extraction, the growing of sunflowers and the breeding of cattle (with goats and sheep livestock being also found).

The variations between Chaco and Santa Fe in terms of production used to be mainly related to different emphasis placed on productivity and on orientations within such sector. However, a succession of **production crisis and transformations** has brought about deep changes both socially (degradation and/or disappearance of vast layers of those family producers) and economically (dramatic technological reduction and restructuring of cotton, and deforestation and expansion of grain crops, especially soybeans). Anyway, the traditional model may still be found in persistent small-scale producers and/or in new cotton production EAPs or large farming units.

In Corrientes there are horticulture producers and growers of different plant and animal species for self-consumption, particularly towards the west of the province, in light of the reduction or disappearance of some traditional activities. The region's agrarian social structure is based on the joint existence – not necessarily functional – of family units and large production units.

In the districts of northern Santa Fe, that is both in 9 de Julio and in Vera, the prevailing production activity is cattle breeding, extensive agriculture, particularly cotton and soybean, and the extraction of timber and firewood out of "quebracho" and Carob trees in the "forest wedge", whereas in General Obligado extensive agriculture, particularly soybean and sunflower growing, prevails, as does also open-field horticulture and livestock production mostly in the alluvial valley and islands of the Parana river.

¹ The districts of San Fernando (Chaco) and Capital (Corrientes) are not taken into account since the population density accounts for city environment.

As regards matters of gender, the number of men in relation with the number of women is higher in the rural population, and this is the case also for the entire country. In most provinces, including those mentioned in this report, **the rural women population does not exceed 48%**.

As far as the activities performed by women are concerned, these activities are related to self-consumption needs, income generation (on-farm activities, processing and marketing of products and off-farm work), as well as upbringing and care of the family production unit (education, transmission of values and traditions, feeding, organization and maintenance of the household). It is worth mentioning that these chores in general are not remunerated, accounted for or even perceived as productive work, even by the women themselves. In this way, working days of rural women, all activities considered average 16-18 hours a day.

Lastly, in the area of intervention of this project we found the presence of **indigenous communities of Mocovíes, Tobas and Wichi**, which, by year 2005, amounted to approximately 90,000 members.

As regards educational characteristics of these communities, the illiteracy rate for indigenous population of 10 years of age or more is of 9.1%. That is three and a half times more than the national rate (2.6%). Another piece of information to bear in mind is that 78.2% of the indigenous population of fifteen years of age or more have attained as maximum schooling level that of incomplete secondary school, whereas a third portion has not completed primary school or has received no schooling at all.

Lastly, major production activities of indigenous communities of the area of intervention of this project are fishing, collection of fruit and honey, gathering of firewood, hunting of small animals, crafts, seasonal jobs and/or salaried employment, state-funded work and domestic and community agriculture. Of all these activities, only community agriculture is conducted in the same place where they live.

Climate and seasonal variability

The region features a strong seasonal nature, increasing from east to west, as shown in the following table. Towards the east, precipitation for the summer accounts for approximately 30% of the total annual value, whereas towards the west, it accounts for more than 40%. As from longitude 60°W, towards the west, climate is more and more of a Mediterranean type, with a conspicuous dry season in the winter.

Water availability throughout the year is strongly dependent on summer rainfall, specially to the west of the area. This fact, added to the great inter-annual variability of the summer rainfall, raises the vulnerability of the system. The following chart shows some statistics pertaining to summer precipitation (December, January and February) for the 1961-2011 period. In some meteorological stations in the NEA, it can be observed that the standard deviation, which defines the range of “normal” rains, is 30% higher than the mean value, reaching almost a 50% increase in Ceres. This shows that the summer precipitations are 30-50% above or below of the mean value, highlighting the strong oscillations that are characteristic of the area.

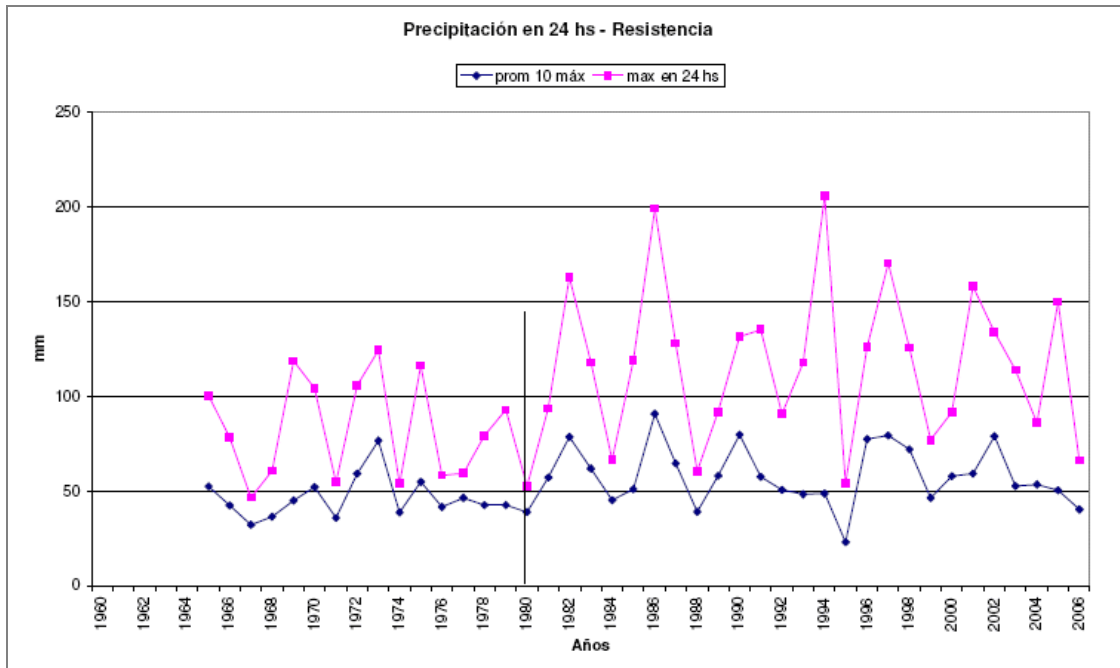
SUMMER PRECIPITATION (DECEMBER – JANUARY – FEBRUARY) ²						
	MINIMUM (mm)	MEDIAN (mm)	MAXIMUM (mm)	RANGE (mm)	STANDARD DEVIATION (mm)	STANDARD DEVIATION (%)
SÁENZ PEÑA	160	428	816	656	131	30.6%
RESISTENCIA	242	452	971	729	148	32.7%
MONTE CASEROS	107	437	937	830	173	39.5%
FORMOSA	167	440	1251	1084	181	41.1%
RECONQUISTA	163	394	833	670	167	42.3%
SANTIAGO DEL ESTERO	46	324	901	855	137	42.4%
CERES	128	357	1075	947	169	47.4%

Changes observed at a local scale

Precipitation

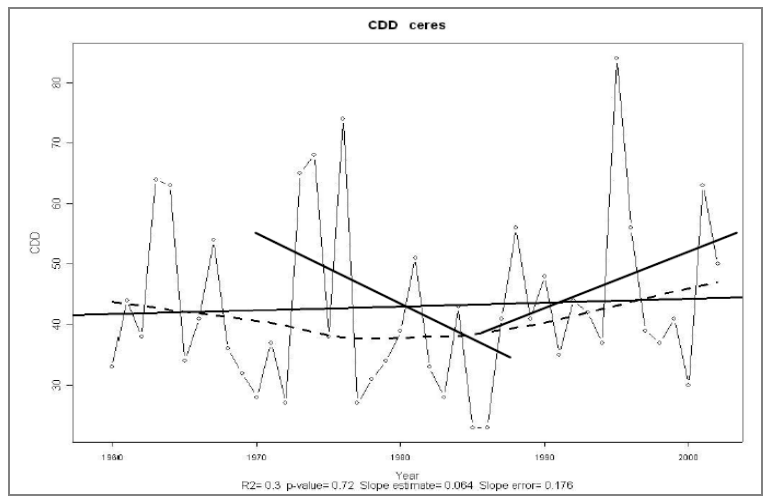
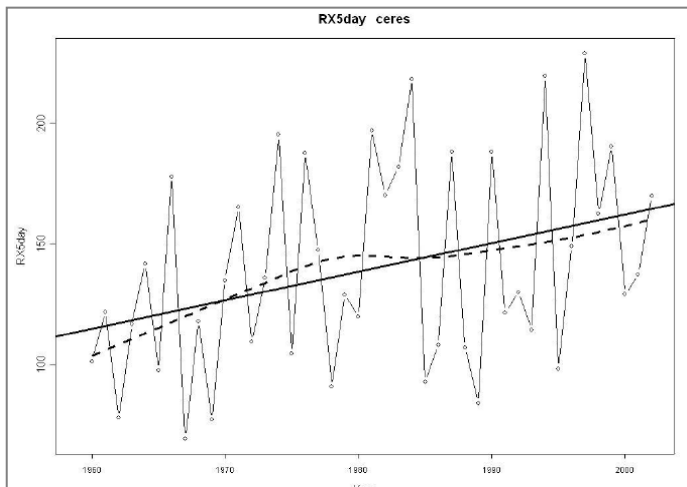
There is evidence to the fact that storms - though increasingly lesser in terms of spatial coverage - have been more intense locally over the last years. The following graph (Marino 2007) shows the increase recorded in Resistencia (Chaco) in the maximum amount of rainfall for 24 hours recorded each year. Only after 1980 there appear values in excess of 150 mm in one day.

²The data with which calculations were performed were provided by the National Meteorological Office (SMN).



The charts below pertain to a different time scale. The chart on the left shows maximum precipitation accumulated during 5 running days at the meteorological station of Ceres. According to this chart, this parameter has shown a progressive increase. However, even if the rainfall accumulated over 24 hours, in 5 days or even throughout a year, shows a positive tendency, this does not mean that fewer dry periods are found in the area.

In the chart on the right, the duration of the greatest period without precipitation each year is plotted. No decrease was found in the number of running days without rain for the area, despite the increase in the total annual and summer amounts.



Marino, M. (2007) Variability of precipitation in Argentina across different time scales, related to convective activity found. Doctoral Dissertation, UBA.

Argentina's northeast is one of the areas of the planet where the change of annual mean precipitation – and resulting discharge of large rivers – has been most noticeable, during the 20th century.

In addition, the frequency of extreme precipitation (more than 100 mm/day) has risen and the relevant inter-annual variability has also been found to rise. Likewise, from the 1960s, El Niño-Southern Oscillation events have been more frequent and intense (specially those of 1982/83; 1991/92 and 1997/98). The NEA region is one of the regions in Argentina more clearly connected to ENSO events. (Vargas, et al, 1999; Boulanger et al, 2005).

Such extreme rainfall has shown changes over the last decades, its magnitude being tied up to the seasons of the year. The greatest changes in the NEA were found to occur in autumn. The 1980-1996 period showed an increase in extreme rainfall by more than 10% if compared with the 1961-1975 period (Penalba y Robledo, 2010).

Furthermore, since mid-1960s, mean annual discharge for the Del Plata basin has also risen. Since then, flash floods have been more intense, and low-flow periods have been more extreme, specially in the Parana river.

Increases in mean discharge have been of about 30% in almost every river, except for river Salado, which showed a 189% increase. So high a value may be explained by human intervention at the lower basin, over the last 3 decades, which has turned farming and wild vegetation areas into agricultural lands and numerous drainage channels have been built.

Discharge has increased proportionally more than precipitation. This amplified hydrologic response in relation with rain is typical of humid regions with low surface gradient, which is the prevailing case for the region.

Temperature

As regards mean annual temperature, no homogeneous pattern can be pinpointed as it was the case with precipitation, although the tendency has been positive, particularly after 1970-1971. A regional increase has also been found in mean minimum and maximum temperatures since 1930. It is worth mentioning that the records available for the analysis are scarce (10 stations in all).

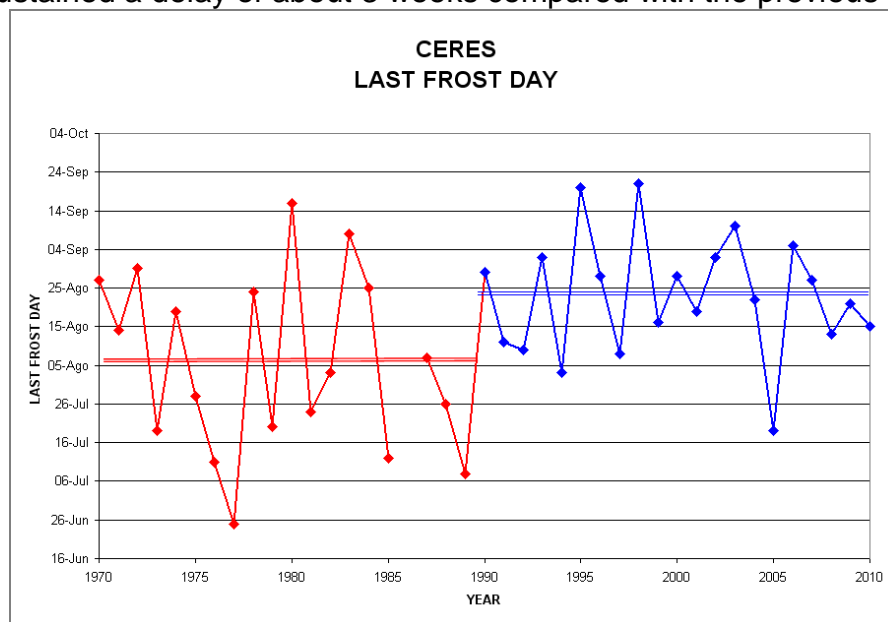
The greatest social-economic impacts are due to climatic extremes rather than to progressive changes in the mean values of climate variables. No remarkable changes have been found to occur over the last years in Argentina's northeast in the mean values of temperature. However, changes have indeed been found for extreme values.

From the study of extreme daily temperatures, it is observed that maximum and minimum temperatures present a differential pattern. Particularly, it was found that

mean monthly values of minimum temperature have increased for the stations under study, although this increase has not been uniform between months. May and July do not show any significant tendencies, and even present negative tendencies in some stations, from year 1958 onwards. (Barrucand 2008). In contrast, mean monthly maximum temperatures have dramatically diminished in some stations, leading to a decrease in daily thermal amplitude.

Despite the slight increase in mean temperature, it is shown that the period without frost has decreased over the last years.

The shrinkage of the period without frost occurrence is due mainly to the delay of the average date with the last frost. The next chart shows the displacement of the date of the last frost in Ceres (northwest of the province of Santa Fe), which over the last 20 years has sustained a delay of about 3 weeks compared with the previous period.



However, extreme daily minimum temperatures have significantly risen, showing a decrease in the cases with cold temperatures (known as cold nights) and an increase in high minimum temperatures (warm nights) (Rusticucci y Barrucand, 2004).

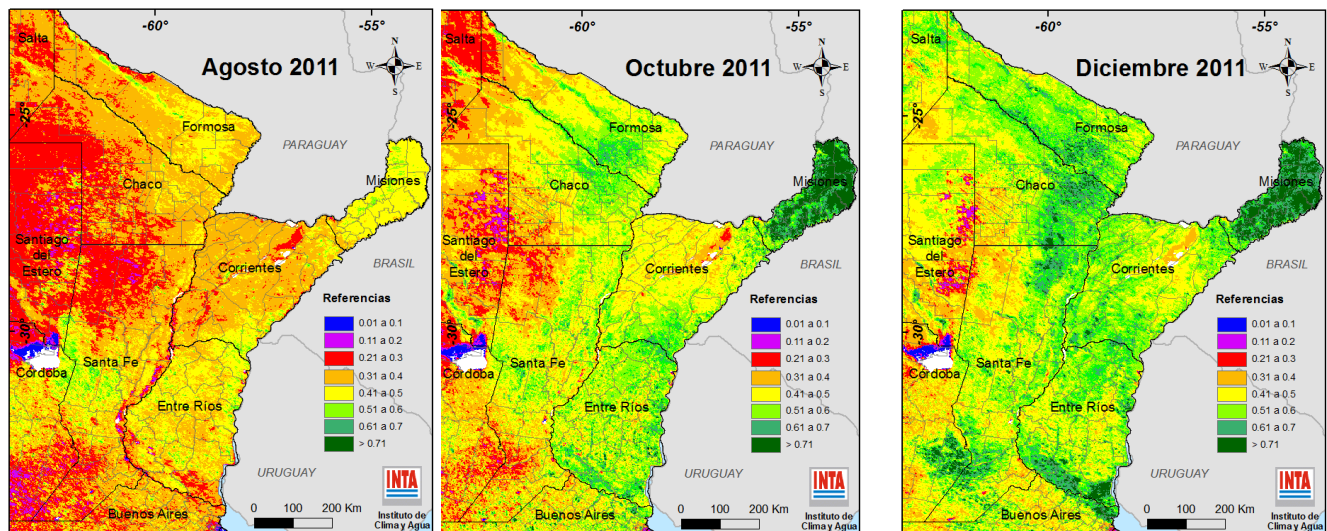
This applies to all months of the year, except in July and, with more intensity, in the summer, which mostly shows itself in the greater frequency of heat waves. Heat waves are defined here as the sequence of at least three running days above the 90th percentile, in the warm period of the year, that is between October and March. During the 1981-90 decade, a temporary increase was sustained in terms of number of days with heat waves, in the NEA this being of about 40 days per decade.

Not only are heat waves highly related to human and animal mortality, but its negative influence has also been studied upon agricultural and farming productivity.

Maximum temperatures have also shown changes for this town, with a decrease in the number of days with temperature in excess of 35°C. Over the last 20 years, 380 days were recorded with such characteristics, whereas during the 20 previous years, this figure was of 450 days. Anyway, the variability of this last 20-year period has been extremely high, with one year where 35°C temperature was never attained (1991) and with another year where 43 days were recorded with temperatures in excess of the former value (2008).

Vegetation Index

Remote sensing technology can be used to characterize the seasonal and inter-annual dynamics of vegetation communities. Time series analysis of the National Oceanic and Atmospheric Administration's (NOAA) Advanced Very High Resolution Radiometer (AVHRR) 1-km multispectral imagery have shown changes in seasonally-dependent biophysical variables such as leaf area index (LAI), biomass, and net primary productivity. Time-integrated normalized difference vegetation index (NDVI) data revealed that spatial and temporal variability during the growing season is correlated with precipitation and other variables that are important controls on pastures, grassland and crops performance and productivity in the area of interest. This analysis is supported by several research studies that concluded that NDVI is strongly related to precipitation.

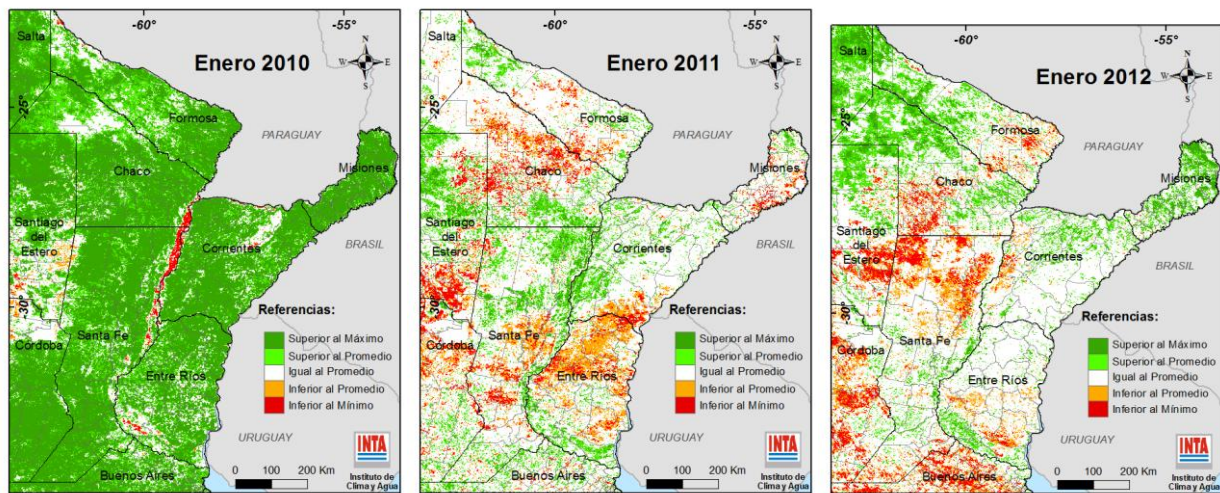


INTA Climate and Water Institute (2012), NDVI variability across the area of interest. Pixels in red show a weak vegetation response, green colors growing vegetation.

Vegetation indexes (NDVI) help follow the condition every week or month period and shows the great variability of the vegetation photosynthetically active across different time scales throughout different times of the same year. The monthly analysis of such indexes show great variability found in this region within similar growing seasons, and

between years. This variable behaviour is directly connected to variation in water availability.

The analysis of the comparative NDVI of the last three summers is a example of this great interannual variability. The figures show in red color pixels that means a vegetation index value less than the minimum of the NDVI time series of the last 15 years, orange means a value less than average of the time series. Green colors means better than the average.

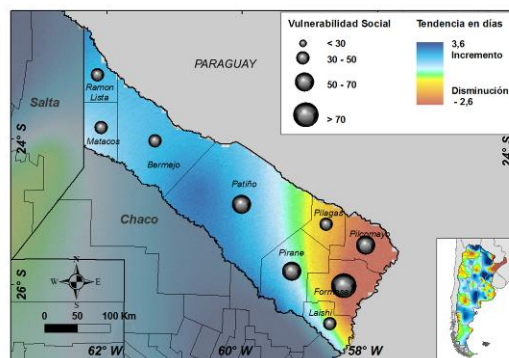
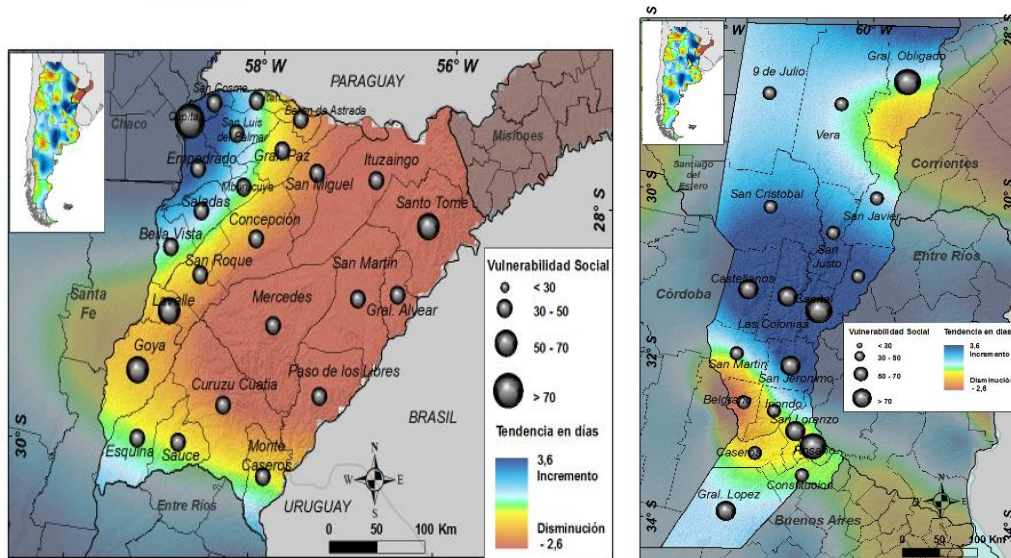
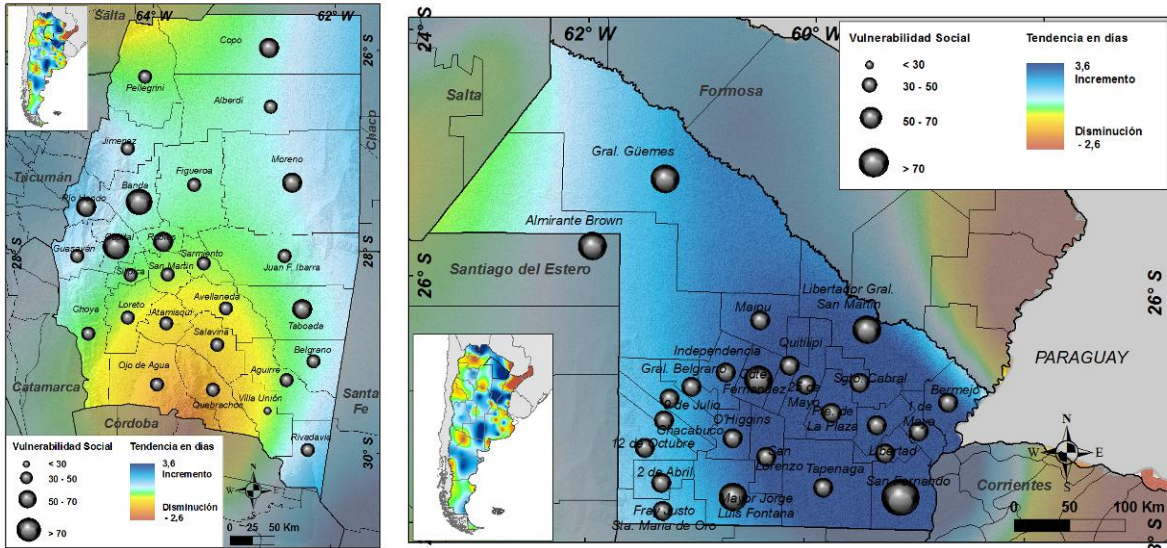


INTA Climate and Water Institute (2012), Comparative NDVI of the last three year during January, summer season, as a demonstration of the climate variability and change of this area during recent years.

Combined vulnerability

Adopting as reference models developed by the Research Centre of the Seas and the Atmosphere of the University of Buenos Aires (CIMA - UBA) when implementing the project of the Second National Communication previously described, a drill was executed to determine the general vulnerability. **Social indicators, such as Unsatisfied Basic Needs (NBI) of the region was combined with impact models, as well as with tendencies observed** during the last 50 years at official stations of extreme climate values, such as days with frost, days with warm nights, precipitations above the 95% percentile (very humid days) and consecutive days without rain (dry days), among others. Such guiding indexes for the observation of tendencies have been defined by the CLIVAR project (www.clivar.org) and serve as tools to analyse tendencies and to apply adaptation measures in the face of climate change.

The analysis of social indicators from the National Census together with impact models and past and present climate trends in this area provides useful information of the exposure of the different districts to climate risks originated in climate variability and change, as well extreme climate event.



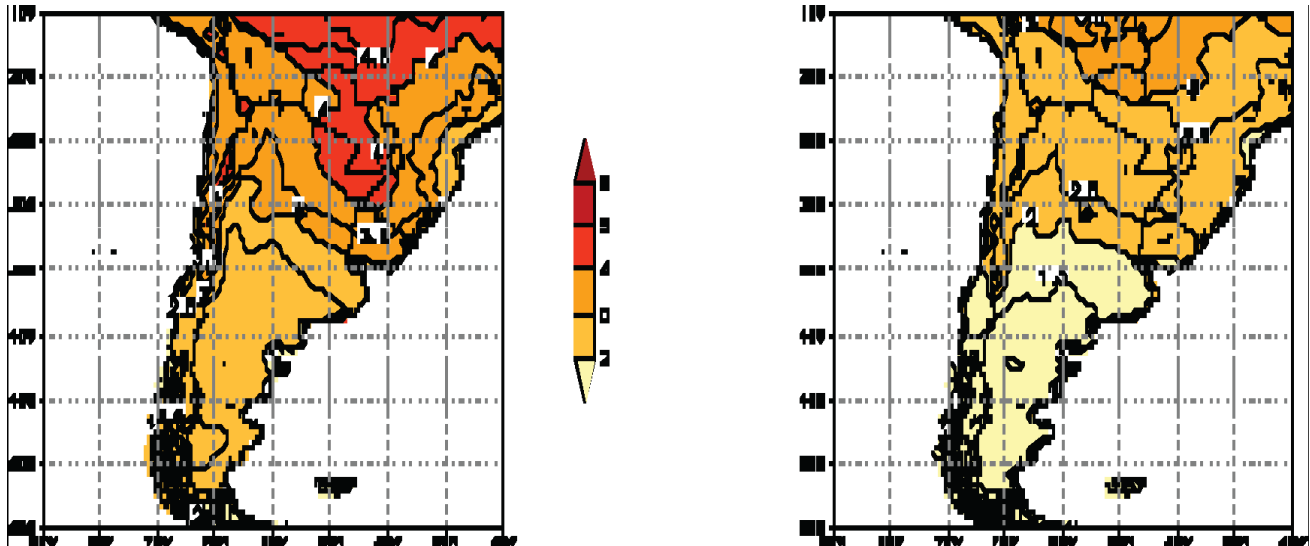
INTA & DCC SAYDS (2012), Combined analysis of social indicators (circles meaning social vulnerability of the district), superimposed on the colored maps related to very humid days (trend in precipitations above the 95% percentile) meaning the blue areas an increase in the very humid days.

Projected climate changes

The Second National Communication (SNC) of the Republic of Argentina to the United Nations Framework Convention on Climate Change (UNFCCC) from 2007 provides the latest official climate scenarios available for Argentina. Focused on the period 2080-2090, they project increases in mean and extreme temperatures and changing precipitation patterns. These effects will have diverse impacts on regions, communities and economic sectors, but there are considerable underlying scientific uncertainties related with their magnitude and timing. Although projections for 2080-2090 are uncertain, they can be useful for shorter-term adaptation planning. In the case of temperature, both A2 and B2 scenarios of the Intergovernmental Panel on Climate Change (IPCC)³ have a clear warming trend that is more pronounced in the north; more than 4 °C in the A2 scenario.

Projected changes in the annual mean temperature (°C) in 2080/2090 compared with 1980/1990 based on the MMC-CIMA regional model. The graphic at left is from the IPCC A2 scenario, and the graphic at right from the IPCC B2 scenario.

³ The A2 family of scenarios is characterized by: (i) world of independently operating, self-reliant nations; (ii) continuously increasing population; and (iii) regionally oriented economic development. The more ecologically friendly B2 scenarios are characterized by: (i) continuously increasing population, but at a slower rate than in A2; (ii) emphasis on local rather than global solutions to economic, social and environmental stability; (iii) intermediate levels of economic development; and (iv) less rapid and more fragmented technological change than in A1 and B1.



According to the available climate scenarios developed with the regional MM5-CIMA high resolution model for the 21st century⁴, a considerable temperature increase is expected for the whole Argentine territory. The IPCC A2 scenario projects more than 4°C temperature increase in the north of the country.

These increases, added to the warming already experienced during the 20th Century of approximately 1°C, are expected to have negative effects on several natural systems such as the generalized retreat of glaciers and higher evapo-transpiration in most areas.

These effects would in turn impact water availability and consequently increase the risk of water deficits for agricultural production. For the North and central parts of the country, the SNC's forecasts indicate that increases are expected also in terms of maximum temperatures accompanied by a concentration of the rainfall regime.

However, the mean rainfall levels are expected to stay approximately at their current levels. All this is expected to result in increased aridity and an intensification of the desertification processes affecting agriculture. Furthermore, since increased droughts are forecast for the winter season, it is expected that cattle ranching would be especially impacted⁵

⁴ To prepare for the SNC, CIMA researchers validated global climate models used in the Third Report of the IPCC in southern South America, and found that the HadCM3 global model developed by the Hadley Centre in the UK was one of the best models to represent climate (temperature, sea level pressure and precipitation) in southern South America. Consequently, the MM5-CIMA model was nested in the Hadley Centre HadCM3 model scenarios for the period 2080/2090, and using different IPCC scenarios it served the SNC in 2007.

⁵ Scenario A1B (2020-2040) described in the Second National Communication on Climate Change in Argentina: <http://www.ambiente.gov.ar/?idarticulo=1124>

For the project intervention area, researchers from *Universidad Nacional del Litoral* worked with the limited area model of CIMA-UBA, analysing IPCC's scenarios A2 and B2 and adopting as reference the 1981-90 period.

Considering scenario A2, the CIMA model projects a decrease in precipitation by 2081-90 in Corrientes, south and centre of Misiones, east of Formosa and Chaco (and also north of Santa Fe and northeast of Entre Rios). Such reductions would go from -200 mm (the most noticeable in Corrientes) to -100 mm. For Chaco this model foresees a change that goes from 0 to 120 mm, that is to say, rainfall might be the same than for the decade of reference (1981-90) or less.

For the rest of the region: north of Misiones, west of Formosa and Chaco (also centre and south of Santa Fe and Entre Rios), it is expected that annual rain will rise. The increase would be of about 70 mm in the west of Formosa. The reduction of rainfall would be most noticeable in the summer whereas the increase would be more dramatic in the autumn.

Considering scenario B2, changes are less noticeable and the reduction of annual precipitation is limited to Corrientes (with a maximum decrease of 100 mm/year), the eastern half of Chaco and the north and northeast of Santa Fe. The rest of the region would experience an increase that would reach 100 mm in the south of Santa Fe and a little bit over 120 mm in the east of Misiones.

The picture becomes more complex and variable if we consider monthly rainfall calculated for the 2081-90 models and we compare those with the 1981-90 period. Between January and May, precipitation would increase as compared with the 1981-90 period, in average, for the entire region, in both scenarios. From June to November, the tendency shows a decrease in precipitation as compared with 1981-90 values.

Scenario B2 in general slightly exceeds scenario A2 in the figures of monthly precipitation, except for May and November. However, if we consider annual precipitation, changes are greater in scenario A2 than in scenario B2.

In other words, **the change in projected precipitation shows spatial variability and also seasonal differences**. Not only does the magnitude of the changes differ comparing scenarios A2 and B2 but also, in some territories, such changes do not even always share the same sign.

The water balance projected for 2081-90, using the CIMA-UBA model and scenario A2, shows that virtually the entire region would continue to have water deficit with an increasing gradient towards the northwest. In today's situation, the sectors with water deficit are constrained to the west of Chaco and Formosa, the latter having the higher deficit (250 mm/year), whereas in scenario A2 still the sectors located in the centre and east of the region also feature deficit, specially during the spring-summer months. This deficit would reach maximum values in Formosa (up to 960 mm/year to the west, 400 mm/year to the east) and Chaco (up to 650 mm/year to the west and 280 mm/year to the east) and would also be high in Misiones (250 mm/year) and Corrientes (330 mm/year).

In scenario B2, similar tendencies are observed as in A2 but with differences more subtle as regards the period of reference.

In other words, should changes in temperature and precipitation come about as shown by model CIMA-UBA, **water deficit would rise significantly in the NEA**. A lesser groundwater recharge together with an increase of water demand would diminish the recharge of the aquifers, and it would become necessary to increase water supply during spring and summer months for irrigation purposes.

An **increase in the frequency and intensity of floods of fluvial origin is expected to occur** (this situation would be more critical in scenario A2 than in scenario B2). Besides, the frequency and intensity of El Niño phenomenon would continue to grow due to global warming. As a result, today's risk levels related to floods of fluvial origin would go up in scenarios A2 and B2.

In addition, floods originated in rainfall would also rise because the frequency and intensity of the meso-scale convective system on account of climate change is expected to continue rising (since 1970s).

It is worth mentioning that the agricultural expansion brought about a dramatic reduction of natural coverage over the last century. The most critical case is that of the Atlantic Forest, which ecosystem has gone down from 85% to 5% in the state of Parana (Brazil). Soils in the Del Plata basin converted to agriculture feature compaction and water erosion processes. As a result, surface run-off towards receiving bodies of water and peak discharge has grown and sped-up, with a reduction of time of concentration. Changes in land uses, among many other factors, will contribute to an increase in the flooding risk, both fluvial and pluvial in origin.

■ PROJECT / PROGRAMME OBJECTIVES:

List the main objectives of the project/programme.

The main objective of the project is to increase the adaptive capacity and to build resilience of small-scale family agricultural producers in the face of climate change and climate variability impacts, particularly those deriving from the increase in the intensity of hydrometeorological events, such as floods and droughts.

The specific objectives of the project are:

1. To enhance the resilience of small-scale agricultural producers from the Northeast in light of climate change and variability.
2. To strengthen hydrometeorological and agro-production monitoring systems to improve the institutional capacity of assessing, and planning for, climate change impacts in the agricultural subsistence systems.

3. To enhance institutional capacity, both at national and provincial/local level, for decision making and management of the implementation of adaptation measures and actions to address climate change and variability in northern Argentina.

■ PROJECT / PROGRAMME COMPONENTS AND FINANCING:

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

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

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US\$)
1. Improvement of the capacity of adaptation to climate change and variability of small-scale family producers of North-eastern Argentina	1.1 Optimisation practices of agricultural, farming, and forestry production management in each one of the areas of intervention	Increase in agricultural production of small-scale family producers and reduction of economic and social vulnerability in the face of climate change and variability.	500,000
	1.2. Implementation of a system for the management and transfer of risks targeting small- and mid-scale agricultural producers Development of two pilot tests in the region selected		1,250,000
	1.3 Implementation of improvements in the efficient use, catchment, harvesting, and storage of water in the areas of intervention	Reducing the variability in income inflow of family agricultural producers, promoting their continuity in the activity and in rural settings. Improvements in the use and productivity of water for family agricultural producers.	1,250,000
2. Strengthening of information, monitoring and climate information management systems	2.1 Integration and expansion of the NEA's agro-hydrometeorological networks.	The improvement and enhancement of the capacity of monitoring and evaluating climate change and variability will allow to set up the most convenient adaptive measures for the	600,000

	<i>2.2 Development of an integrated Early Warning and Decision-making system to assess and manage climate risks, including extreme events</i>	resilience of the local production systems Systematized and freely available basic information for effective decision making regarding adaptation of producers to adverse conditions, and for local and regional planning.	800,000
3. Generation of local and regional capabilities on the impact of climate change and variability and implementation of adaptation measures	3.1 Development of training and communication modules on risk management and transfer for governmental technical experts and small-scale agricultural producers	Municipal and provincial governmental units, educational settings, and producers of family agriculture with capabilities to generate appropriate adaptive interventions.	150,000
	3.2 Training and formation addressed to municipal and provincial governmental units for hydrometeorological management and monitoring, analysis of climate information, use of methodological tools and development of modules of adaptation		200,000
4. Project/Programme Execution cost			450,000
5. Total Project/Programme Cost			5,200,000
6. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			440,000
Amount of Financing Requested (CAR2&3)			5,640,000

6. Project Cycle Management Fee charged by the Implementing Entity (if applicable)	440,000
Amount of Financing Requested	5,640,000

PROJECTED CALENDAR:

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

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	March 2013

Mid-term Review (if planned)	December 2014
Project/Programme Closing	June 2016
Terminal Evaluation	December 2016

PART II: PROJECT / PROGRAMME JUSTIFICATION

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

The project will contribute to the furthering the implementation of adaptation strategies and measures to address climate change taking as main beneficiaries small-scale family producers with the greatest vulnerability of the entire country. To achieve this progress in the implementation of this proposal, an inter-institutional approach will be taken as model, which will further integral management, and which above all will set forth the appropriate channels to enable an active participation of all key stakeholders, including the project's beneficiaries during the entire cycle of implementation.

To such end, the above shall comprise three main components and relevant sub-components, as follows:

Component 1: Increase of the adaptation capacity of small-scale producers of the NEA to address climate change and climate variability.

This is the main component of the project, aimed at a direct intervention on agricultural and farming production practices, optimising management of water and forestry resources, as well as planning and sustainable management of such resources in a way that will enable to maximize the results of risk management practices of small-scale family producers in the areas of intervention. Its purpose is to enhance the decision making capability regarding any possible measures of adaptation by the producers and thus contribute to the economic and social sustainability of family agriculture of the region. It is based on the generation of participatory channels for an optimum design and implementation thereof.

The adoption of a participatory approach is an essential part of the rationale behind the project since such approach will see to: a) satisfy the needs and demands of the target

population, b) strengthen the beneficiaries in their actions as a group and as individuals through the specific practice of preparing and implementing their own projects and, c) increase participation of the beneficiaries in the several stages of any project – in the decision-making, in the follow-up, and evaluation – in such a way that transparency, fairness and actual implementation of the project can be ensured.

The Argentine Republic is developing a third stage of province-wide investments for the agricultural sector in order to reduce rural poverty (the overall cost is estimated to be US\$ 115,000,000). Such investments accompany this adaptation project. Consequently, in terms of production development and competitiveness of family-based agriculture and vulnerable rural groups aiming at their social and economic insertion into the markets and value chains, Argentina has been developing projects to such effect since 1984. Programs and projects are co-funded, either in full or in part, with external resources deriving from loan agreements: Rural Development Project of Patagonia (PRODERPA) funded by the IFAD, Rural Areas Development Program (PRODEAR) – IFAD, Rural Development Project in Northwestern Argentina (PRODERNOA) – IFAD and the Development Project of Agricultural Small-scale Producers (PROINDER) funded by the World Bank. Despite Argentina's economic growth over the last eight years, 32 % of rural inhabitants (more than one million people) live in poverty conditions. The adaptation project will be supplemented with PRODEAR's activities, since PRODEAR serves the northeastern provinces.

The general purpose of the programs and projects is in line with Argentina's National Agri-food Plan, which is to increase income and the assets of the rural poor population.

During the preparation of the final proposal (full-size Project) the project's participatory management mechanisms shall be provided for the complete engagement of the beneficiaries throughout the full cycle.

Output 1.1 Optimisation practices of agricultural, farming and forestry production management in each one of the areas of intervention

Production management practices must accommodate any variations and changes to the volumes and frequency of precipitation and temperature, and to any seasonal climate patterns which will influence the production systems.

According to information available, the increase in the spring-summer rainfall and the increase in rain intensity over the last 20 years causes flooding situations on the one hand, and longer time periods between rains, which in turns brings about more frequent water deficits.

This increase in rainfall favors the expansion of the agricultural frontier to areas previously considered marginal.

The adoption is intended of best agricultural practices combining applied technologies to each one of the production areas and crops, aimed at producing better yields, higher

quality and stability of the productions, preserving natural resources and the rural setting. The optimization of agricultural practices and the implementation of best practices adapted to climate variability aim at achieving sustainability of the resources in this scenario, particularly, that of the soil.

From the agricultural viewpoint, the implementation of practices of covering exposed soil, erosion reduction, silvopastoral or agroforestry proposals.

Furthermore, bearing in mind the significance of forage planning, pilot testing will be implemented in the different agro-ecological areas of the region proposed. This includes planning of forage supply, provision of reserves based on seasonal climate forecasts and climate tendencies observed to reduce the impact of adverse extreme effects.

Forage planning proposed as technical and methodological tool for the production management of carrying capacities and for the sustainability of the agro-ecosystems will allow considering the evolution and climate perspectives of each season as well as the response capacity of the different forage species and natural grassland pursuant to the expected changes and the variability observed in water availability.

Such climate-intelligent agricultural practices will be implemented in experimental and testing sites and will be communicated through extension services and regional projects.

Output 1.2 Implementation of a system for the management and transfer of risks for small- and mid-scale agricultural producers. Development of two pilot tests in the region selected.

The high climatic variability and the increase in the frequency of occurrence of extreme climatic events verified in the NEA region threaten the fulfilment of the objectives of reducing poverty and achieving sustainable development. The occurrence of droughts and floods, tornados or strong gusts of wind cause damage to production and capital assets giving rise to strong setbacks in the financial evolution of small and mid-scale rural producers, a highly variable level of revenue and the impossibility of repaying credits awarded.

The climate factor is key, being an external threat requiring integrated management of the risk through coverage instruments or application of prevention instruments, all of which require funding beyond the reach of family agricultural producers with few resources.

The impact of the different risk factors affecting agricultural activities becomes bigger when it comes to family producers, since they affect the only or the main livelihood of the family group, threatening its continuity in the activity and in the very rural setting.

Furthermore, it has social-economic consequences at local and regional levels, such as reduction of employment of hired workers (if any) and a reduction of the demand of goods and services as a result of reduced income of affected families.

Other negative externalities which may affect the local economy are related to the increase in late or non payment of credits in the region affected, whether these credits may have been granted by banks, financial institutions or by providers financing agricultural supplies. Furthermore, the increase of prices of the basic consumer basket may be brought about if the products affected are marketed in the domestic market at a national level.

In Argentina, as mentioned in Output 1.2 there is a highly-developed agricultural insurance market with over 20 insurance companies doing business, although 10 of such companies have the 80% share of the market. Despite this remarkable development, more than 90% of the volume of agricultural premium pertains to insurance covering hail for extensive crop growing in the Pampean region, particularly cereals and oilseed crops, with a minimum proportion covering hail risk for fruit trees and vine crops. Less than 3% pertains to multi-risk insurance for cereals and oilseed crops, and there is no insurance being offered for livestock production.

Furthermore, under these circumstances, the agricultural producer obtaining insurance receives no subsidy on the premium by the State, and it also pays VAT equal to 24% of the premium value.

In Argentina's northeast, family-based agriculture conducts mainly production activities such as horticulture (open-field and greenhouse), breeding of cattle and sheep, growing of cotton in vast production areas where, as mentioned in Component 2 (output 2.1) all the weather information available for risk analysis is scarce. With the activities designed under this sub-component, this situation is expected to improve, favoring an "enabling environment" for the implementation of component 1.2.

On the one hand, small-scale producers lack the financial capacity to afford the costs of insurance premium; on the other hand, the current conditions of the insurance market prevent insurers from having sufficient information for an appropriate coverage design suitable for the needs of those agriculture producers.

Through the intervention of this Project it is sought to reach out to insurance companies for them to implement two pluri-annual pilot plans, so that public-private partnership (PPP) and the grant of partial subsidy to pay for the premiums may make up for the market's failure and the conditions should arise for the design of a program for the transfer of risks aimed at small-scale producers.

However, should the available technical information prove insufficient or operating obstacles should hamper the design of an insurance program which engages insurance companies, it is proposed to evaluate an alternative risk management tool such as a contingency fund.

Even if in Argentina there is a well-consolidated agricultural-oriented insurance market covering against risks such as hail and frost aimed at agricultural production of the Pampean region, the development of insurance against multiple risks covering cutbacks

in the production as a result of other climate factors such as drought or water surplus is virtually nonexistent, as is insurance for farming production.

Small-scale producers in small-sized lands currently have no access to insurance coverage (insurance being here understood as traditional products based on individual policies) and therefore they need special mechanisms of risk transfer such as networks of social contention or catastrophe funds with a strong intervention by the State.

Making available for small producers strategies of agricultural risk management, such as the ones firms and producers with capital assets have access to, is part of a policy leading to redressing inequalities not only through the creation of awareness of social stakeholders but also through the improvement of the “rules of the game” in which small-scale producers are involved.

Strategies for risk management include increasing knowledge of the risks, generating opportunities for promoting the adoption of reduction and prevention measures, and implementing instruments of risk transfer such as agricultural insurance, revolving contingency fund or other hedging mechanisms. The design and successful implementation of an insurance plan or any other tool for risk transfer as adaptive measure shall consider and evaluate the main causes for production and social vulnerability of small-scale agricultural producers, type of crop, geographic area, availability of weather and production information, availability of channels of distribution, among others.

The design of the risk management instrument shall be conducted through a participatory scheme with the rural communities, incorporating their experience-based knowledge, their cultural heritage and the use of local resource, during the preparation of the final proposal.

Output 1.3 Implementation of improvements in the efficient use, catchment, harvesting and storage of water in the areas of intervention

The main problem producers of the area of intervention of the project face is the increase in the frequency and intensity of extreme events, ranging from floods to droughts where access to water is a strong constraint in maintaining the local livelihood. According to projections obtained from climate models, such tendencies will deepen in the future.

The mere magnitude of the problem related to water and the emphasis placed on preserving water as a multi-purpose resource account for its approach as a subcomponent in itself.

The negative effects of the water impoundment periods will be addressed as follows: by determining vulnerable areas to flooding and impoundment of water, the frequency and duration of each event in terms of the different geomorphologic areas covered by the project, and the different types of flooding, due to local intense rainfall, to flash foods, or

to flooding deriving from the overflowing of the Parana river or other streams.

The announcement of early warnings and seasonal forecasts, and their association to best agricultural management practices, allows planning for management of vulnerable areas. Management practices for areas not prone to flooding to create reserves and systems of agricultural rotation in critical periods will be implemented as well as the determination of maximum animal carrying capacity for each flooding period and other agricultural management practices suitable for soils prone to flood.

It is proposed to make available hybrid technologies adequate for catchment, harvesting and storage of water for small-scale producers through module systematisation. These will allow to carry out an efficient management of the resource, storing water in the periods when there is surplus for subsequent use in times of water deficit.

To such end, technology will be used which has been developed and proven to be efficient, subject to any changes necessary in terms of the specificities of each area of intervention, production systems, and social and cultural profile of the beneficiary group.

Component 2: Strengthening of information, monitoring and climate information management systems

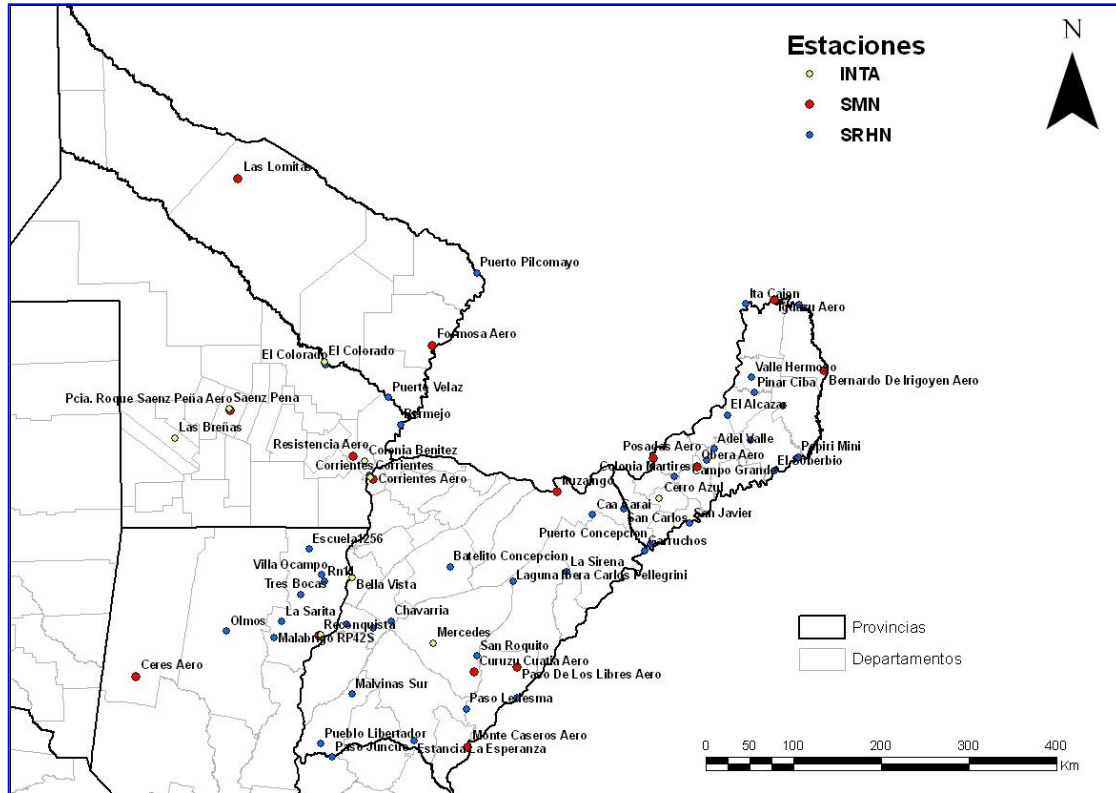
One of the main constraints at the time of making decisions for the implementation of measures of adaptation to climate change and reduction of risks of disasters is the degree of certainty regarding climatic events on the mid and long terms. This component is designed to support the strengthening processes of the regional and local information systems of the NEA region, including warning systems, contributing at the same time to improve the national monitoring systems fulfilling any commitments undertaken in the matter.

Output 2.1 Integration and expansion of agro-hydrometeorological networks in the NEA's provinces.

In NEA there are several sources of measurement of climate variables, aside from the networks of the National Institute for Agricultural Technology (INTA) and the National Meteorological Service (known as SMN in Spanish), such as rain gauges from different national and provincial institutions. However, the low density of weather stations in relation with the surface area of the territory, the absence of integration of all the sources, the quality and calibration of measurements thus obtained, and the lack of unification of the information into one consolidated database of public access undermine an efficient monitoring of climate change and variability.

The following map shows the location of weather stations belonging to the SMN, agro-meteorological stations belonging to the INTA, and pluviometric stations belonging to the Under-secretariat of Water Resources. Weather stations of the SMN meet WMO standards for surface synoptic stations. The INTA stations also gauge supplementary physical and biological elements, useful to determine the relation between weather and

the life of plants and animals. Pluviometric stations only report back daily accumulated precipitation values.



The minimum density of rain gauging stations recommended by the World Meteorological Organization (WMO) is of 5,750 km² per each pluviometer, in the case of inland plains (WMO, “Guide to hydrological practices, data acquisition, processing, analysis, forecasting and other applications” WMO - No. 168.1994). The following chart shows that the density above recommended is only attained in Corrientes and Misiones. Northern Santa Fe, density is close to that recommended, but it can be observed in the map that the distribution of pluviometers is concentrated in the northeast.

	Synoptic or agro-meteorological stations	Pluviometers	Total	Surface area (km ²)	Density (km ² per pluviometer)
Formosa	2	1	3	72,066	24,022
Chaco	6	4	10	99,633	9,963
Santa Fe (north)	3	7	10	60,000 (approx.)	6,000
Misiones	5	14	19	29,801	1,568
Corrientes	8	17	25	88,199	3,528
Santiago del Estero	1	0	1	136,351	136,351

In the province of Chaco, the Provincial Water Authority (APA) has in place a network of 65 traditional pluviometers taking two daily measurements, one at 7 a.m. – local Argentine time - and one at 5 p.m. - local Argentine time. The daily datum reported by this network does not coincide with the pluviometric day of the WMO, since it goes from 7 am to 7 am. Measurements are taken by police staff and are reported back via e-mail. The rain gauging series show a variable record, of average 20 years, with some locations having records for more than 30 years.

Bearing in mind the above mentioned constraints, the substitution of traditional pluviometers is suggested with electronic pluviometers approved by the SMN with communication via mobile phone, as well as the setting-up of more full weather stations which will allow the monitoring of other variables and the unification of the information in a consolidated database in systems open to the public.

The data collected by the new stations and the integration of the networks are expected to feed the processes of other sub-components such as the early Warning System, and the development of regional climate models and vulnerability maps of the following outputs.

Output 2.2 Development of an integrated Early Warning and Decision-making system to assess and manage climate risks, including extreme events

This sub-component seeks to enhance both local and regional capabilities of generating follow-up systems of water availability and climate variability which may underpin resource management in a sustainable manner supporting the processes of development and adoption of adaptive measures by the producers. The availability of tools for decision making will be of vital importance in a context of climate variability and change since it is necessary to adjust the systems and forms of production to any observed and projected variations. Besides, the assessment of vulnerability and risks, and the certainty of expected changes will enable to direct the design of public policies by incorporating climate variables in their development, and also assist producers with the planning of their production.

The Office of Agricultural Risk (ORA) of the Ministry of Agriculture, Farming and Fishing (MAGyP) currently generates for the Pampean region a series of agro-meteorological indicators aimed at decision-making by producers, insurance companies and the public sector, some of them can be accessed freely through its web page, while others are intended only for internal use by the Ministry and other official agencies.

The Follow-up of Soil Water Reserves developed by the ORA enables to assess the evolution of the content of water in soil, estimated through a daily water balance for different crops of the Province of Chaco (wheat, corn, sunflower, early-season soybean, late-season soybean, and cotton). The output allows the comparison between the content of water estimated for the season in progress with the normal values for such

soil type and crop. Furthermore, risk maps have been developed showing water surplus and deficits for such province.

This water balance model may be used by and adapted to be applied in other provinces of the region, and other production activities. However, in order to achieve such goal, the collection and evaluation of soil data, weather information, crop requirements and identification of vulnerability of the main production systems of the other provinces of the NEA are required.

Furthermore, and taking into account the singularities of the region, the development of water balances are required for subtropical forage resources, as is the analysis of abnormalities in forage production due to climate variability through satellite monitoring and development of other indicators which may enable to assess the risk of frost and extreme temperatures.

A key element for decision-making that will allow to manage climatic risks in the face of extreme events is the setting up of an Early Warning System (EWS)) for droughts and floods that will allow to process information generated, to analyse it and to generate appropriate outputs for the producers. Such system must focus on critical and highly vulnerable geographic areas of the project's area of intervention.

The EWS consists in the generation of a diversity of hydrometeorological hazard indicators through the use of information generated via the monitoring network expanded as set forth in component 2.1, and requiring the integration of technical teams, unification of criteria and indicators, and an appropriate system of analysis, warning, and decision-making.

Moreover, appropriate communication tools which will allow to disseminate the information generated and warning alerts to the rural population will be carefully analysed for the implementation of prevention measures.

To accomplish these activities and further support the overall implementation of the project, the outputs generated will be integrated into a geographic information system (GIS) to enable the combination of climate, physiognomy, geographic, infrastructure and vulnerability and risk information available for the different areas of intervention. This information system will help support the different analyses of impacts of climate, social vulnerability information, the geographic impact on the project's components, and any emergency situations that may arise as a result of climate variability and climate change.

Component 3: Generation of local and regional capabilities on the impact of climate change and variability and the implementation of adaptation measures

This component centres around the generation of local and regional capabilities and around communication to a broad array of direct and indirect stakeholders on the issue

of climate change and variability, particularly on the progress, results, lessons learned, and best practices deriving from the project's implementation.

The communication of hydrometeorological hazards and adaptation measures, both at different governmental levels and at the level of the project's direct beneficiaries, will promote the inclusion of key stakeholders both in the development of public policies and in decision-making.

This sub-component includes the development of workshops and seminars training programs for junior and senior-level local government officials and the generation of educational material for communicating and forming in the issue at hand and the adaptation measures implemented.

Output 3.1 Development of training and communication modules on risk management and transfer for governmental technical experts and small-scale agricultural producers

Technical formation and training through courses and seminars addressed to both public officials and direct beneficiaries for the generation of alternatives for adaptation and enhancing resilience is fundamental to make participatory processes more dynamic and to successfully adopt new technologies, practices and methods regarding natural and production resources' management.

The work with the farmers will aim to identify the perceived climatic risks and to assess those practices and measures that are being implemented to reduce the exposure of the community, and to help adopt new adaptation technology and risk transfer tools.

The work with local public officials, such as the agricultural extension workers and municipal officials will ensure the continuity of the practices of component 1, and the implementation of other adaptation measures with an appropriate approach to fit the particular situations and cultural environment of each community in the intervention areas.

Under this activity training modules and material on risk management, incorporation of risk transfer tools, and adaptation alternatives will be elaborated and distributed among the main educational institution, at the local, regional and national level.

Output 3.2 Training and formation addressed to municipal and provincial governmental units for hydrometeorological management and monitoring, analysis of climate information, use of methodological tools and development of modules of adaptation.

The technical capacity for government officials will allow to maintain and enhance the water availability and climate variability monitoring systems at the regional and local level, strengthening inter-sectorial working groups to secure the sustainability of the activities planned beyond the project implementation cycle.

A thorough adoption of new instrumental and monitoring networks, the use of new methodological tools demands not only training in technical aspects but also a necessary cultural change in the governmental units which must ensure the implementation, development and maintenance of component 2.

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and groups within communities, including gender considerations.

The area of intervention of the project centres on a group of marginal production lands, resulting from the expansion of the agricultural frontier. In turn, these lands group together small-scale family producers who have some of the highest values of vulnerability of the country, according to criteria of unsatisfied basic needs, access to utilities, levels of poverty and access to education, among others.

This project seeks to enhance production yield by identifying and implementing a series of adaptation measures which will allow to cope with a changing environmental scenario where it becomes more and more evident that water stress, both on account of surplus or on account of deficits, imposes a constraint on the capacity to improve living conditions of the producers in marginal lands, thereby preventing the achievement of sustainable development.

The adaptation measures selected will transfer to the beneficiaries the tools and technologies to improve their capabilities of response in the face of increasingly intense hydrometeorological phenomena, particularly droughts and floods occurring on more than one occasion within the same productive period hindering producers' livelihood.

The development and transfer of specific adaptation technologies, such as rainfall harvesting and the increase in the forage reserves when it is abundant for subsequent use in times of deficit, and the implementation of silvopastoral techniques seeking to improve farming yields, will result in an increase in agricultural yields and income thereby improving the living conditions of the producers, at the same time strengthening their capabilities to adapt to climate change and variability.

In addition, and considering the low capitalization of the beneficiary group, and the fact that their capital is entirely invested in the means of production and marketing, the project provides for development of tools for risk transfer, specifically the implementation of a pluri-annual plan of insurance or funds for climate-related contingencies considering all potential negative effects of climate change and variability over the social spectrum of greatest vulnerability, the family groups of small-scale producers.

On the social side, it is expected that the participatory processes provided for in the development of the project will enhance the local capacity of coming together and making collective decisions considering the tools that will be applied in the implementation of the project. The identification of common problems and the search for solutions with the greatest scope possible will also help enhance social cohesion.

From an environmental viewpoint, the increase in the institutional and productive capacity to manage natural resources and implement adaptation measures in the face of climate change will reduce stress on the natural resources thereby improving their quality. Several proposals included in the project seek to redress inherently marginal lands through the efficient use of resources and the implementation of best practices that will help diminish the load on the land, besides contributing to strengthen the carbon and essential nutrients cycles.

The production systems to be addressed by the project are: horticulture (Corrientes), growing of cotton and livestock production (Northern Santa Fe and Chaco). The project seeks to support 500 families (about 2500 people) through direct investments in adaptation measures and 2 insurance pilot projects (Pilot 1: horticulture producers of the 3 provinces; Pilot 2: cotton producers of Chaco). Over 6000 producers – men and women -will benefit from the Early Warning System.

The general purpose of the Project's proposal in terms of gender is to achieve gender equality across the organizations involved and to strengthen full participation and decision-making capability by rural women. This purpose is expected to be attained through the development of the following:

- Cross-cutting actions;
- Gender-related mechanisms and instruments across the Project's components;
- Gender-related actions and mechanisms in the Project's management and implementation.

As mentioned in the document, the number of men compared to that of women is higher in the rural population. Women account for less than 48% of the population.

As for the activities performed by women in the target region, such activities are related to self-consumption, the generation of small-scale income (on-farm activities, preparation and selling of products, off-farm work) and the care of the family production unit. It should be mentioned that, typically, the tasks above mentioned are not remunerated as productive work, the women being also amongst the ones denying the productive value of their own work.

This project from its very onset incorporates the gender approach. Through different projects and programs by the National Ministry of Agriculture, several activities are being developed which have gender indicators in place to measure the implementation thereof, and the degree of participation of women in them.

The analytical and operating implications of the gender perspective upon interventions will be considered. Some gender considerations as may be a part of the analysis are included herein below by way of example:

- The transfer of tools and technologies aimed at improving the response and adaptation capacity in the face of droughts and floods, among other hydrometeorological phenomena, is strictly subordinated to training for the correct use and maintenance thereof. Under such circumstances, the project provides that 20% of the time devoted to training will have a gender perspective so that producers, both men and women, may incorporate such perspective into their day-to-day. Furthermore, an affirmative action policy will be implemented by integrating a 30% quota for women (this quota is consistent with the applicable legislation in force in Argentina when it comes to candidate lists for the Legislature). In the case that such quota may not be filled, the time percentage devoted to training focusing on gender perspective will rise by 10% as from the initial 20%.
- Consultation and disclosure activities to be conducted during all stages of project preparation and implementation will take into account the adoption of this perspective's call and development procedures and methodologies related to the specific needs that may be identified in order to promote the participation of women therein.
- Amongst other factors, the design of the activities will consider the following:
 - a) Women's productive roles, in order to widen the economic opportunities, including improvement in productivity and competitiveness.
 - b) The diversity of family and household structures of the beneficiary population, paying special attention to de facto marriages, women as head of the household, and the presence of subsidized households composed of only a mother or only a father.
 - c) Motherhood and fatherhood, adapt the projects to the specific needs of parents in their access to the benefit thereof in those cases where there might be any obstacle to gain such access.

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

The inclusion of considerations of adaptation to the effects of climate change into Argentina's public policies is in most cases rare and fragmented. Although a national process has begun whereby a national strategy is being developed on climate change, reality dictates that the processes of reaching consensus among the different governmental agencies, and between these and civil society require an evolution that takes considerable time without even mentioning the assignment of resources, which are in many cases scarce.

The implementation of this project is then highly significant because it discusses a series of key forward-looking issues.

First, and as main line of analysis there is the fact that the beneficiaries of the project are amongst the most vulnerable population of the country, with a precarious livelihood and dependant on natural resources under significant stress as a result of non-sustainable production practices, the expansion of the agricultural frontier and the displacement of small-scale family producers onto marginal lands, and changes in the climate patterns resulting in changes to the frequency and intensity of rainfall.

The results expected from the project will try and supplement a series of measures already carried out by national, provincial and local governments to assist these highly vulnerable producers adding to that appropriate consideration of climate change and variability into strategic planning.

Secondly, it seeks to improve coverage and quality of the measurements taken by the hydrometeorological monitoring stations contributing this way to increase the spatial and temporal capacity to monitor and assess changes of climate patterns. This way, and together with the integration of new stations into the national monitoring network, contribution is made not only to the specific area of intervention by the project but also to the national (and international) capability of having in place series with more reliable data which will contribute to the development of solid climate models finally allowing a better understanding of climate change processes and informing decision making.

Lastly, the institutional capability of interaction and interpretation of the data resulting from the monitoring will be strengthened for the integration of the appropriate considerations into each sector's plans. Also, the implementation of participatory processes, both at the time of design and implementation, means that not only will the governmental institutions see their capabilities improved but also will those institutions of the civil society such as associations of producers and NGOs, which will take part in the projects' entire cycle.

The cost of untimely action may become an obstacle for any future intervention given that negative impacts of climate change can make unaffordable the adaptation measures required. Through this project, a critical mass of experience in the region will be created, and this will allow to identify lessons learned and best practices, supporting any construction process of a regional strategy in the face of climate change.

Pilot, experimental and proving sites will be defined for the activities of component 1, according to the different agro-ecosystems, and the different social/economic and production classes in the project's area of scope with a minimum estimated number of 12 sites throughout the entire duration of the project in producers' fields. Also permanent proving pilot sites will be established for training activities under the sphere of the 5 INTA's Experimental Stations located in this region.

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

The search to reduce poverty and for sustainable management of natural resources, and of the country and the provinces, is top priority for the Argentine government. To this effect, a series of plans, programmes and projects are being carried out aiming at integrating the social and environmental aspects into the implementation of all development activities. This approach is rapidly expanding all around the world, and Argentina is not the exception. During the year in which the goals of sustainable development will be ratified and improved at the next Rio+20 conference, the Argentine Republic is fully committed to reach the maximum standards.

This proposal is aligned with many initiatives, at national, provincial and local levels, whether undergoing drafting or in full development.

The Secretariat of Environment and Sustainable Development (SAyDS) is the governmental agency responsible for determining the minimum requirements of environmental protection to improve, restore, preserve, and develop and manage in a sustainable way native forests and any connected environmental services. Through law 26.331, on Preservation of Native Forests, adopted in 2007, the SAyDS has commenced a process of national extent of payment for ecosystem services contributing, among other things, to raise the resilience of the ecosystems in the face of climate change related impacts.

The Climate Change Office (DCC) was created within the structure of the SAyDS in year 2007 to deal with the new challenges deriving from climate change. In its role of coordination in environmental and sustainable development matters, the SAyDS decided to create in 2009 the Climate Change Governmental Committee. This committee acts as platform for coordinating all national state agencies involved in the design of public policies in this regard.

It is worth mentioning that the national government (represented by the different agencies in the Climate Change Governmental Committee) and the provincial governments (embodied in the Federal Environment Council) are carrying out the task of identifying goals and objectives for the preparation of a National Strategy on Climate Change (NSCC). Currently, the development of this strategy is undergoing its second phase, being the design of specific indicators, both for mitigation and adaptation actions.

The general objective number 1 of the NSCC is to identify, promote and implement adaptation measures to address climate change impacts, including variability, in particular in the most vulnerable communities, production activities and ecosystems.

Under the General Objective 1, the chapter on impacts, vulnerability and adaptation to climate change of the NSCC is divided into several action lines. Actions identified relevant to this project include mainstreaming climate risk management into land planning processes, enhancing resilience of agriculture and forestry systems and the strengthening of systematic observation and monitoring systems, among others.

It is expected that the implementation of the present proposal will contribute to further the specific objectives of the Strategy, contributing to the overall aim of sustainable development and poverty eradication.

Moreover, the Third National Communication on Climate Change is being prepared to be submitted before the United Nations Framework Convention on Climate Change as one of the many commitments undertaken at an international level. Such communication reinforces the evaluation processes regarding impacts, vulnerability and adaptation to climate change that started with the two first National Communications, already submitted, and whereby the area of intervention of this proposal is identified as being of high climate and social vulnerability.

As far as the agricultural sector is concerned, the Agri-Food and Agro-industrial Participatory and Federal Strategic Plan 2010-2020 (PEA) is promoted by the National Government as one of the main central lineaments of its administration in the National Ministry of Agriculture, Farming and Fishing (MAGYP). It was launched May 14th 2010 and its purpose has been to generate a shared vision of the future for the Sector, with contributions from all stakeholders comprising such sector. This is about a collective effort articulated by the National State in terms of a national project orienting work, resources and priority actions for the next decade. The PEA has promoted the participation of stakeholders of the Sector through spaces designed to enable interaction and dialogue.

Such spaces included the Federal Councils: the Federal Agricultural Council (CFA) integrated by the 23 Argentine provinces; the Federal Advisory Council on Science and Technology (CFACyT), including 53 university schools of agronomy, veterinary sciences, agribusiness, food sciences, and economics, belonging to both public and private universities; the INTA [National Institute for Agricultural Technology]; the SENASA (Agri-food Health and Quality National Service), other decentralized agencies subordinated to MAGyP, and international agencies ECLAC, FAO, IICA, UNDP; the Federal Council of the Productive System (CFSP) made up of more than 140 commercial chambers from the different production complexes of the Sector, the Federal Council for Economic and Social Development (CFDSEyS), comprising those entities of the civil society representing different social, environmental, territorial and institutional interests.

In this first stage, Goals have been identified for the Agri-food and Agro-industrial Sector to be achieved by year 2020. These goals were prepared in collaboration with the INTA, based on the estimation of potential sustainable production caps, according to which it

is possible to determine the maximum production potential of each region and of the main agri-food chains, bearing in mind environmental matters, land management and social inclusion issues. Sustainable production caps were prepared taking into account concepts of balance and equilibrium, and the idea of harmonizing growth with development according to four strategic ends: economic/productive, social/cultural, territorial/environmental and institutional.

In turn, the Rural Change Unit (UCAR) of the MAGyP brings together a series of programmes being developed at a national scale targeting at poverty reduction, processes of social inclusion and environmental protection. Such programmes include the PRODEAR, seeking to reduce rural poverty through the effective integration of rural poor families to the social and economic life of the country, developing capabilities in the organized rural population, for their integration into a dynamics of sustainable development that will allow them to improve their living conditions. Also the Provincial Agricultural Service Programme (PROSAP), implementing, at both provincial and national levels, projects of public investment, socially and environmentally sustainable, increasing coverage and quality of rural infrastructure and agri-food services.

From a perspective of production, development and reduction of poverty, the MAGyP is currently implementing the Development Project of Small Agricultural Producers (PROINDER), a programme of national coverage, decentralized in nature, which seeks mainly to improve the living conditions of 40,000 small-scale agricultural poor producers through a steady improvement in their income and an increase in their degree of organization and participation, and strengthening of national, provincial and local institutional capability to generate rural development policies.

Given the technical complexity of the different aspects inherent to the assessment and mitigation of the risks affecting agricultural production, in 1999, the Agricultural Risk Office was created within the then Secretariat of Agriculture, Farming, Fishing and Food, with the purpose of coordinating and enhancing the action of the several decentralized agencies and bodies as regards all that was related to production, commercial and financial risks of the sector.

The development of a technical area specialized in assessing the impact of weather phenomena on agricultural production holds a direct benefit for the producers, who have free access to such information, and an indirect benefit as well, by providing validated sources of information to the insurer sector, contributing this way to reducing insurance premiums.

In these terms, the main actions developed by the MAGyP through its Agricultural Risk Office are:

- The performance of technical studies and compilation of statistical data on the incidence of adverse phenomena for the preparation of agro-climate risks maps;
- Providing technical and financial assistance to producers and provincial governments, promoting risk management and insurance programmes;

- Funding insurance programmes in regional economies with the purpose of improving access of small-scale agricultural producers to risk coverage;

The National Institute for Agricultural Technology (INTA) is an agency created in 1956 with the purpose of “promoting and strengthening the development of research and agricultural extension and, with the benefits resulting from these fundamental actions, furthering mechanization and improvement of agrarian businesses and rural life”. It is subordinated to the Ministry of Agriculture, Farming and Fishing, having operating and financial independence.

INTA’s main purpose is to contribute to the competitiveness of the agricultural, forestry and agro-industry sector across the national territory within an ecological and social sustainability framework. Its actions prioritise the generation of information and technologies for processes and products from this broad sector, and makes such information and technology available to the rural producer through INTA’s outreach system and projects of regional extent.

- E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc.

The project will be implemented by national agencies and their provincial counterparts responsible for seeing to the compliance with national and provincial laws and standards in matters of production, environmental protection, regulatory frameworks on climate change, focusing on processes of poverty reduction and social inclusion, pillars of the National Government plan.

To this we must add that a substantial portion of activities to develop will be carried out by the National Institute for Agricultural Technology (INTA) and its relevant rural extension services. This institution aims at developing programmes of technological and scientific innovations to support sustainable development processes taking into account national and international standards. The Climate and Water Institute within the INTA, part of the Implementation Unit of the Project, serves as a national benchmark in terms of climate change for the agricultural sector, generating tools and knowledge on impacts, vulnerability and options to adapt to climate variability and change.

Lastly, the National Implementing Entity, the Rural Change Unit, having a vast experience in management of resources deriving from different institutions of international and regional funding, will make sure the project meets the highest fiduciary standards.

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

There is no duplication with other sources of funding. Although there are being implemented several initiatives in the project's area of intervention, none of them has as central lineament the activities of adaptation to climate variability and change, with a focus on the development of tools for decision making considering all environmental and climate aspects as central issues, and the strengthening of inter-institutional dynamics as provided therein.

Even more, without the funding from the Adaptation Fund, the above mentioned actions would not be carried out thus delaying – with dangerous consequences – much needed measures that will allow small-scale family producers to improve their living conditions and protect their livelihood, which is threatened by the adverse effects of climate change.

This project allows taking to practice several management options identified in relevant processes, such as the Climate Change National Strategy, and it also supplements other initiatives described in D above.

Activities taken and potential synergies

Initiatives	Lessons learned	Synergies with the Project
2nd Regional Water Forum organized by the Regional Economic Council of Northern Santa Fe (CORENOSA) Participants: INTA, National Technical University, Secretary of Water Resources, Ministry of Agriculture, Farming and Fishing – 300 attendants March 30th 2012.	Conclusions on Water for Agricultural Production: needs of training in and implementation of farm-wide agricultural use of water. Working in adaptation of crops and production activities to the environmental conditions of the region. Funding needed to extract and distribute water, water harvest and agricultural use, setting apart projects for production increase (loans) from projects to cover unsatisfied basic needs (subsidy)	The execution of an agreement between governors of Santa Fe, Chaco and Santiago del Estero, with the purpose of creating an inter-provincial basin committee for the area of the Bajos Submeridionales (lowlands) enables governance of a Regional Project to manage hydro-meteorological risks.
Agricultural and Agro-Industrial Strategic Plan Roundtable for Risk management and agricultural insurance . Ten of the main insurance companies of the Argentine market attended this roundtable, as did representatives of the SSN, representatives of the INTA and producers' associations, a reinsurance company.	Goals posed by the roundtable were defined: "To evaluate, design and implement different modalities of risk transfer mechanisms that will accommodate different production systems, different agro-ecological areas, and areas of high social and economic vulnerability"	The need for instruments for the transfer of risks for family agriculture was brought to the attention of the attendants to such meetings. Several requirements were established at such meetings to set some assurance conditions (geographic diversification of the units to be insured, subsidy upon premiums, joint policies to reduce costs, etc.)

Meetings were held during 2010 and 2011.		
<p>PRODERNEA – ORA</p> <p>Experience of agricultural micro-insurance for small-scale horticulture producers of the province of Corrientes. The PRODERNEA granted support to small-scale producers producing vegetables/legumes in greenhouses, through the granting of subsidy and microloans for investment in production infrastructure. This contributed the funds to subsidize the premiums. The ORA and the insurance companies designed the coverage.</p>	<p>Insurance coverage was obtained from a pool of companies La Segunda – Sancor in one joint policy covering all agriculture producers. It covered the insured against damage caused by hail, wind and/or fire on the greenhouses' structures and plastic. Also it covered damage caused by the same factors on the fruits of some plants (tomato, pepper and green beans).</p>	<p>The program was developed over the course of one year. Accidents/incidents occurrence was of 500%, that is to say that the premium collected turned out to be 5 times lesser than the claims paid. However, this was a year with extraordinary accident occurrence, and it required continuance of the plan, via premium adjustment. This is a program that may be extended to diversify risks (by incorporating other areas), that requires synergies between technical experts, producers and companies to evaluate with accuracy any adverse events and reduce operating costs.</p>

The project will build on and draw from experience acquired nation-wide by the institutions committed to the development of the adaptation project submitted for consideration.

Institution	Program - Project	Experience gained
Agricultural Risk Office (ORA)	The policyholder and the insured was the PRODERNEA for the benefit of 20 small-scale producers with an average greenhouse size of 2000 m ² (20 ha under roof).	Insurance pilot project for vegetables/legumes growing in greenhouses in Corrientes. There are 900 has of greenhouses in the province, which reflects the potential for coverage development.
National Institute of Agricultural Technology (INTA)	INTA Strategic Area – Natural Resources (water, Climate, Soils and Biodiversity)	Research into problems related to water scarcity and issues regarding water, catchment, storage and distribution infrastructure and technology for human consumption, animal watering and crop irrigation.
Agricultural Risk Office (ORA)	PROSAP Provincial Program of Agricultural Services	Development of agro-climatic risk maps, based on the systematic treatment of climate variables and their

		<p>impact on agricultural production. Water stress and surplus charts for crops developed so far are for the Humid Pampa and for Chaco.</p>
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G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

The project includes a specific component on knowledge management and creation of capabilities (component 3), which seeks, through a series of specific activities, to strengthen the response capacity of national, provincial and local government officials, and of producers in regard to climate variability and change, and its impacts. Specific training activities will be conducted simultaneously with the design and distribution of materials regarding the implementation of the project and with lessons learned and best practices, which will be handed out amongst stage agencies, producers' associations and educational centres.

Also, during implementation, several monitoring, evaluation and reporting activities are provided gathering key information on the progress thereof, which will allow developing material for release and distribution amongst the different stakeholders.

Training workshops and seminars will also be conducted for local, provincial and national officials with the purpose of strengthening institutional processes aiming at assessing climate risks, including identifying synergic underlying drivers, and designing and implementing appropriate measures of risk reduction and management in the context of climate change.

As part of the project activities under the knowledge management component, it is expected that all emerging lessons learned and challenges during implementation will be captured in different component products, and contribute to a better understanding and dissemination of good practices of risk management and adaptation. At the same time, and in light of the objectives of the National Strategy on Climate Change, the project will ultimately contribute to further mainstream risk reduction, management and adaptation into sectoral planning and implementation, thus supporting replication of activities in other areas of the country.

Furthermore, throughout a series of pilot experiences, this component is expected to capture the whole cycle of design and implementation of a series of activities, including risk transfer tools and concrete adaptation and risk reduction measures which have proven successful, with the objective of replicate them in regions with similar socio-economic characteristics, supporting small-scale producers and the most vulnerable communities by strengthening their resilience.

All information generated and managed under component 3 will be used to raise awareness of different sectors of society and government, using existing structures (i.e. Governmental Committee on Climate Change) as dissemination platform, considerably expanding the benefits of the project.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations.

Target population (eligibility requirements)

Comprising small-scale producers, both men and women, with a certain endowment of production resources and entrepreneurial management capacity, facing multiple constraints but having objective conditions that allows them to become a part of a process of technology incorporation and diversification, and thus with the potential to compete in the markets, subject to the following eligibility requirements: living in the rural area where the project is implemented, and direct “on-farm” work by the beneficiary with prevailing family labor force; working with a production unit of a total maximum 25-ha surface area or less; the bulk of the family income must derive from the production unit; keeping a production structure clearly oriented to commercial purposes, which may co-exist with self-consumption production, provided however that the latter should contribute to a lesser extent to the family income.

The project proposal arises as a result of a series of consultations conducted at different levels and with relevant stakeholders which allowed identifying the area of intervention and its beneficiaries.

First, in April 2011 a meeting was held in the NEA region. The Climate Change Office presiding over the Governmental Committee on Climate Change led the first regional meeting to identify potential development lineaments of regional strategies in climate change. Environmental, tourism, production, public health, and finance related agencies of the provinces of the region attended such meeting. Also, stakeholders of the civil society such as the students’ unions from provincial universities and non-governmental organizations, including producers’ associations, also attended such meeting.

Progress was made in the identification of action lineaments in matters of adaptation to climate change, stressing the need to take action in relation with the intensification of hydrometeorological events. The special regional situation was considered, particularly the high social vulnerability of small-scale producers as well as the need to focus any future actions on such group of beneficiaries.

National Strategy on Climate Change First Regional Meeting NEA - Participants

Full Name	Organization
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Carlos Roig	INTA [National Institute for Agricultural Technology] Region Chaco-Formosa
Andrea Acosta	INTI [National Institute of Industrial Technology] Posadas Unit. Regional NEA
Mario Rujana	Corrientes' Institute of Water and the Environment - (ICAA)
Omar Dufort	Corrientes' Institute of Water and the Environment – (ICAA)
Miguel Brunswing	Ministry of Production and Environment of Chaco – Undersecretary of Natural Resources
Pedro Jover	Ministry of Production and Environment of Chaco – Undersecretary of Natural Resources
María Noelia Ordenavia	Ministry of Production and Environment of Chaco – Undersecretary of Natural Resources
Sebastián Arriortúa	Ministry of Production and Environment of Chaco
Nancy Tognola	AMSA Environment Manager
Dardo Marti	CONICET [National Council for Research on Science and Technology]- UNAM [National University of Misiones]. Biodiversity
Nazareno Castillo	Secretariat of Environment and Sustainable Development. Climate Change Office.
Elena Palacios	Secretariat of Environment and Sustainable Development. Climate Change Head Officer.
Hugo Bay	President COFEMA [Federal Environmental Council]. Secretary of Natural Resources and Environmental Quality - Formosa
Pablo Ramos	Spokesman -IPAF [Institute for Family Small-scale Agriculture] NEA Region

Also, in November 2011 a workshop titled “Ayudando al Liderazgo Femenino para Fomentar la Producción Femenina” - Helping Women’s Leadership to Promote Women’s Production - was held in the city of Chaco for the Development Programme of Rural Areas, PRODEAR, through the Ministry of Production and Environment of Chaco, with the purpose of getting to know the beneficiaries of the projects and to work with the local technical experts on the more pressing needs to improve production and selling levels. Producers from Villa Angela, Villa Berthet, San Bernardo and Charata attended

this workshop. Also members of cooperatives and entities devoted to honey production, goat breeding and horticulture attended as well. Workshops began with a presentation by each one of the attendants, the project in progress to which they belonged, and which their immediate need was. Discussion centred round the importance of organizations, their roles and functions within the above, and the importance of value chains, with a focus placed also on women leadership.

Workshop attendants

Full Name	Organization	Town
José Orrechia	Goat production	Villa Ángela
Patricia Pereyra	Goat production	Villa Ángela
Pablo Pasieczniz	Beekeeping	San Bernardino
Eliana Miani	Feria Franca	Villa Ángela
Jorge Praiselstein	Beekeeping	Charata
Mario Héctor	COPAL	Charata
Luis Garber	PRODEAR	Villa Ángela
Silvia Janos	Goat production	Villa Ángela
Shelia Zdanowski	Peproca	Villa Ángela
María Villarreal	Preproca	Villa Ángela
Mirta Bortnic	VAMOS Horticulture Coop.	Villa Ángela
Juan M. Bortnic	VAMOS Horticulture Coop.	Villa Ángela
Carlos Cañete	Preproca	Villa Ángela
Adrán Benítez	Preproca	Villa Ángela
Pedro Sánchez	Doble Celda	Villa Correa
Eduardo Juárez	Presidente Cons.	Cnia el Nandubay
Juan estéban Kiffel	Doble Celda	Sta. Sylvina
Leonardo Daniel Bravo	Doble Celda	Sta. Sylvina
Yolanda Della Gavia	Doble Celda	Sta. Sylvina
Facundo Bravo	Doble Celda	Sta. Sylvina
Nelson Deheza	Doble Celda	Sta. Sylvina
Juan Kazmer	Feria Franca	San Bernardo

This year, in addition to the meetings mentioned in the project, family agricultural producers from Chaco's settlements of Lote Morassi, El Recoveco and El Palmar prioritised the issue of access to water in a series of workshops by INTA's technical experts through the Institute of Technological Research and Development for Small-scale Family Agriculture of NEA Region (IPAF's NEA Region), Agricultural Experimental Station (EEA) Las Breñas, and Family Agriculture Under-secretariat, Chaco delegation.

Over 120 producers attended the workshops, 55 % of which described difficulties in access to water not only for production purposes but also for family's consumption.

After a series of presentations on the water cycle, climate changes and alterations of natural sources, different alternatives that may allow access to water were agreed upon in a participatory manner with the producers. Based on that, actions were prioritised oriented to catch rainwater in water wells and dams.

With regard to the insurance component of the proposal, is important to highlight the efforts taken by The Agricultural Risk Office to engage with the private sector in order to enhance the potential coverage of the insurance scheme, particularly for the most vulnerable. The ORA, with the technical support of the World Bank, is working in the development of forage insurance based on the NDVI index (obtained via remote sensing) for the southwest region of the province of Buenos Aires, with the purpose of providing protection to cattle livestock producers in the face of severe droughts and other climate events affecting forage production.

In developing this insurance, a group of five Argentinean leading insurance companies (La Segunda, Mapfre Seguros, Provincia Seguros, Sancor Seguros and San Cristóbal) have taken part in this project from the very onset, funding part of the computing system necessary for the Agronomy School to process satellite imaging. They also have so far shown themselves interested in taking part in an insurance pool to underwrite a potential NDVI index insurance. Furthermore, for the development of this insurance, the MAGyP [Ministry of Agriculture, Farming and Fishing] has held numerous consultation meetings with producers' associations from the region, with the National Office of the Superintendent of Insurance, and with provincial authorities.

A critical part of developing a final proposal will be to conduct a series of activities devoted specifically to carry out consultation with key stakeholders of the area of implementation (small-scale family producers grouped in producers' associations per activity and per geographic area; local authorities belonging to the municipalities in each one of the districts; leaders of the indigenous communities; associations of peasant women, etc.). Particularly, there is planned a full one week field trip with the project team to the selected areas to conduct focused workshops, technical meetings and interviews, including activities targeting women, to identify, assess and design the appropriate set of interventions. This process will enable not only to identify those actions which will better fit the needs of each one of the groups identified, but will also help create the channels and modalities for their active participation in the project's development.

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

Argentina, with its great variety of climates and ecosystems, and an economy strongly based on primary production and manufacture of derived products, is highly sensitive to changes in rainfall and temperature patterns. Specifically, the area of intervention is one of the geographic areas where the historic series recorded and the results of projection studies show a clear increase in the intensity of contradictory extreme events such as droughts and floods, occurring many times within the same year. As a result,

commencement of a process of internalising production practices specifically designed to incorporate the considerations of such anomalies becomes necessary, as it becomes necessary also to generate the institutional capability that will allow the implementation of public policies to address the underlying drivers of risks in the context of climate change and variability.

As previously mentioned, even though there are in place policies targeted at highly vulnerable producers, these policies have not been developed taking into account the effects of climate change and variability upon the production processes of this social stratum in particular. It is important to point out that, whereas medium-sized and large-sized producers have the appropriate technologies and tools to generate adaptation processes, access to information and adequate means constitute an important constraint when thinking of a temporal horizon that exceeds the survival of the family group in terms of avoiding migration to cities with negative consequences for the individuals who usually get trapped in indigence loops.

This proposal seeks to provide small-scale producers located in marginal lands with the tools, technology and information adequate for the processes that occur at both local and regional levels as a result of climate change. This way, appropriate production techniques may be implemented that will allow improving yields and in turn improving life quality focusing on food safety. Likewise, the information systems developed coupled with the tools of risk transfer will be of great help for the protection of assets, scarce in most cases, on which the livelihood of the families targeted by the project lies.

Among the activities proposed, the main core of intervention lies in component 1. Under this there are a series of measures planned specially to address the context-specific situation, in the light of the whole spectrum of risk reduction, risk management and risk transfer in the context of climate change.

One important gap that the project aims to close is the lack of solid data series that can feed the decision-making processes at different levels. With the strengthening and integration of the hydro-meteorological monitoring stations, and the capacity building provided, the project will contribute to the regional information system, including an Early Warning System, enhancing local authorities and producers to better assess risks.

The information generated under these activities is expected to supply additional inputs for the adoption of a series of different approaches to address the impacts of climate change and variability. Under component 1 the project will be piloting measures to better response to the needs of the most vulnerable groups in the area of intervention. In particular, through the incorporation of climatic considerations into production processes, adaptation to new conditions will enhance the resilience of the beneficiaries of the region.

At the same time, strengthening community integration through participatory approaches, capacity building of local and national authorities and strengthening of

information management systems, are expected to address non-climatic underlying drivers of risk, such as transparency, good governance and poverty reduction.

Furthermore, with the inception of a regional risk transfer scheme, which will allow poor people to access these types of tools, the project is expected to enable the appropriate environment to attract the private sector to support, and replicate, this experience, giving farmers new opportunities of development.

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

The different components and its associated outcomes were designed based on the experience and knowledge of the technical organizations involved, particularly those of the National Institute for Agricultural Technology, which is an entity leader in the country in terms of technological innovation and rural extension. Also, the engagement of the Agricultural Risk Office of the Ministry of Agriculture, Farming and Fishing, and the participation of the Climate Change Office of the Secretariat of Environment and Sustainable Development in the preparation ensure that not only national maximum standards are met in terms of environmental protection and sustainable development but also the development of the project is aligned with the strategic guidelines prepared by the national government together with the provinces.

This guarantees that, strategically speaking, the implementation and follow-up of the activities provided for in the project, regardless of its horizon of implementation, is ensured thanks to the participation of organic agencies answering to long term plans such as the Strategic Food Plan and the Climate Change National Strategy.

The rural extension units, the provincial implementation units and the local agencies of implementation will ensure the sustainability of the results attained in this project through an ongoing training of key stakeholders and follow-up by all parties involved.

As regards the expansion of the agricultural frontier, Argentina has adopted a series of measures with the express purpose of preventing the agricultural frontier from displacing family-based agricultural producers forcing them to migrate to cities or other urban centres.

Argentina has in place several regulations and instruments prioritizing the constraint of the expansion of the agricultural frontier, bearing in mind that such expansion could result in the disappearance of ecosystems such as forests and wetlands, which provide environmental goods and services.

Amongst the several existing initiatives and instruments, the following can be mentioned:

- The creation and strengthening of the Unit for Rural Change (UCAR) under the scope of the National Ministry of Agriculture, the programs and projects of which cover broad public investment profiles for the strengthening and improvement of living

conditions of small-scale rural producers, ranging from infrastructure and the services required for production, to the improvement of living conditions of the rural residents – both men and women –, to the strengthening of public rural institutions, to the increase in agricultural sectors' competitiveness.

- The enactment of Law 26.331 on Minimum Assumptions for Environmental Protection of Native Forests providing the putting on hold of any new permit to clear wild vegetation until each province should conduct a Land Management Plan of their Native Forests in a participatory manner. Amongst the criteria for land management there are the rights of the indigenous and peasant communities using forests, woods and wild vegetation in maintaining their culture, and for survival. Such law enables the regulation of the agricultural frontier expansion and any other change in land use by classifying the uses allowed for the lands by establishing protection and management levels according to their conservation category. It forces an Environmental Impact Assessment and a public hearing before authorizing any conversion of the land use. As of February 2011, 17 out of the 24 provinces: Chaco, Chubut, Cordoba, Corrientes, Formosa, Mendoza, Santiago del Estero, Rio Negro, Salta, San Luis, Tucuman, Jujuy, La Pampa, Neuquen, Santa Cruz, Santa Fe and Tierra del Fuego have prepared their land management plan through participatory processes with several sectors from the civil society.
- The projects and programs comprising the UCARⁱ incorporate the negative-list principle in their Environmental and Social Manuals, safeguards to avoid pushing forward projects that may lead to the expansion of the agricultural frontier, in order to ensure the continuance of small-scale rural agricultural producers in their territories.
- The approval of the Universal Allocation per Child via Presidential executive order establishing the payment of a monthly allocation per each child under the age of 18 in the care of an adult, one of the main purposes being that of enabling the decision to remain in rural settings for those small-scale producers living therein and not having appropriate resources that may allow their subsistence.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The UCAR (Rural Change Unit) has recently been rated as National Entity of Implementation before the Adaptation Fund of the Kyoto Protocol. Such unit shall fulfil the functions inherent to a NIE in line with the fiduciary and operating standards required at the time of their accreditation.

A project's general Coordinator shall be appointed, together with a technical assistant, who will be responsible for the project's day-to-day operations. Their function will be to supervise the execution of the different modules, the drafting of the assessment reports, and to coordinate, supervise, and support the activities of the Implementation Technical Unit. Also, there will be a Field Coordinator who shall supervise the activities in the field reporting back to the General Coordinator and supporting its functions.

In turn, the project's technical implementation shall be in the care of the Ministry of Agriculture, Farming and Fishing (MAGyP), the National Institute for Agricultural Technology (INTA) and the Secretariat of Environment and Sustainable Development. Such agencies and their relevant areas shall comprise the project's Technical Implementation Unit, which will have in place any relevant agreements for joint implementation.

In addition, project implementation will rely on the provincial units of rural extension of the INTA and the provincial units of existing programmes within MAGyP.

Lastly, during the consultation processes for the preparation of the final proposal, local agencies will be identified as will producers' associations and community leaders for their engagement in the decision making and implementation processes.

This implementation programme is in line with the development of process-based agriculture with a systemic approach with a tendency to keep the same or increase the ecosystem services, which seeks an ongoing improvement and adaptive and sustainable management of production systems, and allows the managing of environmental heterogeneity as provided for in the Intelligent Agriculture Program (2011) of the MAGyP.

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

Project's risks can be characterized as technical, institutional or governance-related.

Technical risks include failure to obtain sufficient information to characterize the size of the changes brought about by the overheating of the troposphere. Project's preparation activities will include an analysis of information availability and information needs or gaps that the project might help to overcome. On its own the project provides for the use of modern techniques for remote monitoring supplemented via a network of field stations and modelling tools to be used to reduce the risk.

Institutional risks refer to the chances that not all necessary stakeholders may take part in the process with the capacity and commitment required. The management component and the participatory meetings will be used to mitigate this risk.

Given that this project seeks to address the adaptation required over a long time period, there is a risk that the decisions and actions taken during the project may not be ratified

by future administrations. During the design of the project, measures and commitments to mitigate this risk shall be discussed.

A detailed analysis of financial risks and project's management risks will be included in the final version thereof.

- C. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan. Include break-down of how Implementing Entity's fees will be utilized in the supervision of the monitoring and evaluation function.

Monitoring will be divided into two sections. On the one hand, a technical monitoring and evaluation of the project will be conducted, to be applied by the Technical Implementation Unit with the support of the General and Field Coordinators. Such will focus on the technical aspects of the implementation of the different activities provided therein, and reports will be prepared for their communication and disclosure, feeding activities of component 3.

On the other hand, a financial and project's management monitoring and evaluation will be carried out, which will fall back on the National Implementation Entity, in this case the UCAR. Through the implementation of an entire cycle of the project, the UCAR will carry out regular M&E activities, providing reports on the progress thereof.

- D. Include a results framework for the project proposal, including milestones, targets and indicators and sex-disaggregate targets and indicators, as appropriate. The project or programme results framework should align with the goal and impact of the Adaptation Fund and should include at least one of the core outcome indicators from the AF's results framework that are applicable⁶.

The results framework for the project's proposal, including any key stages, goals and indicators, including sex-disaggregate goals and indicators, will be developed in the presentation of the final proposal.

- E. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

A detailed budget shall be included in the final proposal when identifying in detail the actions and costs of their implementation.

⁶ Please refer to the *Project level results framework and baseline guidance* for the Adaptation Fund's results framework and guidance on developing a results framework and establishing a baseline [add link here].

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

The disbursement schedule will adjust in the final presentation to the schedule developed in the budget and will respond to the stages of implementation of the different sub-components and outputs associated thereto.

ⁱ Provincial Agricultural Services (PROSAP) funded by the World Bank and the Inter-American Bank of Development, Rural Development Project of Patagonia (PRODERPA) funded by the IFAD, Development Program of Rural Areas (PRODEAR) – IFAD, the Rural Development Project for Northwestern Argentina (PRODERNOA) – IFAD, and the Development Project of Small-scale Agricultural Producers (PROINDER) funded by the World Bank.