REQUEST FOR PROJECT/PROGRAMME FUNDING FROM ADAPTATION FUND

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

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

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

Complete documentation should be sent to

The Adaptation Fund Board Secretariat
Email: secretariat@adaptation-fund.org

ADAPTATION FUND

DATE OF RECEIPT:
ADAPTATION FUND
PROJECT/PROGRAMME ID:
(For Adaptation Fund Board Secretariat Use Only)

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 FOR 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:	**5.600.000** (IN U.S DOLLARS EQUIVALENT)

PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

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, East of the province of Corrientes and Santiago del Estero 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 Tafí-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 the province of Misiones 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 at one end, whereas at the other end of the region, rainfall reaches 700 mm, featuring, however, a common pattern of climate variability.

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 21ºC. Mean precipitation ranges from 800 to 1100 mm annually, declining toward the west, where the climate is 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.

The eco-region containing Santiago del Estero normally features seasonal rains during the summer, where high temperature values can be recorded. Winter is dry and relatively mild, although frost is recorded every year. The essential feature is the high variability from one year to the other, from one season to the next, and even within the same season. This is clearly shown in the pattern of the elements with greatest influence on plant growth, that is temperature and precipitation.

The province features a gradient of precipitation starting from average 750-800 mm in the East, decreasing towards the center and Southwest, with a 550-mm isohyetal line across the center of the territory. Values go up towards the mountain area and the Northwest, border with the province of Tucuman, and go as low as 400 mm in the Southwest.

The water balance has negative values in it, even in humid periods as are springs and summers. Potential evapotranspiration (PET) ranges from 900 to 1,100 mm a year.

Temperature diminishes following a N-S direction, with a high annual amplitude. The province is surrounded by the 47ºC isotherm (absolute maximum), which defines the so-called "heat pole of South America".

Days with no frost, depending on the specific area of the province, range between 260 and 310 days.

As for winds, it is worth mentioning the influence of warm and dry winds from the NE sector during the summer, due to its negative effect upon crops on account of its high desiccant power. Winds from the southern sector cause sharp temperature declines in spring, bringing about losses of crops due to late frost events.

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 two provinces in severe condition (Misiones y Santiago del Estero).

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, the northern area of the province of Santa Fe and the eastern area of the province of Santiago del Estero.** The departments included in the area of intervention are shown below.

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 full 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 with 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.

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.

Province of Santiago del Estero

In general terms, the agro-economic region known as “Chaco Húmedo” [Humid Chaco] typically features a mixed production system, combining crop and livestock production. However, in the Departments of Copo and Alberdi, within this region and located in the northeast of the province of Santiago del Estero, exploitation - at times inadequate – of the native forest prevails comprising species such as *quebracho colorado* [*schinopsis balansae*], *quebracho blanco* [*aspidosperma*], carob tree, *mistol* [*ziziphus*] and *chañar* [*geoffroea decorticans*]. The purpose of such activity is the production of hard wood for construction (pallets, openings and floors), carpentry (manufacture of furniture), manufacture of rural goods (such as stakes and products from sawmills), and the production of railroad ties, saw-milled timber, tannin, firewood and coal.

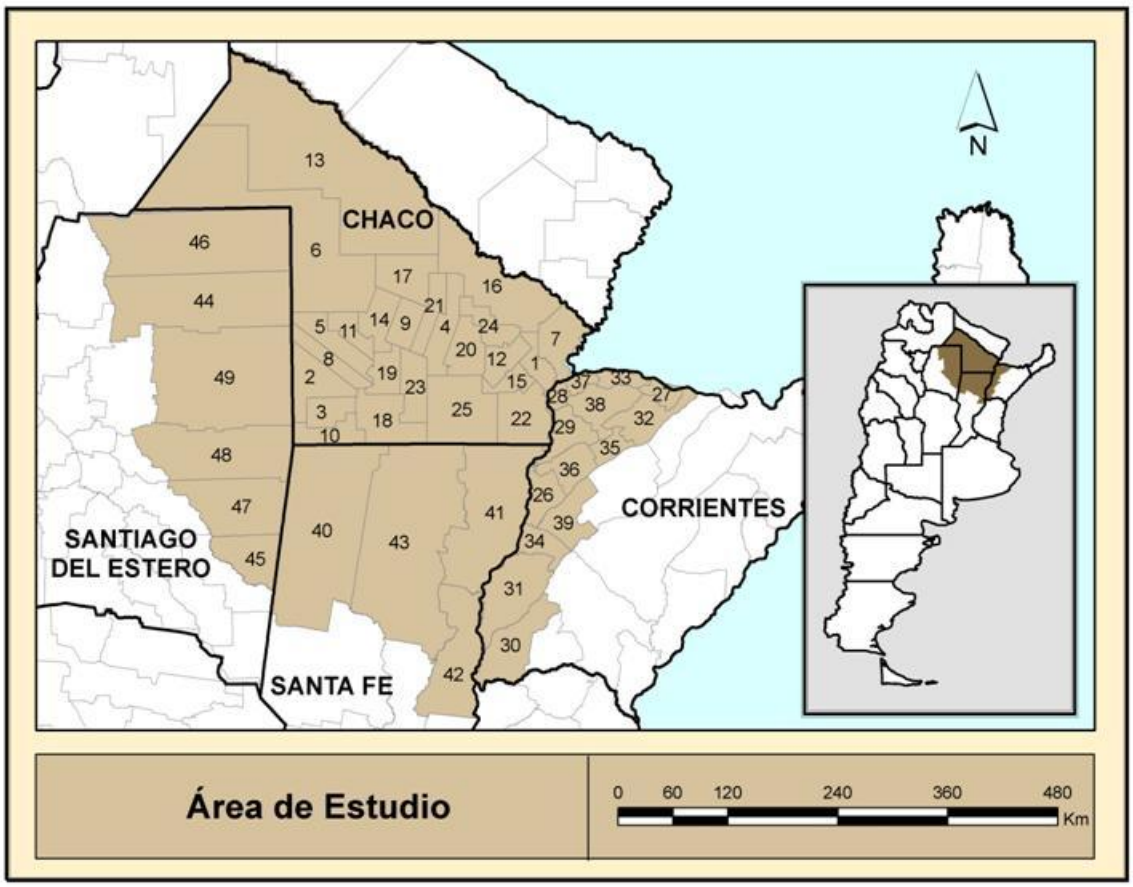
The prevailing exploitation of native forest in the Departments of Copo and Alberdi does not preclude production activities related to large and minor livestock from being conducted.

The production model west of the Departments of Moreno and Juan F. Ibarra, belonging to the region known as “Chaco Seco” [Dry Chaco] - although geographically near the Departments of Copo and Alberdi - is also related to the exploitation of native vegetation, although to a lesser extent if compared with Santiago del Estero’s departments comprising the Humid Chaco. However, all the departments comprising the Dry Chaco do feature more presence of large and minor livestock production, especially to the west, and in farming units related to small producers, with herds of less than fifty heads of livestock.

Lastly, a strong production structure can be observed to the east of the Dry Chaco departments, especially in the Departments of Gral. Taboada and Belgrano, related to rain-fed agriculture, such as soybean growing, in top position, followed by the growing of cotton, sorghum, corn, and, to a lesser extent, beans. It is worth mentioning that the prevalence of rain-fed agriculture does not preclude the presence of agricultural production units (EAP) related to livestock farming, as it is possible to find mixed production structures within the same EAP.

Descripción del área de intervención

This area of study belongs, to a large extent, to the Humid and subhumid 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 Edtith Scheinkerman de Obschatko (Agreement MAGyP-IICA). For such reason, the indicators mentioned next apply to this area.



Province	Area (ha)
CORRIENTES	2,726,394
SANTIAGO DEL ESTERO	6,236,024
SANTA FE	5,592,517
CHACO	9,978,132
TOTAL	**24,533,066**

PROVINCE	DEPARTMENT	MAP CODE	AREA (ha)	POPULATION		
				Total	Con NBI	%
CHACO	1 DE MAYO	1	129,975	9130	2643	28,90
CHACO	12 DE OCTUBRE	2	289,681	20105	7765	38,60
CHACO	2 DE ABRIL	3	152,522	7418	2757	37,20
CHACO	25 DE MAYO	4	234,769	28006	12886	46,00

PROVINCE	DEPARTMENT	MAP CODE	AREA (ha)	POPULATION		
				Total	Con NBI	%
CHACO	9 DE JULIO	5	219,599	26878	9859	36,70
CHACO	ALMIRANTE BROWN	6	1,874,672	29040	13110	45,10
CHACO	BERMEJO	7	273,848	24116	8228	34,10
CHACO	CHACABUCO	8	155,585	27664	7915	28,60
CHACO	COMANDANTE FERNÁNDEZ	9	150,285	87,158	24969	28,60
CHACO	FRAY JUSTO SANTA MARÍA DE ORO	10	181,150	10,419	4137	39,70
CHACO	GRAL BELGRANO	11	131,098	10,457	4933	47,20
CHACO	GRAL DONOVAN	12	154,567	13,341	4752	35,60
CHACO	GRAL GÜEMES	13	2,645,338	61,936	33987	54,90
CHACO	INDEPENDENCIA	14	193,244	20,574	10014	48,70
CHACO	LIBERTAD	15	101,850	10,767	3135	29,10
CHACO	LIBERTADOR GRAL SAN MARTÍN	16	739,906	54,288	24152	44,50
CHACO	MAIPÚ	17	292,419	24,708	10724	43,40
CHACO	MAYOR LUIS J FONTANA	18	331,894	53,341	17540	32,90
CHACO	O'HIGGINS	19	156,838	19,207	9143	47,60
CHACO	PRESIDENCIA DE LA PLAZA	20	222,751	12,183	4502	37,00
CHACO	QUITILIPI	21	160,737	32,017	12555	39,20
CHACO	SAN FERNANDO	22	344,134	362,726	79329	21,90
CHACO	SAN LORENZO	23	217,393	14,234	6449	45,30
CHACO	SARGENTO CABRAL	24	160,900	14,989	6072	40,50
CHACO	TAPENAGA	25	549,720	4,180	1798	43,00
CORRIENTES	BELLA VISTA	26	178,915	35,231	10901	30,90
CORRIENTES	BERÓN DE ASTRADA	27	89,289	2,290	946	41,30
CORRIENTES	CAPITAL	28	59,765	326,765	69228	21,20
CORRIENTES	EMPEDRADO	29	205,477	14,657	5402	36,90
CORRIENTES	ESQUINA	30	397,792	30,197	11417	37,80
CORRIENTES	GOYA	31	476,342	86,948	25192	29,00
CORRIENTES	GRAL PAZ	32	259,018	14,720	5433	36,90
CORRIENTES	ITATÍ	33	85,760	8,717	2473	28,40
CORRIENTES	LAVALLE	34	148,400	26,206	10358	39,50
CORRIENTES	MBURUCUYÁ	35	99,387	8,970	3585	40,00
CORRIENTES	SALADAS	36	192,210	21,435	8721	40,70
CORRIENTES	SAN COSME	37	60,732	13,099	4034	30,80
CORRIENTES	SAN LUIS DEL PALMAR	38	259,691	16,456	6193	37,60
CORRIENTES	SAN ROQUE	39	245,084	17,911	7487	41,80
SANTA FE	9 DE JULIO	40	1,733,258	28,189	8758	31,10
SANTA FE	GRAL OBLIGADO	41	1,103,838	165,767	43836	26,40

PROVINCE	DEPARTMENT	MAP CODE	AREA (ha)	POPULATION		
				Total	Con NBI	%
SANTA FE	SAN JAVIER	42	669,519	29,721	8968	30,20
SANTA FE	VERA	43	2,070,325	50,881	16333	32,10
SANTIAGO DEL ESTERO	ALBERDI	44	1,224,496	15,504	7667	49,50
SANTIAGO DEL ESTERO	BELGRANO	45	319,912	7,927	2167	27,30
SANTIAGO DEL ESTERO	COPO	46	1,412,580	26,924	11718	43,50
SANTIAGO DEL ESTERO	GRAL TABOADA	47	630,054	36,372	13817	38,00
SANTIAGO DEL ESTERO	JUAN F IBARRA	48	916,355	16,926	8071	47,70
SANTIAGO DEL ESTERO	MORENO	49	1,638,781	27,933	12114	43,40

Table: Surface area per district, total population and population with Unsatisfied Basic Needs (NBI)

According to Scheinkerman de Obschatko (2009:10-19), a family-based agricultural production unit (or family EAP in Spanish) covers 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 EAPs (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. 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.

As regards production units of the province of Santiago del Estero, it can be said that out of a total 15,000,000 hectares, the surface area related to agricultural production covers a third part, being 5,393,633 hectares spread among 20,949 agricultural production units (EAP). If we consider specifically the situation of small producers, 83% of all EAPs (17,453) belong to producers with an average surface area of about fifty hectares, merely representing 16% of the production surface area.

However, the entire region shows similar characteristics in terms of low-efficiency calves production, forage deficit caused by recurring droughts, low application of droves 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 districts[1] related to the geographic area of the project this indicator ranges between 26.4% (General Obligado, Corrientes) and 49.5% (Alberdi, Santiago del Estero), 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

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

– 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.

Santiago del Estero: the Humid Chaco region features a strong percentage of population with unsatisfied basic needs, attaining 43.5% in the Department of Copo, and 49.5% in the Department of Alberdi. Also, both departments feature similar, low illiteracy (6.7% and 7.4%, respectively) and population density (2.5% and 1.3%) rates. Lastly, in both departments, male population prevails as opposed to female population, with male population being higher by 8.1% in Copo and by 10% in Alberdi.

For the case of the Departments of Moreno and Juan F. Ibarra, the UBN have similar values as for Departments of Copo and Alberdi. This consistency between UBN values is mostly related to nearly identical production structures for the four departments above mentioned, which have exploitation of native forest with little added value as primary activity, and in a subsidiary manner livestock production activities are developed.

As regards the Departments of Gral. Taboada and Belgrano, they both feature lower values in terms of UBN (38% and 27.3% respectively). This might have to do with the fact that both departments feature production activities more related to rain-fed agriculture and a higher development of livestock activities.

Furthermore, all departments of the Dry Chaco have similar illiteracy and population density values except for the Department of Belgrano, which has an illiteracy rate slightly lower than average (4.6%), and the Department of Gral. Taboada, which has a higher population density (6.3%). Lastly, except for the Department of Gral. Taboada,

which features a slightly higher female population rate (0.6% more than male population), the rest of the departments show a higher presence of male population as opposed to female population (by approximately 5% more).

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.

It can be averred that the activities related to minor livestock activity are usually performed by women mostly, who feed, take care of and milk the animals. Alongside such activities female producers are also in the care of producing cheese out of goat milk, assisted by the daughters of each family group, in those cases where they do not conduct any off-farm activity. Men are usually the ones slaughtering minor livestock.

Besides being in the care of such activities, women are the ones normally making decisions regarding production and marketing of minor livestock.

In cases where larger animals are owned, such as cattle, men are usually responsible for their care. Furthermore, it is also customary that men should be the ones conducting off-farm work, in many cases, of a temporary nature.

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.

According to PROINDER (2010:17), the communities settled in the province of Santiago del Estero and recognized by the National Institute of Indigenous Affairs include the **Diaguita-Calchaquí** community, the **Tonocoté** community and the **Vilela** community. However, based on several works conducted in the province, the Inclusion and Rural Equity Area has found the presence of other communities as well, including the Lule-Vilela, Sanavirón, Guaicurú and Diaguita Cacán communities.

It is worth mentioning that up to this date, no broken-down statistical information has been found, which might allow to identify the different aboriginal communities per Department of their location or which would allow to know the quantity of aboriginal settlers in each Department or specific work conducted by each community.

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.

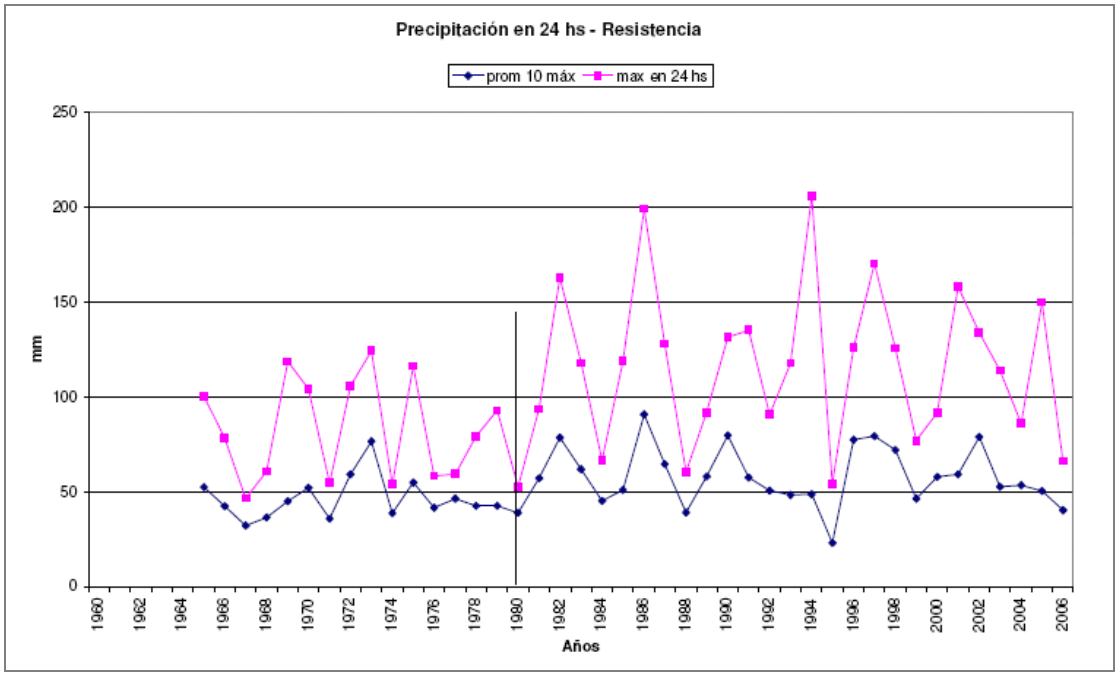
Different approaches and study methodologies may be applied in a subsidiary manner to characterize the influence of climate change over a certain area, including those based on the analysis of temperature and precipitation tendencies from recorded data both regarding changes of average values and extreme values, or approaches based on the analysis of projected changes. Furthermore, the influence of climate and variability may be accounted for through observations of changes of the different aspects of vegetation through remote sensing information.

Water availability: observed changes in precipitation

Water availability throughout the year is strongly dependent on summer rainfall, especially 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 great inter-annual variability is one of the main reasons of failure of many production systems of the small-scale agriculture producers across the area of intervention. 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 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%

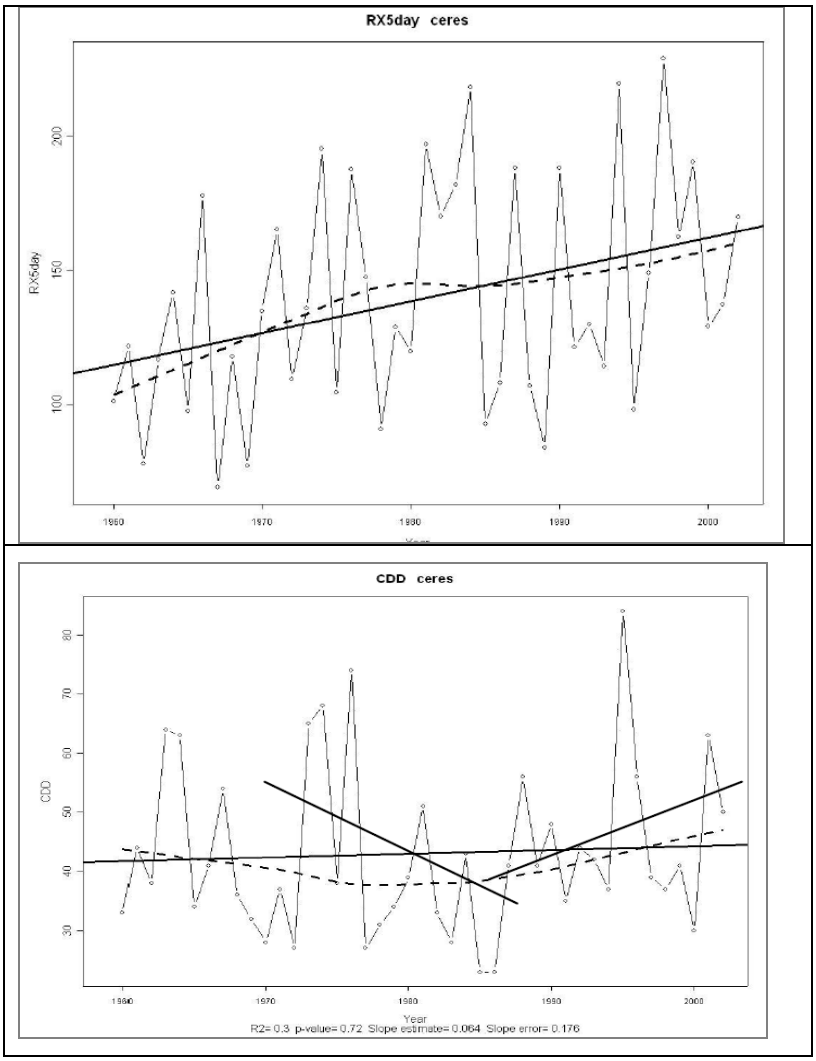
There is evidence to the fact that storms - though increasingly lesser in terms of spatial coverage - have been more intense locally over the last years. The following graph (Marino 2007) shows the increase recorded in Resistencia (Chaco) in the maximum amount of rainfall for 24 hours recorded each year.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



The charts below pertain to a different time scale. The first chart 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.

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

In the chart below 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.



Maximum precipitation accumulated during 5 running days at the meteorological station of Ceres, and the number of running days without rain for the area. 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 (especially 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 and 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, especially 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.

Changes in 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).

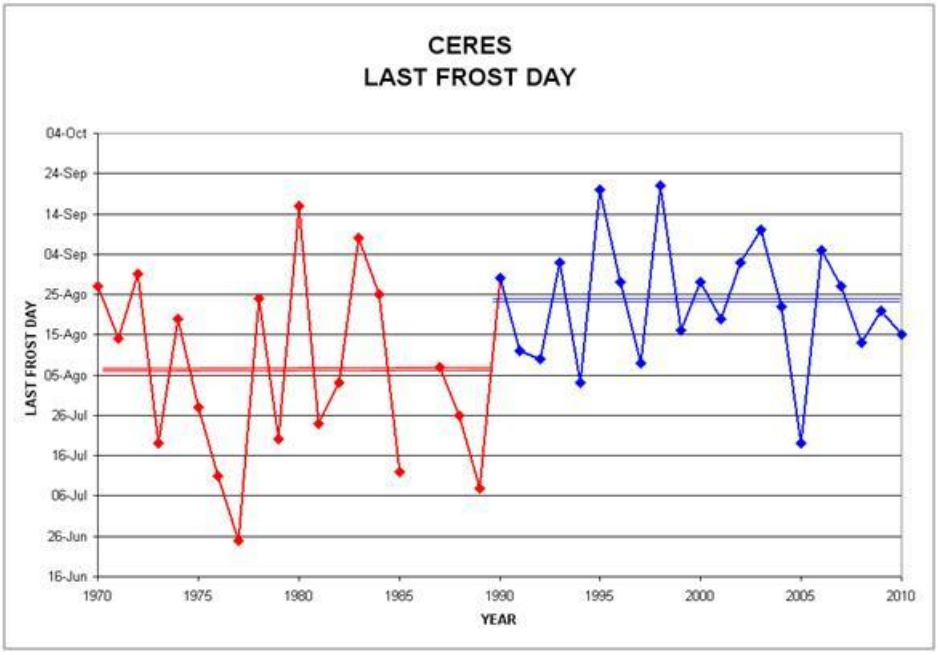
The greatest social-economic impacts are due to climatic extremes rather than to progressive changes in the mean values of climate variables. No remarkable changes have been found to occur over the last years in Argentina's northeast in the mean values of temperature. However, changes have indeed been 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 35ºC temperature was never attained (1991) and with another year where 43 days were recorded with temperatures in excess of the former value (2008).

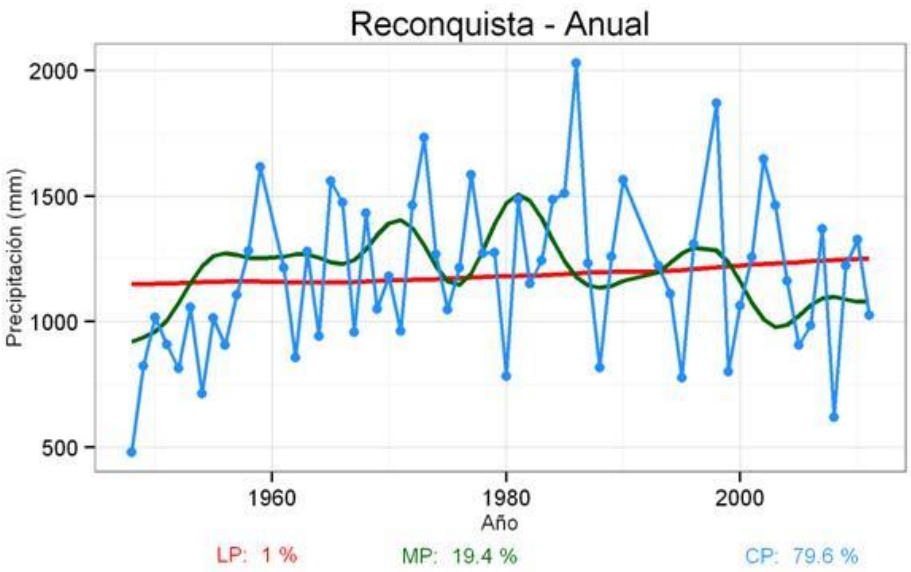
Short, mid and long term climate variability in the project's area

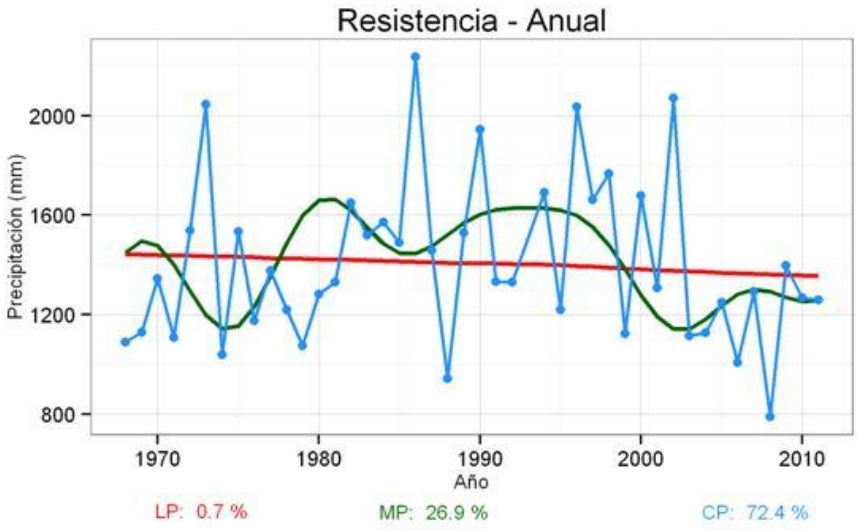
The world' climate system has different processes causing variability at different scales, both temporal and spatial scales. Based on variation over time, there are short, mid and long term variations. Short-term variations are connected to inter-annual variations; mid-term variations are connected to phenomena occurring in 8 to 40 year long cycles; and long-term is connected to the increase in world temperature. The breaking down of variability into these 3 components is highly useful when quantifying and prioritizing impact studies and potential adaptation measures to allow to mitigate negative impacts and enhance positive impacts of climate variability.

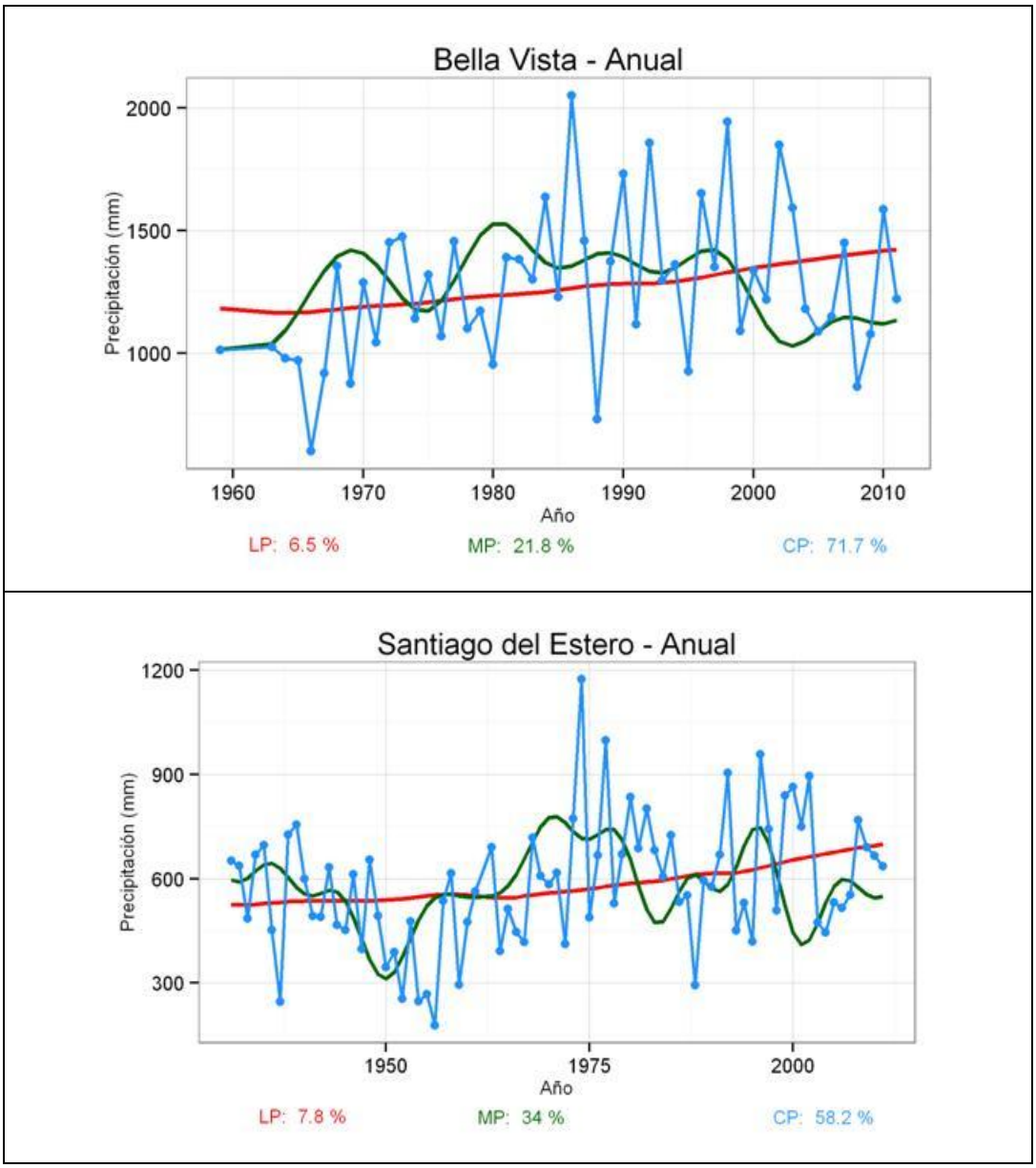
The evolution of annual precipitation and the temporal components of its variability were analyzed across 4 meteorological stations located in the provinces of Corrientes, Chaco and Santiago del Estero (Table 1). The methodology used to break down climate variability in its short, mid and long term components is that recommended by the IRI (International Research Institute for Climate and Society, Univ. De Columbia) (Greene, A.M, et. al, 2011) and is based on the statistical analysis of temporal series. It comprises 2 stages. The first one is based on a simple regression using a series showing increase in global temperature deriving from a general circulation models ensemble with the purpose of identifying and removing the long-term tendency connected to climate change. This approach is based on the assumption that the value of climatic variables does not change simply as the result of time, but that these changes are due to global warming. The second stage consists in determining decade-scale variability or long-term variability, obtained by applying a low-frequency filter (Mann, ME, 2004) which allows to contemplate all fluctuations with a frequency higher than 8-10 years, thus allowing cycles connected to ENSO phenomena to be included in the short-term variability.

Station	Province	Period	Observed (mm)	*Long term*	*Mid-term*	*Short term*
Bella Vista	Corrientes	1959-2011	1273.6	***6.5***	***21.8***	***71,7***
Reconquista	Santa Fe	1948-2011	1186.9	***1***	***19.4***	***79.6***
Resistencia	Chaco	1968-2011	1403.4	***0.7***	***26.9***	***72.4***
Santiago del Estero	Santiago del Estero	1931-2011	583.2	***7.8***	***34***	***58.2***

Taking all 4 stations analyzed, it can be observed that the component relevant to inter-annual variability or short-term variability is the one with more weight on data variance, contributing 70.5% in average, with values ranging from 58 to 80%. Meanwhile, mid-term variability has a 25.5% share, with variations ranging from 19 to 34%, and lastly, the long-term component, connected to climate change, represents a 4% share in data variability, ranging from 0.7 to 7.8%.


Reconquista - Anual
Precipitación (mm)
2000
1500
1000
500
1960
1980
2000
Año
LP: 1 %
MP: 19.4 %
CP: 79.6 %


Resistencia - Anual
Precipitación (mm)
2000
1600
1200
800
1970
1980
1990
2000
2010
Año
LP: 0.7 %
MP: 26.9 %
CP: 72.4 %



INTA, 2012. Annual rainfall evolution and temporal components of climate variability (Long, mid and short term).

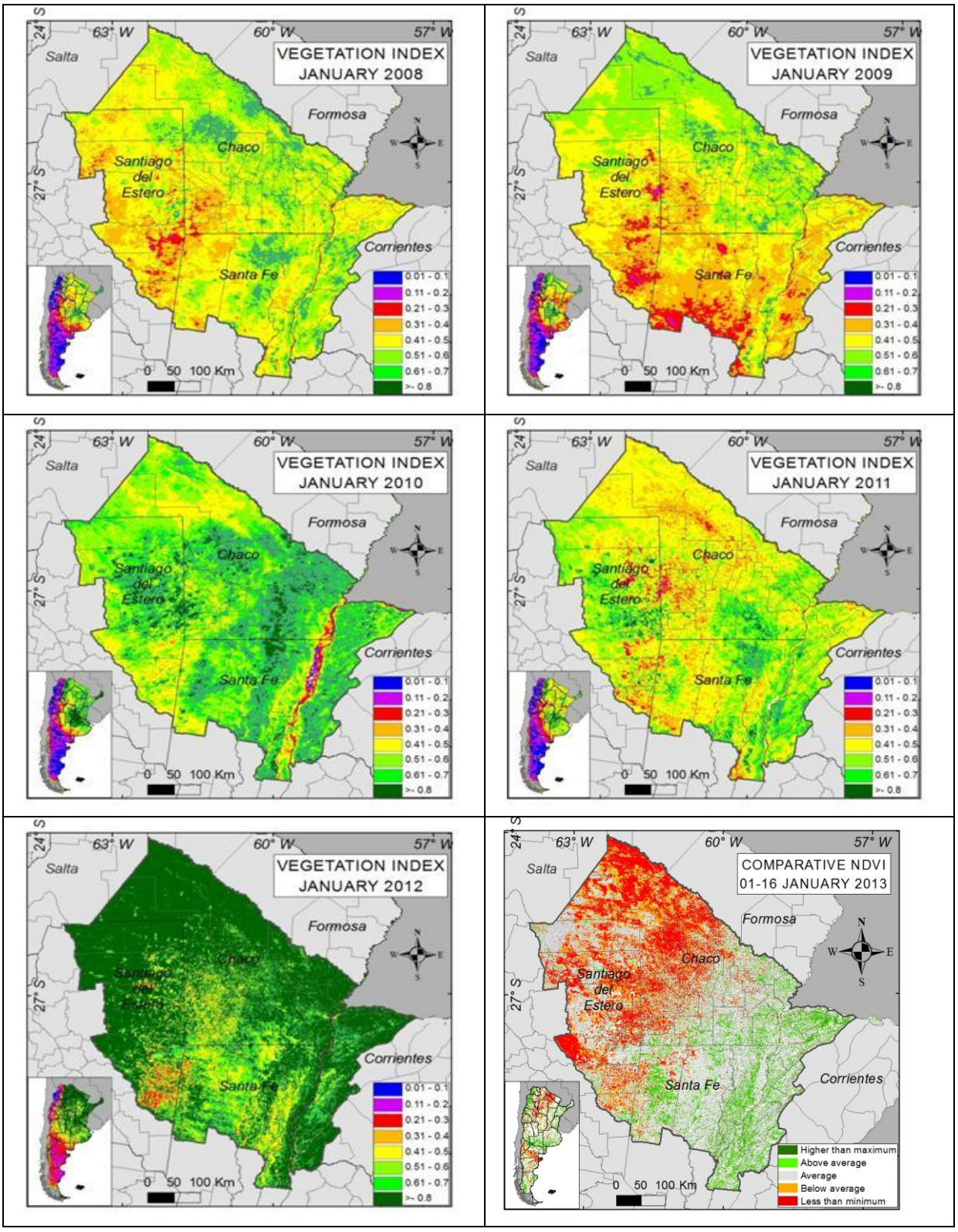
This analysis is important because it shows that across the entire area of intervention, *the strongest climate influence is connected to its variability, particularly, its inter-annual variability, causing huge variations* as far as water availability from rainfall is concerned. Even with various annual precipitation records within the area of intervention, this inter-annual variation, or even variation within the same season, poses the main constraint and control of the production systems of the region, turning difficult access to water into the main constraint for production purposes and for the different uses of water across the defined area.

Monitoring vegetation response to inter-annual climate variability

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.

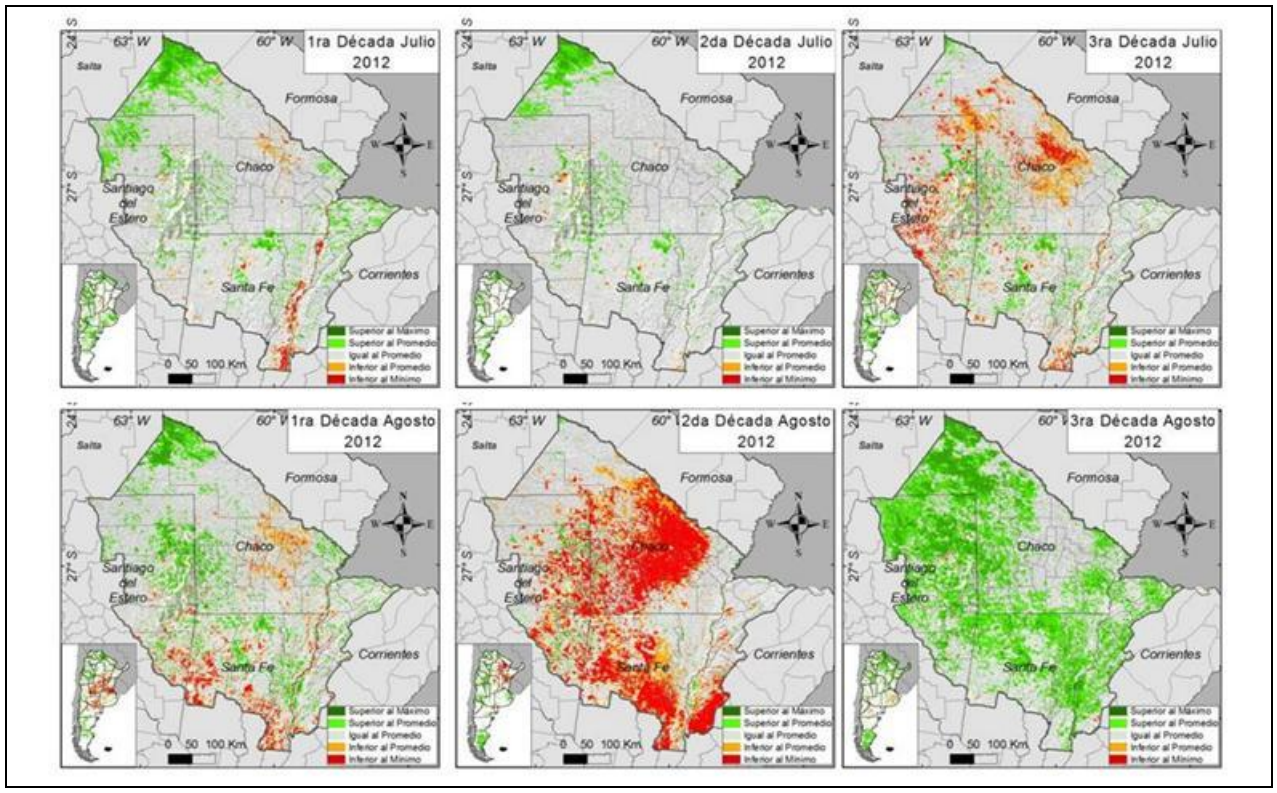
Vegetation indexes (NDVI) help follow the condition every week or month period and shows the great variability of the vegetation photosynthetically active across different time scales throughout different times of the same year. The monthly analysis of such indexes show great variability found in this region within similar growing seasons, and between years. This variable behavior is directly connected to variation in water availability.

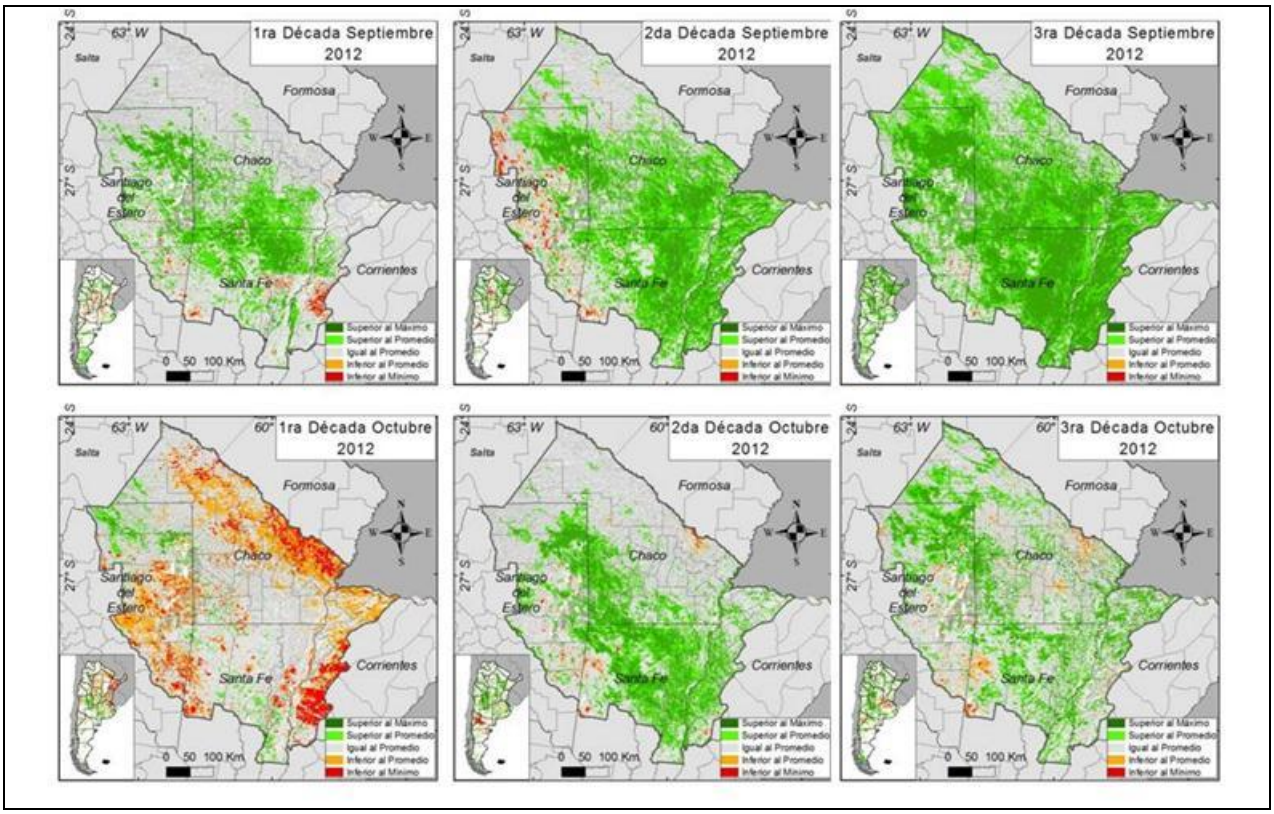
The analysis of the comparative NDVI of the last five summers is an example of this high inter-annual variability. The figures show in red and yellow color pixels with a vegetation index value less than the average values of NDVI. Green means better canopy cover, crop biomass and vigor.



INTA Climate and Water Institute (2012), NDVI map composites of the last six years during January, summer season, as a demonstration of the impact of the inter-annual climate variability on the vegetation of this area during recent years (January 2013 first 15 days).

The analysis of the comparative NDVI of the last season is an example of this high inter-annual variability. The figures show in red pixels with 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 means better than the average.





INTA Climate and Water Institute (2012), Time series of monthly NDVI images for 2012, as a demonstration of climate variability, shows the high spatiotemporal variability across this area. Pixels in red show a weak vegetation response, green means growing vegetation.

Regional vulnerability to climate extremes

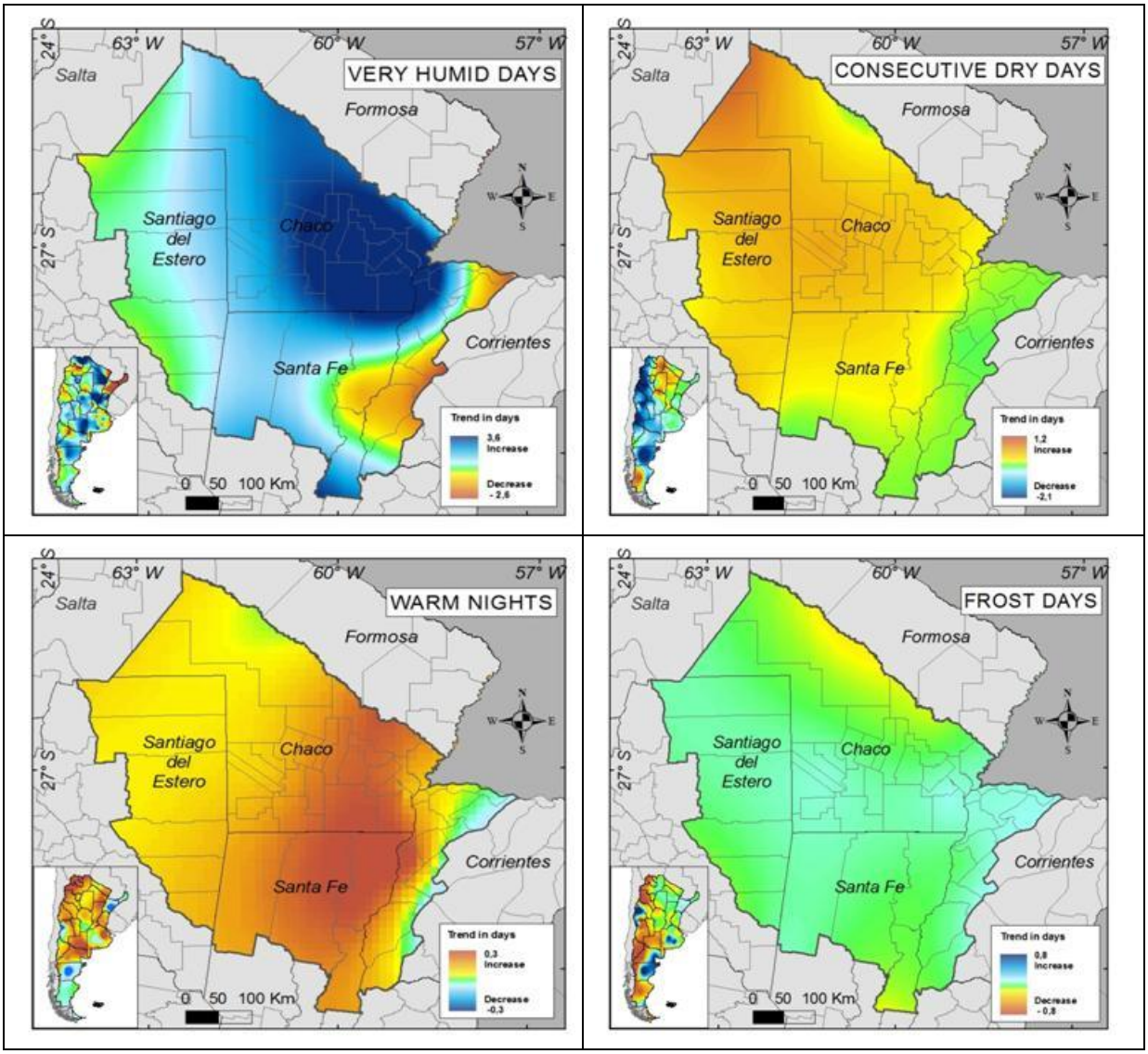
Climate trends related to vulnerability have been analyzed over the area of interest considering tendencies observed during the last 50 years at official stations of extreme climate values, such as precipitations above the 95% percentile (very humid days), consecutive days without rain (dry days), days with frost and days with warm nights, 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 analyze tendencies and to apply adaptation measures in the face of climate change.

The 1961-2000 tendency for “days with frost” in the region shows a slight decrease towards the north, of moderate significance. On a large scale, it is concluded that there would be no significant variation in the number of days with indoor temperatures below 0ºC.

One of the factors observed over the last years is the increase in minimum temperature. “Warm nights” means minimum temperatures above 95th percentile, that is, the highest minimum temperatures. The tendency observed is an increase during the 1961-2000 period in the region. As regards “consecutive dry days”, or days without precipitation, it is observed that, to the east of the region, there are no significant changes during the

1961-2000 period. In turn, the center and west areas of the region, an increase in the number of dry days is observed. However, it is worth mentioning that when studying the index of “very humid days”, that is to say, daily precipitation above the 95th percentile, an increase can be observed in the 24-hour precipitation in the same region. Therefore, more consecutive rainy days are observed, and considering a precipitation event in itself, it is more intense (amounting to a higher 24-hour accumulated value).

Towards the southeast of the region, the tendency of “very humid days” would suggest a decrease of the accumulated daily precipitation value.

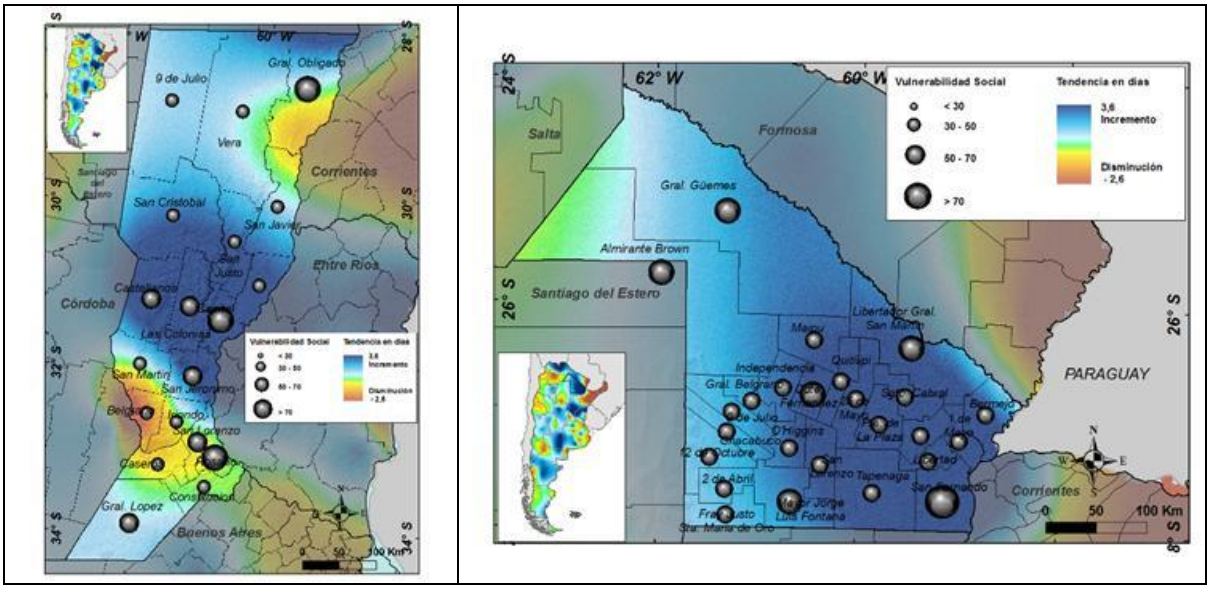


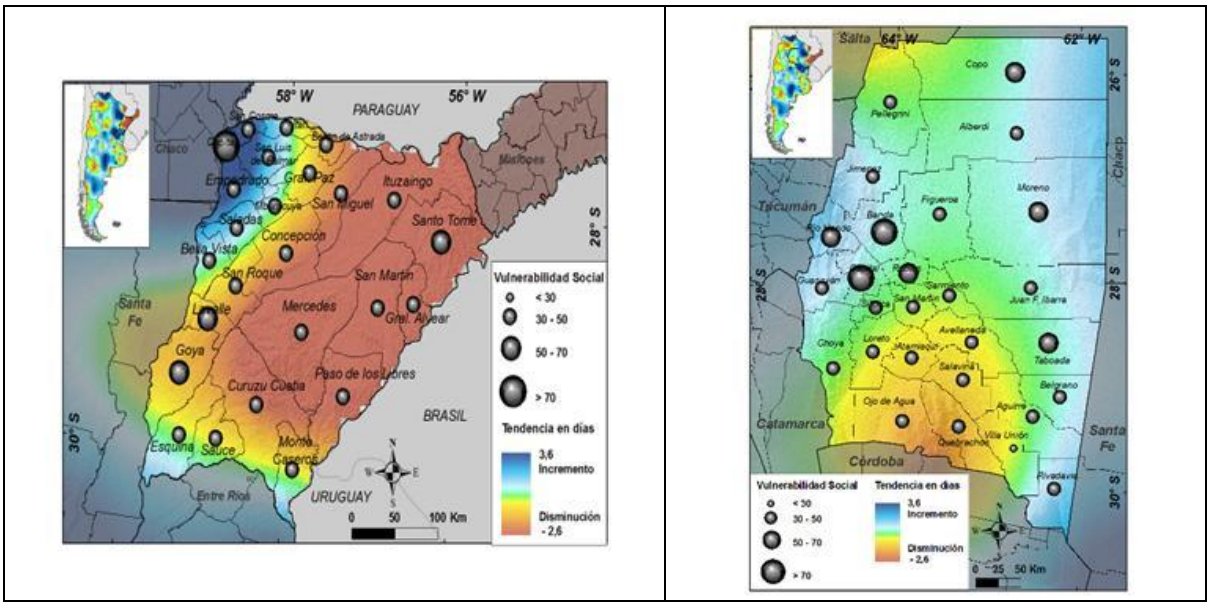
Climate extreme indexes in the area of study: precipitations above the 95% percentile (very humid days), consecutive days without rain (dry days), days with warm nights and days with frost. Indexes for the observation of tendencies applied on the area of interest as defined by the CLIVAR project (www.clivar.org)

Combined vulnerability: Climate and Social Indicators

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 were 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.

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.



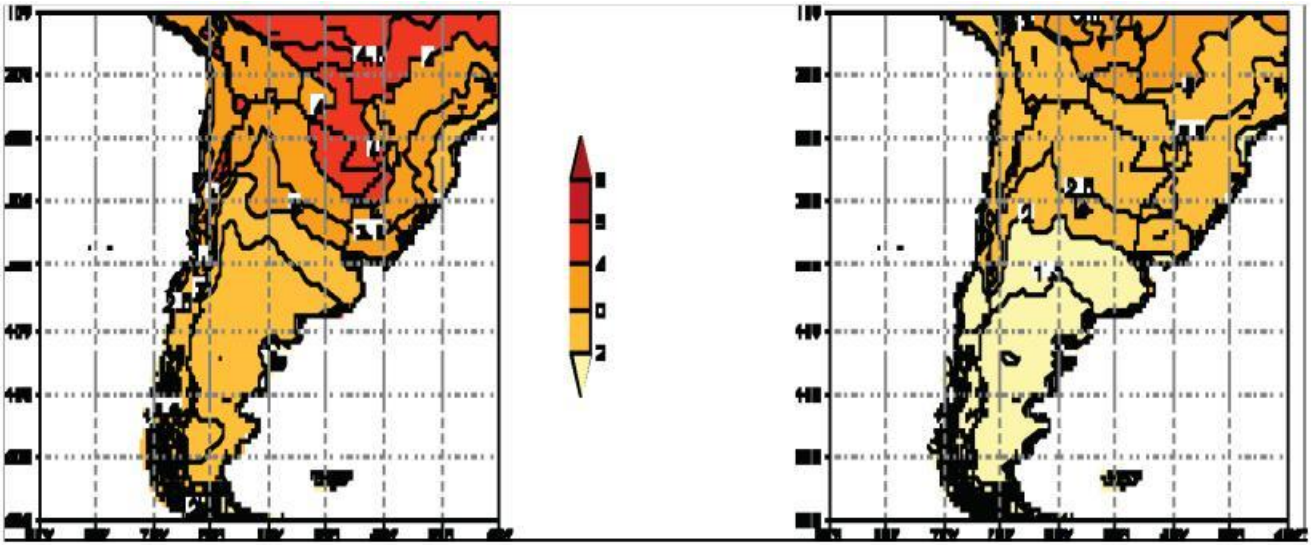


INTA & DCC SAyDS (2012), Combined analysis of social indicators (circles meaning social vulnerability of the district), superimposed on the colored maps related to very humid days (trend in precipitations above the 95% percentile) with the blue areas meaning an increase in the very humid days.

Projected climate change

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; by more than 4 °C in the A2 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.



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.

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

[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.

are forecast for the winter season, it is expected that cattle ranching would be especially impacted[5]

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

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

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.

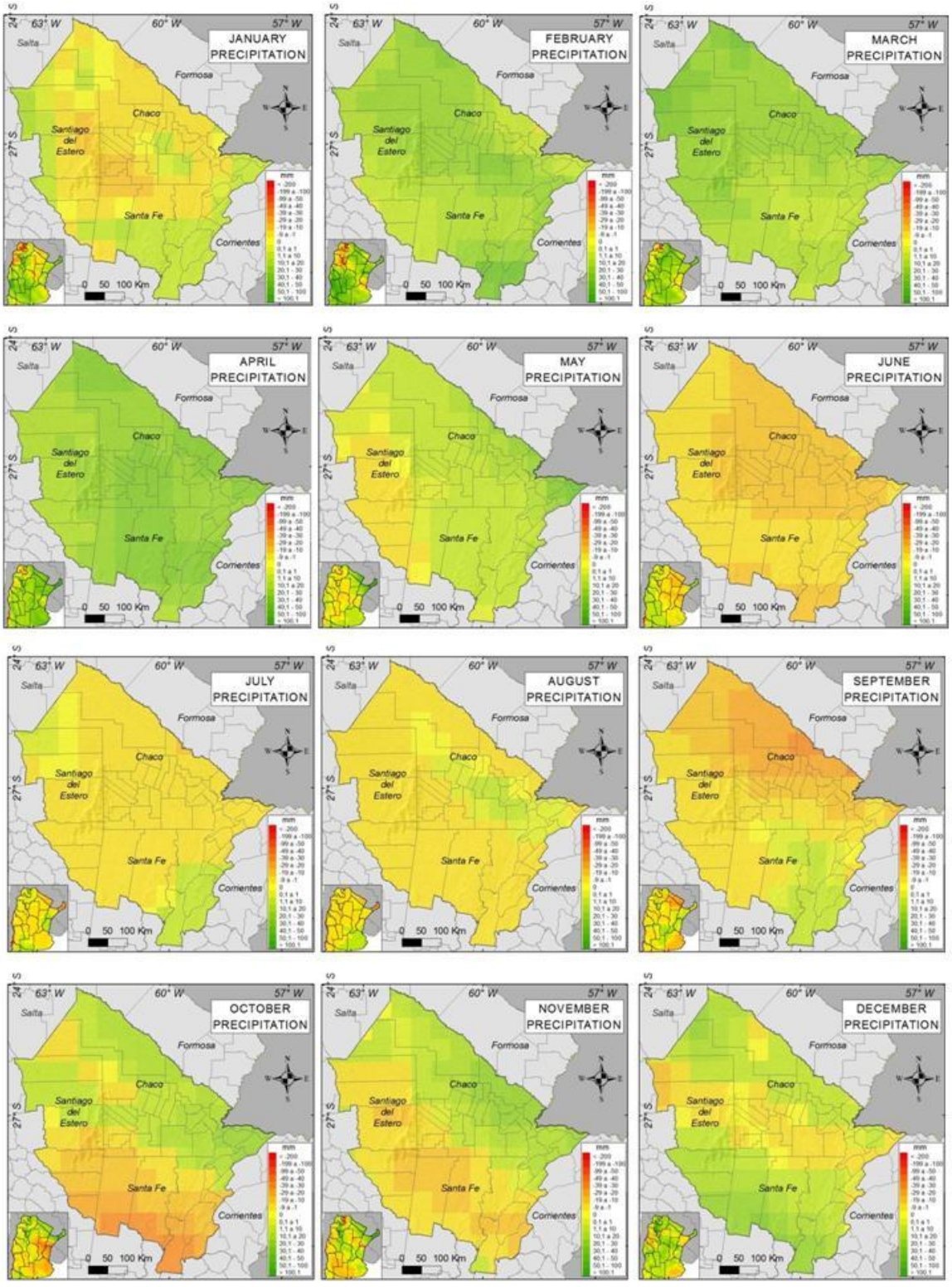
In addition, floods originated in rainfall would also rise because the frequency and intensity of the meso-scale convective system on account of climate change is expected to continue rising (since 1970s).

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.

<u>Projected changes of temperature and precipitation extremes in the area of interest</u>

Using the PRECIS regional climate modeling system, the distribution of extremes of temperature and precipitation in South America in the recent past (1961-1990) and in the future (2071-2100) climate under the IPCC SRES A2 and B2 emission scenarios (Marengo et al, 2008) is analyzed over the area of the project.

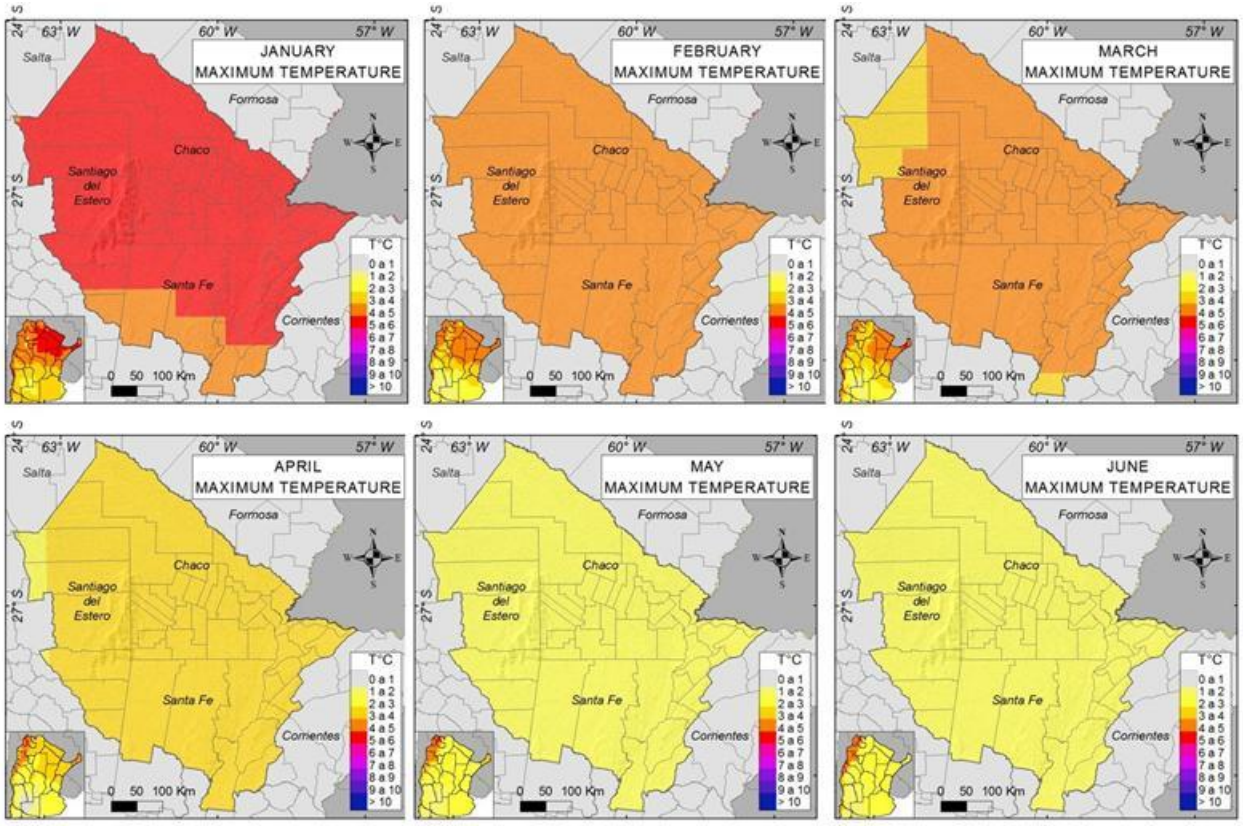
The analysis of the anomaly in monthly precipitation - 2071-2100 / 1961-1990 - shows an increase in precipitation for the 2071-2100 period during February, March and April across the region. Towards the end of May, an increase is observed in precipitation, but not across the entire region.

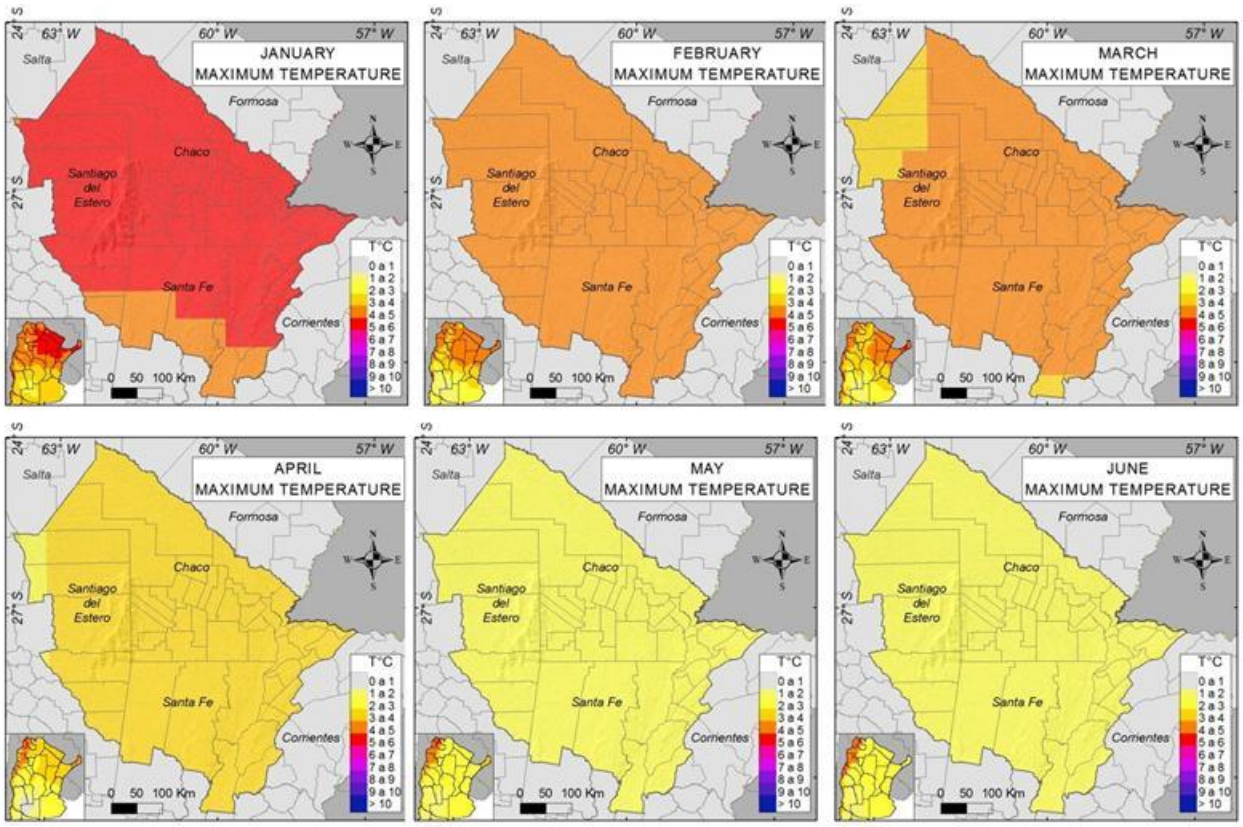


Projected changes in the monthly rainfall (mm) in the area of intervention for 2071/2100 relative to 1961/1990 based on the PRECIS-INPE regional model. The maps have been prepared using the PRECIS regional climate modeling system in South America under the IPCC SRES A2.

In winter months, a slight decrease in precipitation is observed. Towards the spring, again, an increase in precipitation is observed to the north of the region, but to the south, declining precipitation continues to be the case. Towards December and January, the negative anomalies (lesser precipitation) migrate northwards.

Overall, both maximum and minimum temperatures go up towards the end of the century. The biggest changes are observed in maximum temperatures, particularly during the summer months, across the entire region, and in August and September, towards the north. In terms of minimum temperatures, a homogenous increase is observed for the entire region, except for January when a higher increase is recorded in the south of the region.





Projected changes in the monthly temperature fall (mm) in the area of intervention for 2071/2100 relative to 1961/1990 based on the PRECIS-INPE regional model. The maps have been prepared using the PRECIS regional climate modeling system in South America under the IPCC SRES A2.

PROJECT / PROGRAMME OBJECTIVES:

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:

Taking into account the proposed strategic and methodological framework, the project components, expected concrete outputs, expected outcomes and corresponding amounts are presented in the table below.

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 Implementation of improvements in the efficient use, catchment, harvesting, and storage of water in the areas of intervention	Improvements in the use and productivity of water for family agricultural producers.	1,428,171
	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	Reducing the variability in income inflow of family agricultural producers, promoting their continuity in the activity and in rural settings.	1,250,142
	1.3 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.	645,868
2. Strengthening of information, monitoring and climate information management systems	2.1 Integration and expansion of the project area'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 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.	653,500
	2.2 Development of an integrated Early Warning and Decision-making system to assess and manage climate risks, including extreme events		750,870
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.	270,000
	3.2 Training and formation addressed to municipal and provincial governmental units for hydrometeorological		196,250

	management and monitoring, analysis of climate information, use of methodological tools and development of modules of adaptation		
4. Project/Programme Execution cost			280,000
5. Contingency costs			165,000
6. Total Project/Programme Cost			5,640,000
7. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			N/A
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	July 2013
Mid-term Review (if planned)	December 2014
Project/Programme Closing	July 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 rural population in the region is highly vulnerable and requires adaptive measures, particularly in relation to water management, organization and risk and knowledge management. Although the inhabitants have expressed that they notice the impacts of climate change, like the variation in the hydrological cycle, the occurrence of extremes temperatures below 0ºC and above 50ºC, among other related aspects, the lack of information and of adaptation proposals in the face of these circumstances is clearly observed.

In turn, climate change, soil erosion and deforestation further intensify the conditions of vulnerability of the rural population causing their agricultural and livestock production to decrease, and in consequence, food safety becomes threatened and their economic income drops.

Climate change is evidenced in the provinces chosen for project execution by temperature variation and volume of rainfall. An early start or delay of the rainfall season was noticed, as well as an increase in intensity and an extended absence of rainfall (several months without raining), the presence of increasingly harmful frost and unexpected temperature increases. These alterations are seen as constant and persistent problems by small-scale producers.

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. During the first phase of the Project execution, procedures and training on participatory management mechanisms will be provided to ensure the engagement of the beneficiaries throughout the full cycle

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 U$ 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.

Output 1.1 Implementation of improvements in the efficient use, catchment, harvesting and storage of water in the areas of intervention

The main problem that producers in the project area 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 carrying 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.

If we take into account the opinion of producers, there already is a water shortage as human activity in the region historically depended on the volume of rainfall without factoring in storage works or regulation, save in specific cases. The constant wait for rainfall is the greatest vulnerability factor in the face of climate variability of agricultural rural populations.

Therefore, the rural populations of the 4 provinces identify the need to provide for water availability for overall use (that is, human consumption, animal watering and irrigation) on an urgent basis.

Below is a description of the adaptive measures proposed in relation to water resources based on the agroecological and climate characteristics of the region.

1.1.1. Drilling of boreholes to access underground water in quantity and quality

When the underground water is not accessible or its physical and chemical qualities render it unsuitable, boreholes will be drilled based on prior geoelectrical prospecting studies supported by satellite images that show the potential drilling locations, boreholes and wells lined with casing already present in the different territories will be checked, pumping tests will be conducted to study their potential, and lab analyzes will be performed on their chemical quality.

Water suitability will be assessed for the different uses. If the underground water is suitable for multiple uses, the most appropriate drilling system (manual, manual-mechanical or mechanical drilling) will be determined based on the location, the maximum depth and the need of a pre-filtering system.

In each case, it will be important to know the design flow (the maximum flow that can be extracted on a sustainable basis). Based on this information, on the demand and on the characteristics of the population involved, the most adequate pumping system will be assessed and determined for each borehole drilled, choosing among: windmill, submersible electric pump, etc. In any of the above cases, the system will be supplemented with an elevated storage tank (enabling 3 or more days of reserve in the case of windmills) plus a trough system for animal watering. There may be individual or community wells depending on the specific case.

These boreholes will be drilled by means of a rotatory mechanical system that will make the underground wells to obtain water for human consumption, animal watering and irrigation.

The targeted populations will the indigenous communities of Pampa del Indio and the farming families belonging to small-scale producer associations of the 4 provinces.

These activities involve over 138 families and will be developed in the provinces of Chaco, Santiago del Estero, Santa Fe and Corrientes.

In Chaco, wells will be drilled in Pampa del Indio, General San Martín Department and in Parajes El Arenal and Los Arenales, Las Breñas, 9 de Julio Department; in Santiago del Estero, in the town of Santa Rosa, Moreno Department; in Santa Fe, in General Obligado Department; in Corrientes, in Goya Department.

These activities will allow producers to have some predictability in order to sustain agricultural and livestock production by having water availability for overall use during a longer period throughout the year. The producers that will have access to this component are 90% type A and type B producers, and 10% type C producers.

1.1.2. Design, conditioning and construction of roofs retrofitted for rainwater catchment, and construction of associated cisterns to be used as reservoirs

Rainwater catchment is a valid alternative in such areas where rainfall is capable of meeting the water demand for certain priority or defined uses.

Rainwater can be collected and routed to storage to save it for later use. In these cases, the catchment system consists of the roofs of the houses that are improved and made impervious, downspouts, filters and reservoirs or cisterns in family backyards as storage means.

In places where the underground water is not suitable for use for its high salt content, rainwater will be the only source of available water. Harvested water may be used both for human consumption and animal watering, as well as for micro-irrigation in family orchards.

In this case, an evaluation will be made of the condition of the existing roofs of the houses and improved, when necessary, with sheets or the ferro-cement technique, or by building a roof structure formed by galvanized sheets that can be installed in any place and then disassembled to be then reassembled in another place as required.

Cisterns will also be built of masonry or ferro-cement to harvest water. Plastic tanks can also be used. The size of the cistern will depend on the daily demand, the number of users and the uses to be given to the harvested water.

For the stored water to be clean and safe (free from pathogenic germs), a pre-filtering and a filtering system will be installed. Then the water can be boiled or disinfected with chlorine. The treatment with chlorine can be carried out directly in the cistern.

Cisterns will also be equipped with pumps so as to maintain the water storage in accordance with health regulations, avoiding the risk of turning the water storage into a source of disease dissemination.

Whenever possible, the storage systems will be buried due to several reasons, such as to preserve the lowest temperature possible of the stored water.

In the case of community wells, a regulation governing its use will need to be drafted setting out the rights and obligations for water use, system operation and maintenance. This must be performed at each site, and be discussed and agreed by the producers who will use the system.

This activity involves 266 families, of which 50 belong to the indigenous population, and will be developed in the provinces of Santa Fe, Chaco and Santiago del Estero. Its beneficiaries are primarily type A and type B producers.

In Santa Fe, the activity will focus on Santa Lucía, Tartagal and Garabato, Vera Department. In Chaco, on Campo Medina, Santa Rita and Laguna Lobo, Libertador General San Martín Department; General Pinedo, Gancedo, Pampa Landriel, Pampa Galván, Las Cuchillas, Pampa Smith, Las Víboras, La Tota, Pampa Dorotier, Las Leonas, Palmar 12 de Octubre Department; Las Breñas, Las Piedritas, Pampa Gómez, Pampa El Zorro, El Estero, Lote Morassi, 9 de Julio, India Muerta, Cuero Quemado, 9 de Julio Department; Hermoso Campo, Colonias Jacarandá I and II, and Tanigo I and II, 2 de Abril Department; Corzuela, General Belgrano Department. In Santiago del Estero, cisterns will be built in Pinto, Aguirre Department; Sachayoj, El Desvío, Colonia 433, Alberdi Department; Bandera, Belgrano Department; Avellaneda and Ibarra Departments; Pampa de los Guanacos, Copo Department; Quimilí, Moreno Department; Campo Toledo, Taboada Department.

The development of infrastructure to harvest and supply water stored in cisterns will contribute to a greater extent to meet the need of water for human consumption. In many cases, it will be the only measure available for rural families to adapt to climate change in territories where underground water is limited or affected by the poor physical and chemical quality of the water found in the subsoil, and will have a direct impact by lessening the work of the women and children in charge of supplying water for productive and reproductive use among the farming families.

1.1.3. Development of water catchment and storage systems: building of community reservoirs for small and large livestock

The situation in certain territories requires the use of different alternatives for water supply.

When no sub-surface or underground sources are available with appropriate physical-chemical qualities for use, open-air reservoirs are an alternative to catch runoff water in the area following rainfall.

Rainwater can be harvested and routed from the producers' fields to a storage vessel (reservoir) where it can be kept for later use, thus making it readily available for critical times during the year.

For the construction of the reservoirs, a catchment area needs to be found with little or no pollution potential, with the necessary incline to allow water to be collected and routed by gravity. The soil should have a clay subsurface horizon providing an impervious soil layer that will later serve as the reservoir bed. The place should also be located equidistant from the places the water will be used so as to enable an efficient distribution.

Reservoirs are built with a tractor hydraulic backhoe that excavates the ground to the depth permitted by the soil profile (a minimum of 1.70 meters). The excavation is carefully made so as not to go through the impervious clay layer.

At the main water intake of each reservoir, a sediment chamber is built for the annual mud removal/cleaning, thus preventing dragging material from clogging the main reservoir, risking its storage capacity.

A security perimeter fence is also built to prevent animals from accessing. Once filled, the harvested and reserved water is raised to a tank for distribution and use, both productive and reproductive.

This climate change adaptive measure provides for the development of 139 community and family reservoirs to catch and store water. These constructions will be allocated for use by 739 families in Santa Fe and Chaco. In the Province of Chaco, there are 17 families of the indigenous community of Campo Medina, 22 families of the community of Cuarta Legua de Pampa del Indio, Libertador General San Martín Department, and 448 families that are members of 20 organizations of native small-scale producers and indigenous communities of the Quitilipi Department. Other reservoirs will be built in 9 de Julio Department (Paraje Las Piedritas, Pampa Gómez, Pampa El Zorro, El Estero); in Machagai, in 25 de Mayo Department; in Presidencia de La Plaza, in Presidencia de La Plaza Department; in Garcitas, Capitán Solari and Colonia Elisa, Sargento Cabral Department; in the town of Gancedo, Colonias Las Cuchillas, Las Víboras and La Tota, all of them located in 12 de Octubre Department; Colonias Jacarandá I and II, and Tanigo I and II, 2 de Abril Department; in Paraje El Palmar, Bermejo Department.
In the Province of Santa Fe, reservoirs will be built in Garabato, Vera Department; Tostado, 9 de Julio Department; and Las Toscas, General Obligado Department.

All these actions are destined for highly vulnerable type A and type B population of the provinces of Chaco and Santa Fe. The constructions will improve water supply during water shortage for cattle and the irrigation of intensive productions. This will become a technological measure of great significance to be replicated and expanded throughout time.

1.1.4. Multipurpose water supply system for human consumption, animal watering and irrigation of orchards, fruit trees and pasture

When the underground water is conditioned by its chemical quality, like is the case in certain areas in the provinces of Santa Fe, Santiago del Estero and Chaco, the strategy is to use rainwater through a reservoir, supplementing and mixing the harvested water with underground water. Bearing in mind these characteristics, the percentage required to be mixed with rainwater is determined by its intended use: human consumption, animal watering or irrigation, as the suitability limits differ widely in each case.

The water is extracted from a well lined with casing, from a borehole or a system of holes called “spider legs”. Rainwater can be stored in a reservoir where its usable volume is directly proportional to the number of days without surface runoff in the catchment areas that cause the reservoir to become filled. This period may range from 5 to 8 months, depending on the location.

Tractors and shovels are used to build the reservoir and the earthwork that will support the storage tanks. The material excavated from the reservoir is laterally placed and well compacted with damp earth on the planned location for the implementation of a reservoir tank. The location of the tank will be indicated by the producers’ organization. The rest of the material will be deposited around the reservoir at no less than 15 meters, in places where it does not prevent the runoff from the catchment area.

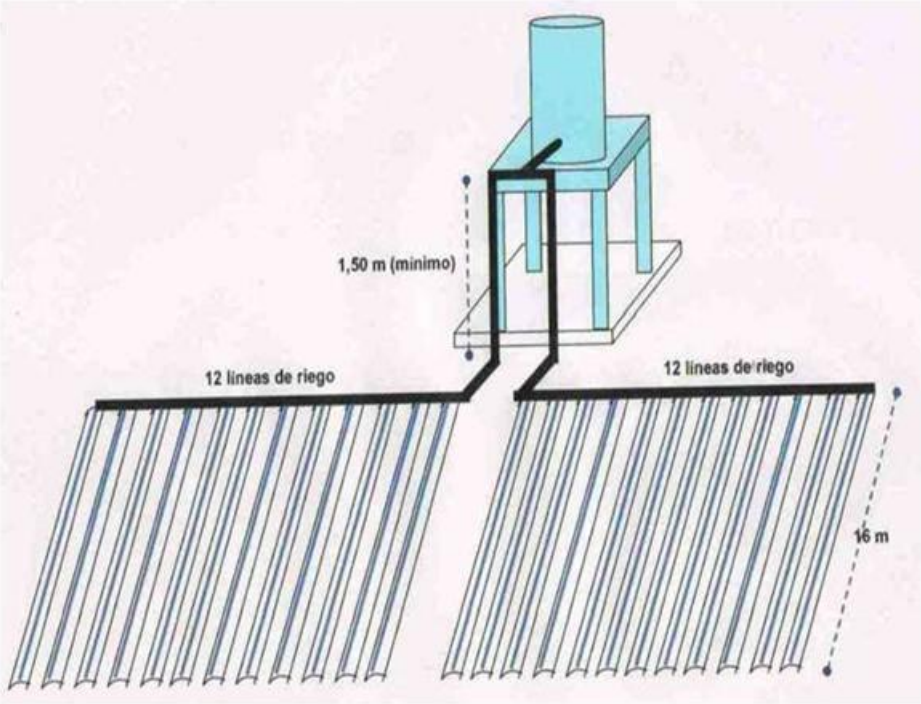
In order to fill the reservoir, anticipating losses due to evaporation and infiltration, a catchment area is systematized on the ground according to the volume that needs to be harvested during the rainy season using the surface runoff. High-performance windmills for minimal wind speeds are also used to supplement the system, to pump from the reservoir and from the wells lined with casing, or from the boreholes. To supplement the windmills in anticipation of days with no wind, storage tanks capable of meeting the community’s demand during 3 or more days need to be implemented.

In the case of water supply for human consumption, a sand filter with storage space is planned for construction. In this way, the water is rendered clean and ready for treatment with chlorine to make it suitable for human consumption. This type of filtering can also be used for the water to be allocated to the drip irrigation systems. Another use will be for animal watering.

Drip irrigation systems will also be added that allow optimizing and maximizing the use of this scarce resource for the production of vegetables, fruits and small parcels of high quality forage reserves.

The proposed system consists of hoses with drippers that work at a pressure of 0.15 kg/cm^2 achieved by means of a container or tank elevated 1.5 meters above the ground, as noted in the sketch below.

Sketch of the system implemented on the site



The multipurpose water supply systems will benefit 140 type A and type B families of small-scale agricultural producers in the provinces of Santiago del Estero and Santa Fe. They will be developed in Campo Toledo, Taboada Department; in Paraje San José and in the town of Pampa de los Guanacos, Copo Department, and in the town of Las Tinajas, Moreno Department; in the Province of Santa Fe, in Santa Lucía, Tartagal and Garabato, Vera Department.

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, 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, particularly for the impacts of droughts and floods, 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, favouring 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. This situation is even worse for women producers who are not deemed creditworthy by private banks or by public credit policies. Small-scale agricultural producers currently have no access to insurance (it being here understood as traditional products based on individual policies) and require special mechanisms for risk transfer such as social safety nets or emergency schemes with strong State intervention. Likewise, these special mechanisms must contemplate the inequality of access to the different risk management tools between men and women.

Making agricultural risk management strategies - which are accessible by capitalized companies and producers - available to men and women producers is part of a policy aimed at correcting inequalities, not only by raising awareness among the social agents but also by improving the rules of the game in which men and women producers are bound to participate.

The Government of the Province of Corrientes has just passed a Law that provides for an Agricultural Insurance Program for gradual implementation and voluntary adhesion. Pursuant to this Program, the Provincial Executive will be able to purchase insurance and related services, or finance and/or subsidize the producer to purchase such insurance. Although the law has already been passed by the Provincial Legislature, to date there is no news about the implementation program of such insurance, so it can be affirmed that there is no overlapping or duplication with the activities of subcomponent 1.2 of this project.

On the other hand, in the Province of Chaco, during the 2007-2008 and 2009-2010 campaigns, a multi-risk insurance program was implemented for cotton partially funded by the provincial government with funds under the Cotton Law (Law 26.060 passed in 2005, which creates a Plan for the Sustainable Development and Promotion of Cotton Production, Cotton Agricultural Insurance and Revenue Compensation Fund for Cotton Production).

Under this program, producers received credit to finance the expenses incurred in planting their crops through the execution of a raw cotton futures contract by a provincial financial institution that included a multi-risk coverage. The implemented scheme did not contemplate training the producers in the purchased coverage, policy terms, etc. A survey conducted by provincial technical experts verified that most beneficiaries were unaware of the terms of their insurance contract, of the covered risks and mechanisms to assess losses and, therefore, it was an instrument barely adopted by producers. At present, there are no insurance programs in force and no proposal has been developed by the insurance market.

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.

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 t 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.

The activities under output 1.2 are described below:

1.2.1 Feasibility study to develop a global multi-risk insurance Pilot Plan for small-scale producers of cereals, oilseed and cotton who have not had access to any subsidized insurance program in previous periods, with a partial subsidy of the premium

Small-scale producers in the region diversify their production as a risk management strategy; in this way, they grow more than one crop per year and diversify their agricultural production with livestock farming.

This study expects to collect information on production activities, coping strategies and risk management strategies broken down by sex to guarantee that the coverage design is equitable to both men and women producers.

This insurance might cover the most detrimental weather events like draughts and water surplus. The idea is to have the insured amount cover the total investment cost of the crops annually grown. Like this, the producer will at least recover the expenses invested in growing the crops and may restart the production cycle in the case of adverse events.

There are production and yield statistics for the main cereals and oilseeds broken down by department level so as to perform actuarial calculations of losses. Nonetheless, these yields represent the department average and they generally do not exactly match

the production levels of small-scale producers as the lesser use of technology (fertilizers, inadequate management practices, etc.) causes their crops to be more vulnerable to climate in general.

On the other hand, sufficiently comprehensive climate information needs to be available so as to assess the likelihood of extreme events like droughts, floods or frost that may affect production. Although the addition of new weather stations will someday allow moving forward in the insurance scheme to comprise a larger number of producers, their contribution in this stage is nil because no actuarial calculations can be made without any historical records available. Therefore, the feasibility study might indicate the convenience of implementing the Pilot Plans in regions near stations that do have historical records.

This study, performed with the insurers and the representatives of the producers, will help advance in the design of coverage that will involve the assessment of the technical premium as per the different alternatives as regards deductibles, expenses and operating requirements for implementation, premium co-financing schemes, policy design, etc.

1.2.2 Feasibility study to develop a risk management Pilot Plant for small-scale agricultural producers whose main activity is the field-base horticulture.

The main production activity of small-scale horticultural producers is the growing of watermelon, melon and squash. The best sales price is obtained in November, when this date is deemed an early date, due to which producers apply crop-growing techniques to bring forward the sowing and transplant date.

During the past years, these productions were highly affected by adverse weather conditions such as frost in July, August and September, and even in October. The occurrence of hail became relevant in August onwards and is more easily seen in the harvest season, causing leaves to fall and damaging stakes and fruits. Also, excessive rainfall accompanied by strong winds happen throughout the crop cycle causing defoliation and pollen washing in the flowering stage, and predisposing the plant to fungal and viral diseases.

Nevertheless, there are no horticultural production statistics, studies or essays to quantify the impact of these climatic factors on productivity. Therefore, under the activity 2.2.2, it was proposed to develop tests in demonstration plots to determine the water requirements of these crops and start assessing the risk they are actually exposed to.

Additionally, the proposed feasibility study will determine the most adequate coverage scheme to manage the climate risk to which small-scale agricultural producers are exposed, bearing in mind the limited information mentioned above.

The call to participate in the workshops must be made based on the identification of men and women producers to guarantee a participatory scheme. This not only means avoiding the use of sexist language but also contemplating flexible timetables and identifying places all men and women producers can access to participate.

1.2.3 Implementation and monitoring of the execution of pilot programs

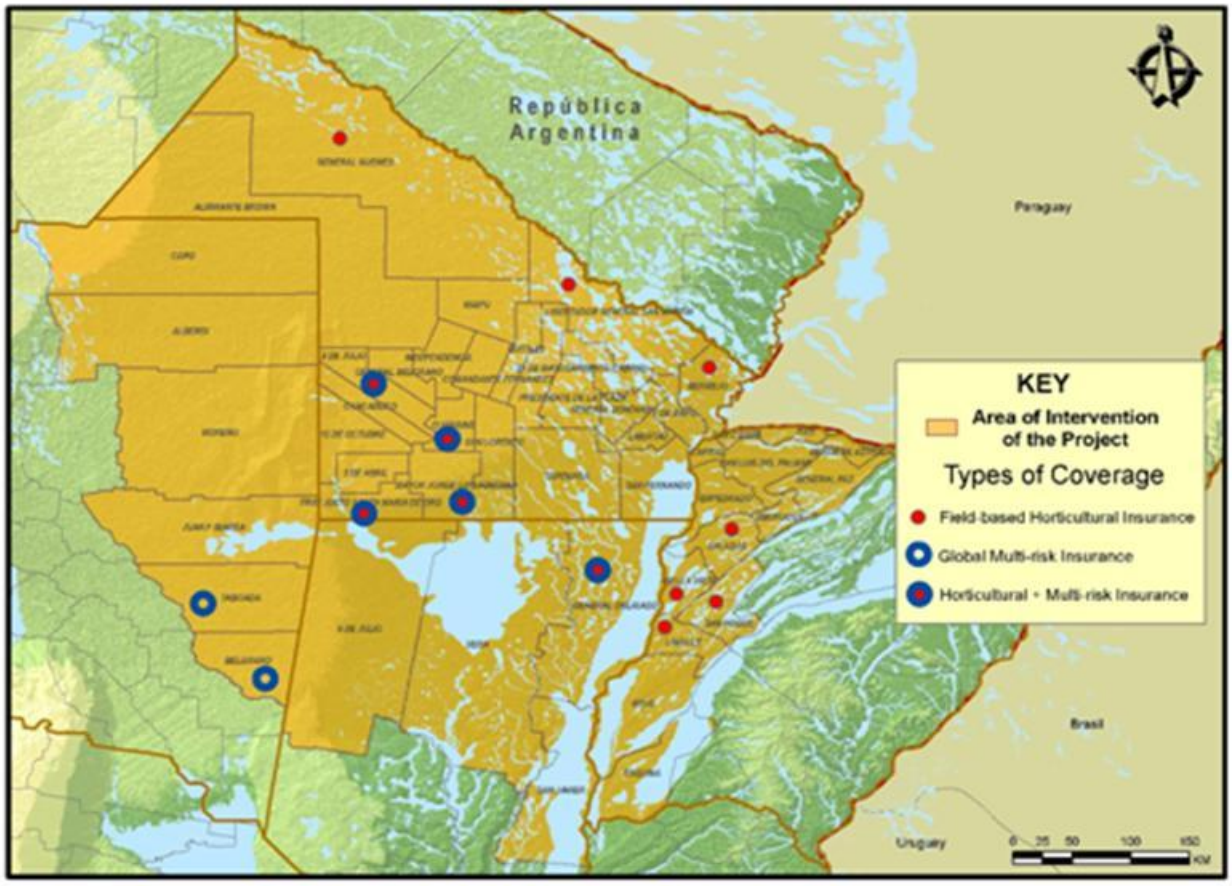
The Pilot Plans are expected to be implemented with the financial resources of the Adaptation Fund based on the outcome of the feasibility study. In this way, resources will be either used to partially fund the purchase of a collective insurance policy with one or several insurers, or to form a climate emergency Fund managed by the organizations themselves with the technical assistance of the Agricultural Risk Office.

Both the feasibility study and the design and implementation of the Pilot Plans will be performed by means of a participatory scheme with the rural communities, the technical experts of the institutions participating in the Project, and the representatives of local governments. The organization of Workshops and meetings will allow designing an implementation scheme that would meet the requirements of insurers while being economically viable in relation to the operating costs of damage assessment and loss control. Furthermore, follow-up Workshops of the implemented Plan must be organized with the beneficiaries in order to identify difficulties and propose any corrective actions as necessary.

The scope of the pilot plans was estimated pursuant to conservative assumptions about production costs and premium rates, setting a coverage floor that may be increased based on the outcome of the feasibility studies (premium level and deductibles, possibility of producers to co-pay the premium, etc.). In order to estimate the beneficiaries of each subcomponent, the records of the ReNAF[6] up to November 2011 were used. According to these records, no less than 47% of the owners of the Small-scale Agricultural Producer Groups (NAF[7]) of the NEA are women, and over 75% of them have no husband. Therefore, when selecting the beneficiaries, at least 47% of the NAF where the insurance will be implemented must be owned by women.

[6] RENAF: National Registry of Small-scale Agricultural Producers created in 2007 within the sphere of the Ministry of Agriculture, Farming and Fishing.

[7] Small-scale Agricultural Producer Groups: The person or group of people, whether or not relatives, who live under the same roof under a family setup, that is, they share food expenses and other basic expenses for living, whether or not they contribute labor force for the development of any activity in the rural environment.



Global Multi-risk Pilot Plan for cereal and oilseed producers in the region. Method to select the beneficiaries of Output 1.2.1

The following table shows the area covered by the selected crops - cotton, soybean, sunflower and corn - in 7 departments of the NEA where there is a high proportion of type A, B and C producers who are the small-scale producers that cannot have access to traditional agricultural insurance. The area to be insured (for the 4 crops) is 159,837 hectares. Pursuant to ReNAF's records, there are 1594 NAF in these departments; therefore, as it was resolved to insure at least 25,000 hectares, this means that at least **223 small-scale agricultural producer groups** will be covered.

OUTPUT 1.2.1			
PROVINCE	DEPARTAMENT	Cultivated ha 4 crops Types B, C and D	NAF
CHACO	9 DE JULIO	20,516.5	55.0
CHACO	FRAY JUSTO SANTA MARIA DE ORO	13,361.0	38.0
CHACO	MAYOR LUIS J. FONTANA	25,069.0	7.0
CHACO	O HIGGINS	29,671.0	228.2
SANTA FE	GENERAL OBLIGADO	63,709.3	689.0
SGO DEL ESTERO	BELGRANO	2,655.0	20.4
SGO DEL ESTERO	GENERAL TABOADA	4,855.5	557.0
TOTALS		159,837.3	**1,594.6**

Pilot plan for the insurance of Field-based horticultural producers. Method to select the beneficiaries of Output 1.2.2

For output 1.2.2, the number of hectares in the departments with a prevailing presence of small-scale field-based horticultural producers (mainly producers of squash, cassava, melon and watermelon) is 6,323 ha. As the estimated coverage floor is 1000 ha of horticultural crop, this means no **less than 564 families**.

OUTPUT 1.2.2			
PROVINCE	**DEPARTAMENT**	Horticulture ha (Cucurbits)	NAF
CHACO	9 DE JULIO	17.7	55.0
CHACO	BERMEJO	660.9	43.0
CHACO	F. J. S. MARIA DE ORO	0.9	38.0
CHACO	LIB.GRAL SAN MARTIN	1,026.5	361.0
CHACO	GENERAL GUEMES	2,079.8	1,094.0
CHACO	MAYOR LUIS J. FONTANA	30.9	7.0
CHACO	O HIGGINS	17.6	2.2
CORRIENTES	BELLA VISTA	914.4	199.0
CORRIENTES	LAVALLE	203.0	418.0
CORRIENTES	SALADAS	462.5	414.0
CORRIENTES	SAN ROQUE	800.8	251.0
SANTA FE	GENERAL OBLIGADO	108.9	689.0
TOTALS		**6,323.9**	**3,571.2**

1.2.4 Evaluation of the Pilot Plant, lessons learned and drafting of proposals and recommendations for the local governments.

As explained in the initial section, except for the cotton multi-risk insurance experience implemented in the Province of Chaco, risk transfer schemes for small-scale agricultural producers are currently quite scarce and have not had a successful outcome when promoting insurance as a risk management instrument.

However, in the countries of Latin America and the Caribbean (LAC)[8], the public sector is widely known to play an active role in supporting agricultural insurance in the region.

The public sector plays a significant role in the purchase of agricultural insurance to transfer agricultural disaster risks of subsistence producers, semi-commercial producers and agricultural producers that direct their production to the foreign markets. Several state governments in the LAC purchase disaster coverage at a macro level for the purpose of using the insurance payments to help small-scale agricultural producers and marginal producers affected by disaster events.

Some countries in the region have developed programs addressed to the small-scale agricultural and marginal producers. In Argentina, the hail insurance program carried out in the Province of Mendoza and the program for cotton producers implemented in the Province of Chaco were developed by the provincial governments with the help of the Federal Government.

The implementation of the Pilot Plant funded by the Adaptation Fund will allow identifying the achievements and difficulties encountered by these risk transfer schemes as an adaptive mechanism to climate change and its variability for the rural population in the NEA region. Also, the support of the producers during the formulation and implementation stages will enable the gradual learning of the scope of these instruments and a change as regards their role in risk management.

The evaluation of the results of the Pilot Plans will allow fine-tuning the implementation of the risk transfer mechanisms proposed as pilot plans to achieve their sustainability. These adjustments may consist in suggestions to the local governments to include insurance instruments in their policy-making process, as well as recommendations to the representatives of organizations based on the lessons learned and the manner to overcome any identified limitations, in order to increase resilience of small-scale rural producers.

The implementation of multi-year insurance and insurance funds with the participation of insurers and provincial organizations involved both in the execution and the supervision to ensure continuity, is the first step to maintain a conduct that will incorporate risk

[8] Agricultural Insurance in Latin America. World Bank. December 2010

management practices among the most vulnerable small-scale producers in the medium term.

Output 1.3 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 bring about more frequent water deficits. This increase in rainfall favours 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, and forest grazing or agro-forestry 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.

1.3.1 Assistance to indigenous populations in building fruit and vegetable gardens with irrigation and in raising small animals

The impact of adverse weather on indigenous populations characterized by a low economic level (survival) is disturbing. The production activities (vegetables, fruits and small animals) associated with the rural family household are a strong support from the

economic, nutritional and optimization of available resources point of view. It is also a practice that enables the sustainable management of resources. It can be carried out in reduced spaces and usually concerns the whole family, although women are typically the ones most involved in the activity.

The proposal consists in providing technical assistance in the management of a diversified production that includes forage, fruit and vegetable species with localized irrigation, combined with the raising of small animals (hens, rabbits, etc.). It seeks to improve the availability of staple food for the sustenance of the family group and enable the generation of marketable surpluses, obtaining in the same place healthy, fresh products without agrochemicals and contributing to environmental protection.

In this component, the work will be mainly performed with indigenous populations. It will involve 82 type A-families of the Province of Chaco, the Community of Laguna Lobo and Campo Medina, Pampa del Indio, General San Martín Department.

1.3.2 Management and use of forage resources.

Livestock is the main resource in the livelihood strategies of small-scale agricultural producers. To these producers, it is the main source of proteins and a capital reserve.

Due to the above, forage stock becomes a key resource in most of the area where the project will be implemented, in which forage production is of a seasonal nature (spring-summer-fall) and growth is scarce or nil during winter. Forage production suffers variations throughout the year that increasingly depend on changes in weather conditions, in addition to plagues and diseases.

There are several technological options that enable climate change adaptive actions with an emphasis on the management and use of forage resources based on the specific conditions of each territory. This project will promote the following actions:

a- The implementation of forest grazing systems as a production alternative comprising forestry and livestock farming. These systems enable the achievement of greater production in biological and economic terms in a sustainable and profitable way. The climate and soil limitations typical of the area for project execution call for the incorporation of adapted species so as to achieve forage productions that are stable over time. In this sense, mega thermal species are spring-summer species characterized by quick growth and high water use efficiency, favouring moisture retention in the profile. Forest grazing systems will be implemented with the incorporation of mega thermal pastures adaptable to the area and resistant to temperature changes and long droughts, destined for both small and large ruminants (goats and cattle, among others). A mixed system of pastures (drought-flood) will also be planted.

b- The use of a combined association of grass and legume to yield profits on animal produce. The physical aspects of the soil (apparent density, infiltration) are improved while fertility is increased, enabling soil fauna diversity.

c- The use of multi-purpose species like the tuna (*Opuntia ficus)*. In environments where water shortage prevails and forage production in winter is affected, small-scale livestock producers use local species like the tuna. The fleshy leaf of this cactus is a forage supplement highly efficient in water use as goats that are supplemented with tuna consume less water. As it is a multi-purpose species, in addition to its use as forage, it can also be used as a fresh and processed fruit.

d- Finally, one of the alternatives to increase forage availability throughout the year is to change the pasture management, keeping any surplus for use in critical periods. Forage reserves will be generated to be used for regional livestock production. One of the strategies to be developed is aimed at the generation of forage reserves as a climate change adaptive measure in small livestock production systems. For that reason, the proposal seeks to promote the use of quality forage conservation technologies that make up for forage deficit due to the climate that affects both cultivated pastures and natural grasslands. By means of suitable technologies for small-scale agricultural producers, the production of straw bales, rolls and microsilage will be promoted, thus contributing to a sustainable production and the improvement of the household economy.

The implementation of agro-forestry systems involves 254 families in the provinces of Santiago del Estero, Chaco and Santa Fe, mainly of type A and type B. In Santiago del Estero, in Monte Quemado, Copo Department; El Desvío, Taboada Department; Sachayoj, Alberdi Department. In Chaco, Santa Rita and Santos Lugares, General San Martín Department; in La Unión, Paraje La Esperanza and J.J. Castelli, General Güemes Department; El Palmar, Bermejo Department; Parajes Las Leonas, Colonia Ugarte, Pampa Dorotier and Paraje Pampa Landriel, 12 de Octubre Department, and in Libertad, General Donovan and San Fernando Departments. In Santa Fe, Las Toscas, Obligado Department; Tostado, 9 de Julio Department; Garabato, Vera Department; in La Brava, San Javier Department.

The activities planned with the combined association of species will be developed with 34 type A and type B families in the province of Chaco. The selected departments are Las Piedras, El Palmar and the peri-urban area of General Pinedo, 12 de Octubre Department; Hermoso Campo, 2 de Abril Department; Las Breñas and 9 de Julio Department.

Activities will be implemented for growing tuna destined for 10 families in Santiago del Estero, Sachayoj, Alberdi Department. In Chaco, it involves 28 families in 12 de Octubre Department and 3 families in 2 de Abril Department.

The start-up of the forage reserve activity as a climate change adaptive measure in small livestock production systems will involve 144 families and will be developed in the provinces of Corrientes, Chaco and Santa Fe with type A and type B families. In Corrientes, Goya, San Cosme and San Luis Departments. In Chaco, in Colonia Elisa, Colonias Unidas, Capitán Solari, Sargento Cabral Department; Tapenaga and Santa María de Oro Departments; Hermoso Campo, 2 de Abril Department; General Pinedo, 12 de Octubre Department. In Santa Fe, Villa Ana, Villa Guillermina and Villa Ocampo, General Obligado Department.

1.3.3 Implementation of soil management techniques by means of contour ploughing and/or the incorporation and management of cover crops and green manure

A sustainable production is only plausible provided measures are adopted to recover degraded soils and feasible technological options are developed and implemented for climate change mitigation and adaptation.

Taking into consideration the water erosion risks upon the occurrence of heavy rain that in some cases causes the decapitation of the surface horizon and the exposure of low permeability layers and less content of organic matter, it is of the utmost important to make emphasis on sustainable soil management. In order to control water erosion at farm level, technologies need to be applied that regulate the speed of surface runoff and enable storing water deep underground. An alternative is to avoid intense topsoil disturbance by preparing the ground and planting on contour lines.

Soil management techniques will be implemented to avoid erosion and flooding of fields destined for household production. To this end, contour lines will be ploughed to avoid surface runoff and the associated soil loss. This activity will contribute to diminish the erosion process of the soil allocated to household production caused by water surplus, improving water catchment and availability in the soil profile.

Likewise, cover-cropped soils better preserve the stored and available water than naked soils, while being protected from the direct effect of the rain, wind and sun, thus reducing the risk of erosion. With the purpose of improving water availability and soil fertility, cover crops and green manure will be jointly implemented with the small-scale agricultural producers so as to increase the existing moisture by incorporating more organic matter into the soil.

Contour lines will be systematized with 17 families. In the Province of Chaco, in Las Leonas, 12 de Octubre Department; and in Santiago del Estero, La Esperanza, Sachayoj, Alberdi Department, mainly with type A and, to a lesser extent, type B producers.

The cover-crop planting activities and green manure management will involve 102 type A and type B families. They will be developed in Corrientes, in the following Departments: San Cosme, San Luis del Palmar, Goya, Lavalle, San Roque and Itatí. In

Chaco, in Paraje El Jacarandá, Hermoso Campo, 2 de Abril Department; and General Pinedo, 12 de Octubre Department.

1.3.4 Adaptation to extreme temperatures by means of crop protection structures

The Climate Change adaptation process entails, among other things, strengthening producer's technological capacity. In the opinion of the producers, the occurrence of increasingly frequent extreme temperatures is another variable that more clearly evidences the existence of a Climate Change under way in the territories they inhabit.

Among other phenomena, the duration of the frost-free season is being affected. The occurrence of late or early frost forces producers to resort to the use of different systems to protect their crops. Therefore, in horticulture, it is of the utmost importance to introduce technological measures for crop protection.

As an adaptive measure, macrotunnels will be used to protect the different horticulture and floriculture crops. The use of greenhouses will also be adopted to protect against late and early frost and unfavourable temperature changes.

In contrast, summer periods with temperatures soaring to 50ºC at ground level are more and more frequent, and this situation makes it impossible to grow vegetables that would ensure the food safety of the small-scale producers in these territories. As an adaptive measure, shade-cloth structures will be built for growing vegetables, coupled with drip irrigation systems, as a means to protect them against extreme heat.

Crop protection activities in low temperatures will involve 48 type A, B and C families of the provinces of Chaco and Santa Fe. In the Province of Chaco, in Gancedo, 12 de Octubre Department. In Santa Fe, Las Toscas, Villa Ocampo, Los Laureles, Colonia Durán, General Obligado Department; Tostado, 9 de Julio Department; Garabato, Vera Department; Romang, San Javier Department.

The implementation of shade-cloth and optimized irrigation technologies will involve 224 type A and type B families of the provinces of Chaco and Santiago del Estero. In Chaco, in Libertad, General Donovan and San Fernando Departments; El Palmar, Bermejo Department; Las Piedras, El Palmar, Limitas, Pampa Galván, Pampa El Cielo, Paraje La Picada, Barrio Mailín (General Pinedo), Pampa Smith and Gancedo, 12 de Octubre Department; Comandante Fernández Department; Hermoso Campo, 2 de Abril Department; Charata, Chacabuco Department; Las Breñas, 9 de Julio Department. In Santiago del Estero, Pampa de los Guanacos, Copo Department; San Fernando and Sachayoj, Alberdi Department.

1.3.5 Addition of equipment and improvement of facilities

Adverse weather conditions cannot be modified in extensive production but there are management practices that can be resorted to mitigate their impact. By adding

production infrastructure for small livestock that is adaptable to the area, such as pens, fences, roofs, drinking and feeding troughs, it is possible to improve the overall management of the stock that directly impacts on the health and welfare of the animal and prevents animal death. Through this activity, small-scale producers are expected to improve production conditions.

This activity will involve 109 type A and type B families of the Province of Chaco, in Mayor L. Fontana and Fray Justo Santa María de Oro Departments; Las Breñas, 9 de Julio Department; Charata, Chacabuco Department.

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

The main measurement networks of climate variables at a national level are the National Meteorological Service (SMN) and the National Institute of Agricultural Technology (INTA). Also, in the NEA region, there are several sources of measurement of climate variables, such as rain gauges from different provincial institutions. However, the density of weather stations is very low in relation to the surface of the territory, the high climate variability observed and the expected climate change scenarios.

A synoptic station can provide relevant information at a local level but it is essential to have a network of automatic stations that provide data with a higher frequency and transmit it in real time. The World Meteorological Organization currently governs the standardization of international observations, establishing the procedures and practices that must be applied. The history of weather observation in Argentina has experienced the ups and downs and discontinuity of its national history. The largest amount of information in data sets with decades of historical records available to the general public is gathered in the National Meteorological Service and in the National Institute of Agricultural Technology.

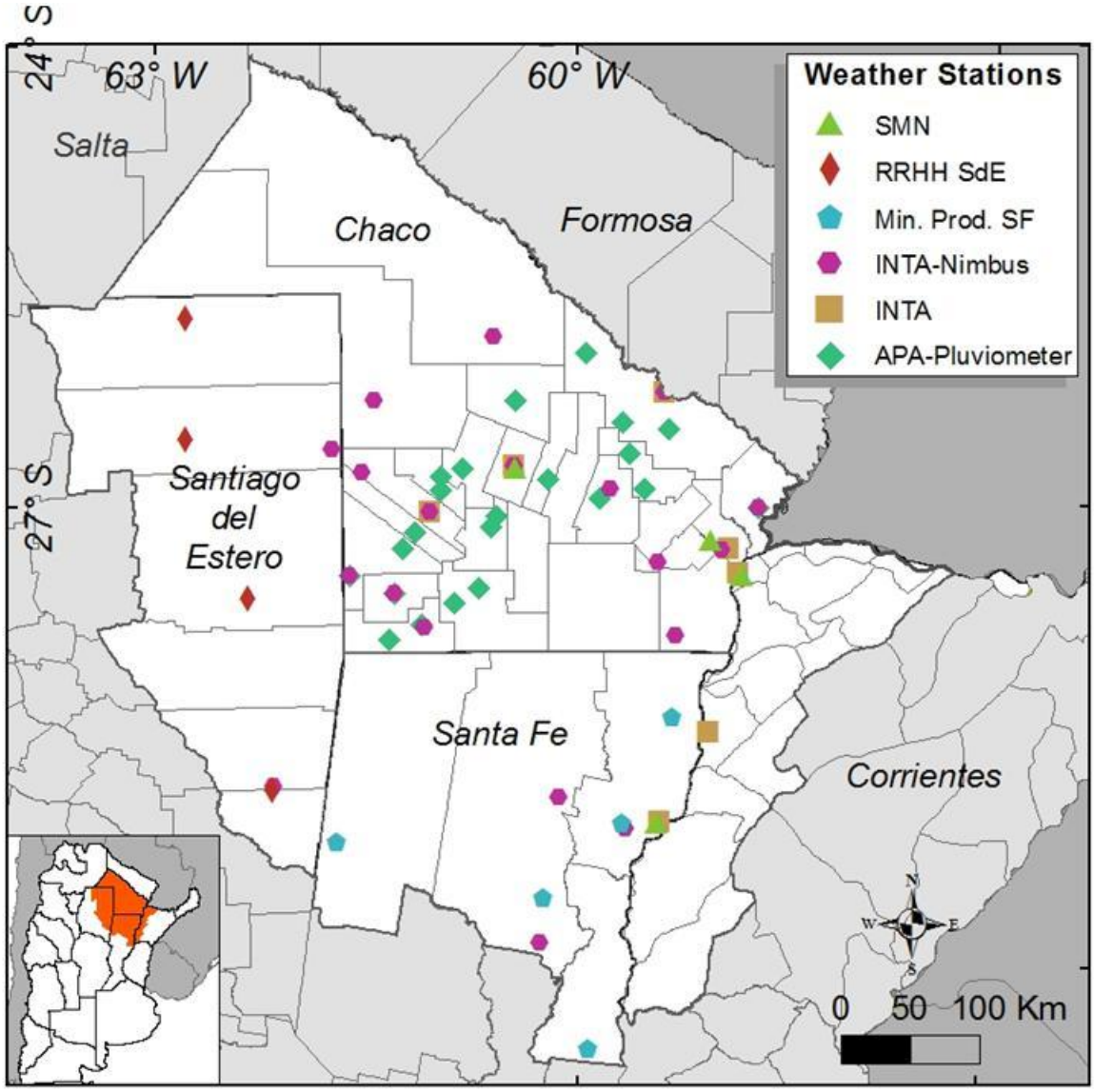
In addition to synoptic networks, several networks of automatic stations provide surface meteorological data. These stations can capture, record or transmit data in fractions of less than an hour, generally in 10-minute fractions, transmitting the information to several meteorological data managers hosted in servers.

The following map shows the location of SMN's synoptic weather stations, the INTA's agrometeorological stations, and the rainfall stations of the Under-secretariat of Water Resources.

SMN's weather stations comply with the standards of the World Meteorological Organization for surface synoptic stations. INTA's stations also measure supplementary physical and biological elements that are useful to determine the relationship between the time and the life of plants and animals. Rainfall stations only report on accumulated daily precipitation.

These national institutional networks are supplemented by the networks from the different provincial departments and agencies.

For instance, in the Province of Chaco, the Provincial Water Administration (APA) has a network formed by 65 conventional rain gauges that take two measurements a day, at 7 a.m. local time and at 5 p.m. local time. The daily data reported by this network does not match the WMO's pluviometric day as the latter is from 7 a.m. to 7 a.m. Measurements are taken by police officers and reported back by e-mail. Pluviometric series have a variable record, an average of 20 years, with certain locations having records over 30 years.



Existing weather stations in the project area

The INTA, through the Climate and Water Institute, has jointly developed with the National Technological University (UTN) an automatic agrometeorological station designed to strengthen the capture need of institutional networks. One hundred and fifty stations called *Nimbus* are being developed that would allow increasing the number of observation and data collection points of INTA's entire backbone. The Nimbus station complies with the institutional requirements regarding durability and open and non-proprietary systems to ensure the sustainability of the collection networks.

Automatic Agrometeorological Station Nimbus THP (INTA-UTN)

The minimum density of rain gauging stations recommended by the WMO is 575 square kilometres for each rain gauge in the case of inland plains (WMO, "Guide to Hydrological Practices, Data Collection and Processing, Analysis, Forecasting and Other Applications, WMO – No. 168.1994). The following table shows that this density is not reached practically in any of the areas of the provinces involved in the project with a very uneven distribution. In certain provinces, if rain gauges are considered, the density is close to the recommended value, but the map shows how the distribution of rain gauges is concentrated in the northeast.

	SMN's and INTA's Synoptic Stations	Automatic Stations	Rain Gauges	Area (sq km)	Density (sq km) "1 station every"
Chaco	3	11	22	99781	7127 / 2772**
Santa Fe (north)	2	6	-	55925	6991
Corrientes (west)	3	-*	-	27264	9088
Santiago del Estero	-	6	-	62360	10393

*Network planned by the Province of Corrientes: 12 in the area of influence.

** Density taking into account the stations and the rain gauge network.

The foregoing table shows the low density of data collection sites for each of the provincial territories involved in the station project as compared with the benchmark values shown on several reference publications. As this is an area with high variability in the space-time distribution of rainfall and other agrometeorological and hydrological variables, a more dense and consistent network is needed to appropriately design adaptation strategies.

Another major problem of the monitoring, follow-up and climate alert systems is the lack of integration between all the networks of the different sources. Also, there is a great variety of quality and calibration standards in the measurements taken, lack of unified information in a consolidated database, and lack of adoption of hydro-meteorological data quality standards like the ones proposed by the WMO.

This diversity of criteria, formats and quality standards in place in the different networks shows the need to develop a project to integrate the different networks and achieve data interoperability.

Data availability and public access to it is deficient and threatens an efficient decision-making process, the synopsis of the current situation, its incorporation into the numerical weather prediction models and the monitoring and analysis of trends, climate change and its variability.

Taking into account the above-mentioned limitations, this project component proposes to increase the number of networks for the collection of meteorological data and the number of complete stations for the measurement of thermal, hydrological and pluviometric variables (more than 10 variables) so as to be able to increase the monitoring of climate variables with a data collection system in line with the standards approved by SMN and pursuant to WMO's regulations that would allow monitoring other variables and integrating the information into a consolidated and publicly available database.

This project component proposes the densification of the collection network, the measurement of a greater number of variables in certain stations, the strengthening and integration of the collection networks of the different organizations, and the availability of

consultation and access systems of data pertaining to the region covered by the adaptation project.

Plans have been developed for the construction of 15 Nimbus stations and 3 mobile Nimbus stations for testing under components 1.2 and 2.2. Furthermore, in view of the need of certain calculations to have data on evapotranspiration, winds and soil moisture, it is proposed to convert 10 Nimbus and commercial stations of the provincial networks into complete networks (wherever this change is feasible).

This output also proposes the integration of several networks. This involves several institutional arrangements to integrate data in a feature-rich web-based agrometeorological data manager that would enable public consultation and would facilitate the decision-making process of the players and beneficiaries of the adaptation project.

The data collected by the new stations and the network integration are expected to feed the processes of other components like the Early Warning System and the development of regional climate models and vulnerability and climate risk maps in the different territories.

This integrated climate data and information system will provide the foundation for the different climate impact analyses and information on geographic vulnerability to climate-related risks, social vulnerability and emergency situations that may arise as a consequence of climate change and its variability.

Description of activities and implementation schedule are described in sections below.

2.1.1 Development, assembly, installation, adjustment and monitoring of 15 automatic meteorological stations

Meteorological stations of the “INTA&UTN institutional model” will be developed, assembled, adjusted and monitored for the densification of the data collection network in areas with deficiency. 3 mobile Nimbus stations for experimental testing under components 1 and 2.2 will be assembled as well. The following activities are planned for the first year: the design, purchase of instruments and parts, commencement of the assembly of 18 simple stations (15 fixed and 3 mobile) that would measure 5 meteorological variables; inspection and inventory of the condition of existing stations and collection networks. The second year will deal with their installation in the different priority areas of the territory, training to the local heads, technical adjustments and upgrading of stations. During the third year of the project, maintenance and monitoring, as well as network operation adjustment and control tasks will be performed.

2.1.2 Conversion of 10 simple automatic stations into complete measuring stations

Conversion of 10 simple automatic stations (rain gauging stations or Nimbus stations measuring up to 5 variables) into complete measuring stations. The first year contemplates a feasibility study for the upgrading of stations in the different networks so that they can measure all the meteorological variables, as well as the design and purchase of the required instruments and parts. Thus, 10 measurement and collection sites will start measuring more than 10 meteorological and environmental variables. Also, the first year contemplates an inspection of the condition, as well as the renewal and strengthening of instruments in INTA's and SMN's conventional weather stations (not automatic) by providing the required measurement instruments. For the second year, the on-site upgrading of stations is scheduled, planning the conversion of 5 stations of INTA's network and 5 stations of the provincial networks. The third year is reserved for maintenance, monitoring and control tasks and adjustments.

2.1.3 Network integration

Network integration following a thorough inspection and inventory of existing automatic stations and collection stations (stations or rain gauges). An information system feasibility study and institutional agreements and arrangements with the institutions and players responsible for those networks and stations are required. The second year contemplates the purchase of information equipment (servers) and accessories, as well as their installation in each institution responsible for the equipment, and computer-related tasks to enable network integration and communication among servers and databases. The third year is reserved for maintenance, monitoring and control tasks and adjustments.

2.1.4 Strengthening of Information Systems of local nodes

During the first year, a study will be conducted on the information system feasibility of strengthening data integration nodes and server systems, inspecting and taking inventory of current equipment and needs. The second year contemplates the purchase of the IT equipment, servers and accessories required for integration among the different institutes. The installation in each institution responsible for the equipment will also take place during the second year, as well as any computer-related task to enable network integration and communication among servers and databases. The third year is reserved for maintenance, monitoring and control tasks and adjustments.

2.1.5 Interoperability, data standards and quality, unification of databases, consultation mechanism and web Interfaces

Interoperability, data standards and quality, unification of agrometeorological and hydrometeorological databases of local and national institutions; consultation mechanism; web Interfaces. The first year will deal with format adjustment, the definition of international standards for the data, the application of formats, and interoperability of

meteorological data. The design of meteorological databases is also part of the joint activities and workshops among the participating entities during the first year. The second year will deal with the purchase of additional desktop equipment/servers to enable the activities of the subcomponent on the premises of the government entities of the area under study. Definition of data communication protocols. System design. Final stage of the development of applications for databases and servers. Web applications and services. The third-year activities are intensive with several workshops organized among the participating entities, including the adoption of an interoperable data format as per the WMO. Quality protocol and standards adoption. Creation of an online consultative forum.

The following table describes the results expected from the above-mentioned activities for this project component:

Activities	Expected Result
2.1.1 Development, assembly, adjustment and monitoring of 15 automatic weather stations of the “INTA&UTN institutional model” for the densification of the data collection network and 3 mobile Nimbus stations.	A regional agrometeorological network with a higher density of climate and environmental data collection stations for monitoring climate variability and climate change, and the outcome of components 1 and 2.2.
2.1.2 Conversion of 10 simple automatic measuring stations into complete measuring stations.	Prioritization of data collection stations and provision of a larger amount of climate information.
2.1.3 Network integration.	Different entities prioritizing their collection networks, preserving their institutional identity, and sharing data through distributed and integrated networks.
2.1.4 Strengthening of Information Systems of local nodes (servers, etc.).	Improved systems for the centralization and distribution of regional and national meteorological data.
2.1.5 Interoperability, data standards and quality, unification of agrometeorological and hydrometeorological databases of local and national institutions; consultation mechanism; Web Interfaces.	Local decision-makers and players equipped with an integrated climate data system with high-quality data accessible from standardized databases, with qualitative and quantitative improvements in the available data and generated information, feeding models and tools for decision-making through data interoperability.
Overall result of the execution of the entire component 2.1.	Extrapolative model for the densification and integration of regional collection networks with a change of culture as regards integration, collection, accessibility and availability of agro-

	hydro meteorological data for monitoring, risk management and early warning systems, in the face of extreme weather events.

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 that will allow disseminating 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.

Below is a detailed description of the activities to be developed under this subcomponent.

2.2.1 Compilation, integration and analysis of databases and georeferenced mapping

Compilation, integration and analysis of databases and georeferenced mapping in the area of intervention in relation to hydrological, topographical, soil, hydrometeorological, meteorological and geomorphologic characteristics. Information must also be compiled on crop phenology, sow and harvest dates, and types of cultivation practices. Incorporation of related databases with cartographic information not available in this format (e.g., soil charts and datasheets on paper) in a format compatible with a geographic information system. This information is required to provide the basis for modelling the water balance and early warning systems.

2.2.2 Tests on demonstration plots

Tests will be performed on demonstration plots to assess the water requirements of cotton cultivation in narrow furrows, of field-base horticultural crops and in natural subtropical pastures and grasslands, by the use of soil moisture sensors and/or the automatic mobile meteorological stations acquired in Output 2.1. This will allow

assessing the water consumption of these crops or pastures and later determine, based on the water balance developed by the Agricultural Risk Office, the monitoring of stress or water surplus situations, and the drawing of risk maps.

2.2.3 Risk maps

Drawing of risk maps in relation to drought, water deficit and water surplus for planted and natural pastures in the area of application, pursuant to the soil information collected and their water consumption calculated based on the tests performed. These maps will be used by insurers in planning where to establish higher risk areas to avoid risk accumulation, or to establish areas not suitable for cultivation.

Early Warning System

The following activities will form part of the Early Warning System for extreme weather events affecting the production activities of the NEA Region:

2.2.4 Soil moisture monitoring system

Develop a soil moisture monitoring system based on the operational execution of the water balance algorithm developed by the Agricultural Risk Office, simulating the availability of useful water for subtropical grassland in the area of application. For areas with rain-fed crops, the incorporation of monitoring of water conditions for cereal, oilseed and field-based horticulture. The systematic construction of probable scenarios of water availability for pastures for the future (30 and 60 days) will be performed in order to establish early warning alerts on potential water deficit or surplus.

2.2.5 Analysis of Climate Change scenarios and climate trends and their impact on crops

An evaluation will be made of short, medium and long-term climate change scenarios and of change trends observed from the use of historical records of synoptic stations, so as to establish mean and extreme values and trends.

2.2.6 Hydrological warning component integrated into the EWS

The overflow of rivers is one of the main causes of the risks associated with floods and flooding events. From a regional point of view, an important area of intervention within the project is located in the geological river bed and floodplain of the Paraná River. It also gains significance in several areas of intervention under the project for water impoundment and its use in irrigation or multi-purpose applications.

One of the activities relating to this project subcomponent is the definition of the seasonal flows of plain rivers and of the streams or tributaries of the Paraná River by means of hydrological forecasting models, and the determination of potential flooding

areas and vulnerability based on river levels and historical satellite images for the last 30 years.

Also, the information generated by national organizations (INA) on the hydrometric level of the Paraná River, and by provincial River-basin Committees on the Paraná tributaries, as well as the relationship it bears to the vulnerability of the different areas adjacent to its riverbed, and its influence in water level, need to be integrated, converted into appropriate formats and transferred.

The resulting water sensitivity map integrated into SIG, coupled with the seasonal forecast results on the flow of rivers, will allow producers to directly know to what extent their fields could be affected by water, based on the hydrological scenario chosen pursuant to the seasonal forecast.

2.2.7 Weather alert component, integrated into the EWS

Generation of a protocol and methods to analyze and transfer information from seasonal weather forecasts of international and national reference institutions to the players of the area of intervention.

Seasonal forecasts are probabilistic in nature and indicate the likelihood of total rainfall during a period of time being normal or above or below normal. This means that they provide an overall view of the region. These forecasts are quite useful as they allow producers to prepare themselves much sooner when combined with a follow-up of weather forecasts on a shorter scale.

The planned activities include the analysis of the information generated by international and national organizations, its adaptation to the project area, the follow-up of seasonal weather indicators, and the transfer of information to make it available to the decision-makers in the regions.

In view of ENSO's high impact and significant signal in this area, the reading, adaptation and transfer of this climate information is extremely significant for the decision-making process as regards sow dates, variety and cycle, or cultivation to be chosen in each campaign, and also to predict seasonal risks and vulnerabilities in each territory. Therefore, an analysis will be made of the impact of the ENSO phenomenon, on an agro-climatic scale, on the meteorological variables that determine agriculture production.

Furthermore, a crop yield modelling will be performed in the different areas based on meteorological variables and management options. This will allow calculating the climate risk associated with a specific decision based on a seasonal forecast of rainfall and temperatures.

2.2.8 Integrated Web Platform

Development of an integrated web platform that enables access to the early warning system developed, in connection with the socio-territorial vulnerability and each production chain. Also, the EWS information obtained through the risk studies and modelling will be integrated into a Geographical Information System that will enable the design and adoption of measures aimed at reducing the vulnerability of small-scale agricultural producers to climate change and its variability, and adopt measures in the event of climate emergencies.

Local capacities will be strengthened through the supply of equipment and Internet connection to local communities and government entities in order to enable access to the EWS. Furthermore, training workshops will be organized in the use of the EWS to explain the scope and limitations of this tool and its potential application in the decision-making process to prevent and/or mitigate the consequences of adverse climate events.

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.

To increase the adaptive capacity and resilience of small-scale agricultural producers to climate variability, education and training both at the different government levels (professionals and technical experts at a national, provincial and local level) as well as at the producers level, is essential to energize the participatory processes of a successful adoption of new technologies, practices and methods to manage natural and production resources. This is why component 3 focuses on building local and regional capacities and on spreading the knowledge of climate change and its variability to a wide range of direct and indirect players and, in particular, on the progress made, lessons learned and the best practices derived from project implementation (components 1 and 2).

Education and training in the hydrometeorological risk and in adaptive measures both at the different government levels (officials and technical experts) and of the direct project beneficiaries will encourage the inclusion of this issue in public policy development and in the decision-making process of the key players.

This component primarily consists of workshops, seminars and modules for action learning and of educational materials for dissemination and training in the subject and the adaptive measures implemented.

Expected results:

- Officials from all levels (national, provincial and local) make better decisions based on the resilience to Climate Change effects and incorporate adaptive measures into public policy making.
- Government technical experts from all levels (national, provincial and local) efficiently and effectively advice and support small-scale agricultural producers in their adaptation and resilience to Climate Change effects.

Component 3 is divided into the following 2 subcomponents

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

Output 3.1 is divided into 7 large topics:

3.1.1 Raising awareness and knowledge about the need to include the climate variability issue and its effects in daily activities

At present, the professionals working with Small-scale Agricultural Producers and indigenous peoples in rural development activities do not usually and knowingly have in mind the Climate Change implications on the production systems of the regions where they work. In general, they lack adequate responses in the face of phenomena caused by climate variability in that region.

Expected result: The technical experts of the institutions working with Small-scale Agricultural Producers in the region where the project is developed, and the representatives of provincial and local governments, are aware of the Climate Change issue and incorporate it into their daily activities.

Strategy to be developed: A course will be organized for a maximum of 20 multiplying agents from the different provinces where the project is being executed (government technical experts and representatives) on the integration of Climate Change adaptation into daily activities.

In a second stage, multiplying agents will offer courses to the technical experts involved in the project on the strategies to integrate Climate Change adaptation.

The main topics of the courses will be interpreting climate data; detecting vulnerabilities; identifying and choosing adaptive measures; monitoring measures to be implemented; and developing institutional capacity.

Also, educational materials like manuals, brochures and primers will be edited.

3.1.2 Introduction of a rights approach into public policies: gender perspective and work with indigenous peoples.

Expected result: Policy-makers, national officials, technical teams and extension agents incorporate the rights approach into public policies.

Strategy to be developed: Training workshops will be organized on the introduction of a rights approach into public policies: gender perspective and work with indigenous peoples.

There are also plans to hold a workshop for policy-makers and national officials of the participating institutions, and a workshop for technical teams and field extension agents during the first year of project execution. Likewise, the gender perspective will be interrelated with all the training workshops of the Project through the supervision and assistance of the UCAR's Gender Unit.

3.1.3 Introduction to risk management

Expected results: Small-scale agricultural producers convey their perception of the climate risk affecting them or their expectations as regards the scope of a risk transfer instrument.

Strategy to be developed: During the first year, the proposal is to hold a workshop, at least in four towns, for the analysis of the climate risks affecting specific productions of the region in each town so as to assess the risk perception by small-scale agricultural producers and their expectations as regards the potential scope of a risk transfer instrument.

These workshops must be organized pursuant to a schedule that enables the participation of producers and the incorporation of new topics and concepts. These capacities are proposed to be developed with a specialist in participatory training that would also collaborate in the drafting and format of the printed material to be used in the workshops. The workshops will be organized at times allowing the participation of women producers.

3.1.4 Use of climate information for risk management

Expected result: Officials and technical experts of the provincial governments and producers of the four provinces involved will improve their knowledge of risk management.

Strategy to be developed: A course will be organized on the following basic meteorological concepts: phenomena, their associated temporal and spatial scales; forewarning; difference between weather and climate; the notion of likelihood related to weather forecasts and climate trends; climate change concepts, climate variability and scenarios.

The course for officials and technical experts of the provincial governments will last 2 days. The same topics will be developed in workshops for producers of the four provinces involved in at least four towns.

3.1.5 Understanding the insurance or other instrument to be implemented

Expected result: Men and women producers, organization leaders, government officials and technical experts will improve their knowledge of the scope and constraints of insurance vis-à-vis the risks covered.

Strategy to be developed: This activity is intended to directly address the men and women producers of the areas and productions shown as potential beneficiaries of the pilot plans by the feasibility studies. At least three local workshops are estimated per year, one in each area of application of the Pilot Plans.

The workshops will work with the following topics: understanding the insurance contract; covered risks; the meaning of the premium; general and specific terms and conditions of the policy; how to report losses; how to calculate compensation; etc.

The capacity-building actions of the workshops will be strengthened by means of printed material, primers and training booklets, with examples and applications.

This training is very important to improve the knowledge of the scopes and constraints of insurance vis-à-vis covered risks; the better the understanding of the instrument, the higher the adoption of these instruments will be by small-scale agricultural producers. The participation of the leaders of the producers' organizations is also very important for the members of the community to be able to voice their doubts or inquire about the actions required during the implementation of the Pilot Plans.

A training workshop will also be held for government officials and technical experts on the scope, constraints, advantages and results of risk transfer instruments in general, and insurance in particular.

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

Expected results:

- The technical experts of the area have the required knowledge to implement systems to optimize water resources and act as trainers in implementing improvements in the efficient use, catchment, harvesting and storage of water in the communities where they work, by providing them with technical assistance and supporting them in the development of the proposed systems.

- The producers of the communities supported by the technical experts are acquainted with and adopt measures and strategies for the efficient use, catchment, harvesting and storage of water.

Strategy to be developed: The strategy is based on the training-of-trainers methodology in which the field technical experts first strengthen their technical abilities with the help of subject specialists to be then able to efficiently train and accompany the producers of the communities they are supporting.

Emphasis will be placed on the transfer of knowledge and learning through the interrelation of theory and practical activities. Meetings will be organized with specialists in the topics to be addressed including hypothetical triggers. These instances will be complemented with workshop group work guided by methodological facilitators. Once the level of theory is achieved, action learning will be encouraged engaging the participants in on-site adaptation practices in the working communities of the different areas of intervention.

A specific place will be chosen to constructively develop each of the systems proposed to improve the efficient use, catchment, harvesting and storage of water as part of their training and jointly with the training participants.

Each multiplying agent who participated in the above-described training will in turn recreate the theory and practice learnt, directly engaging the producers of the community with which it works.

INTA's professionals specialized in the systems proposed to improve the efficient use, catchment, harvesting and storage of water will accompany and strengthen the role of the field technical experts by doing a follow-up of the communities in which the planned systems are implemented.

In this way, we expect to achieve a multiplying effect in learning about the implementation of each of the 4 systems detailed below:

a. Drilling of boreholes to access underground water in quantity and quality

The theory and practical topics to be developed will be: the use of satellite images to determine places for drilling; the use of geoelectrical prospecting equipment; water potential study; analysis of chemical quality; assessment of water suitability for different uses; evaluation and determination of the most adequate drilling and pumping systems; use of the rotatory mechanical system to drill underground wells; equipment maintenance and conservation. Two theory and practical 3-day workshops will be held in places to be determined. They will include hypothetical triggers and on-site practices.

b. Design, conditioning and construction of roofs retrofitted for rainwater catchment, and construction of associated cisterns to be used as reservoirs.

The theory and practical topics to be developed will be: retrofitting and waterproofing roofs; construction of dismountable roof structures; implementation of channelling systems by means of gutters, filters and reservoirs or cisterns; construction of underground and ground wells; installation of a pre-filtering and filtering system; water treatment; installation of extraction pumps; rights and obligations for water use by the community, and for system operation and maintenance; drafting of a regulation for the use of community systems.

Three theory and practical 2-day workshops will be organized in places to be determined, addressed to multiplying agents (technical experts). They will include theoretical conceptualization triggers and activities will be developed implementing the systems in producers' own properties.

In the second stage, the technical experts will multiply the experience together with the producers in the different communities of the project's areas of intervention throughout the entire execution of the project.

c. Development of water catchment and storage systems. Building of community reservoirs for small and large livestock.

The meetings will focus on theory and practical contents about: the use of open-air reservoirs; design and construction of community reservoirs; catchment, channelling and storage; use of a traction hydraulic backhoe; construction of sediment chambers; safety measures in the reservoir surroundings; equipment maintenance, planimetric and altimetric survey of inflow basins; complete station with geodesic GPS.

Two theory and practical 4-day workshops will be organized in places to be determined, addressed to the multiplying agents (technical experts). The workshops will provide theoretical contents and will enable action learning.

In a second stage, the technical experts will repeat the experience with the members of the communities where they work, developing the activities already committed under the project.

d. Multipurpose water supply system for human consumption, animal watering and irrigation of orchards, fruit trees and pasture.

The capacities of the professionals will be strengthened by addressing the following topics: use of rainwater through the use of reservoirs; supplementary use of underground water; suitability limits for each use (human consumption, animal watering or irrigation); construction of wells lined with casing and "spider legs" hole systems; aspects to be taken into account about the use of water stored in reservoirs; ground systematization for rainwater catchment; installation and use of high-performance windmills; construction of sand filters; water treatment for human consumption, drip irrigation and animal watering; installation and appropriate use of drip irrigation systems.

Five theory and practical 3-day workshops will be organized in places to be determined, addressed to technical experts. These workshops will deliver the contents from a theory and practical perspective.
The technical experts will then recreate the knowledge acquired together with the producers for the beneficiaries of the project activities.

3.1.7 Optimization practices of agricultural, farming and forestry production management in each area of intervention.

Expected results:

- INTA's and SSDRyAF's technical experts increase their responsiveness to the adverse effects of climate variability in the production systems.

- The producers of the communities supported by the technical experts adopt new adaptive measures to climate variability in their production systems.

Strategies to be developed:
Technical experts are expected to improve their knowledge of practices that enable facing Climate Change effects in production, so as to be capable of directly training the producers and providing adequate answers to the changes affecting traditional production practices. Like in the previous case, the module's strategy prioritizes a participatory and first-hand experience approach. The meetings addressed to field technical experts will include theory and practical aspects and be led by subject specialists present at INTA's experimental stations in the different regions, and will be facilitated by professionals specialized in the methodological aspects of group management and training activities.

Action learning will then be enabled, engaging the producers who are project beneficiaries in practices carried out in their own properties.

Below is a detail of the aspects to be dealt with in the optimization of farming, agricultural and forestry production management training:

a. Assistance to indigenous populations in building fruit and vegetable gardens with irrigation and in raising small animals.

These meetings will focus on training in sustainable resource management in a climate change context; awareness strategies, gender and division of the household work into productive and reproductive tasks; techniques to enable intercultural knowledge transfer; efficient use of backyards; management of vegetable species and small farm animals; optimization of irrigation and of an efficient use of water; supply and availability of staple food for the family group; generation of marketable surplus.

A 2-day workshop will be organized for trainers at the field technical expert level. The workshop will deal with the technical and production aspects mentioned above and with social and community intervention tools for working with indigenous and native peoples. Then, group workspaces will be enabled by means of 1-day annual meetings with the producers to interchange and share problems and learning, supplemented with ongoing technical assistance at the producers' homes.

b. Management and use of forage resources.

The capacity of professionals will be strengthened in relation to the management and use of forage resources to adapt to climate change; sustainable and profitable forest grazing systems; use of mega thermal forage species; management and combined association of species; use of multi-purpose species: tuna (*Opuntia ficus*) cultivation; creation of forage reserves: making straw bales, rolls and microsilage.

Four 2-day workshops will be organized addressed to technical experts in each of the 4 provinces.

In a second stage, the training methodology will be replicated in each of the provinces so as to train producers in the locations described in Output 1.3.

c. Implementation of soil management techniques by means of contour ploughing and/or the incorporation and management of cover crops and green manure

The training of technical experts in soil management and conservation will include the following topics: water erosion; management techniques for flood-prone soils; contour ploughing; management of systematization equipment; use of cover crops and green manure.

Like with the other contents, priority will be constantly given to the synergy of the theoretical contents supported by the training activities-actions, by means of field implementation and practices in producers' own fields. Then, the field technical experts trained will be in charge of strengthening the capacity of producers as regards soil management techniques to recover degraded soils and the implementation of feasible technological options to mitigate and adapt to the climate change.

Three theory and practical 3-day workshops will be organized addressed to technical experts on contour ploughing and the use of cover crops in the provinces of Chaco, Corrientes and Santiago del Estero. In a second stage, the technical experts trained will make at least 10 field trips to the different provincial departments together with the producers who are project beneficiaries, where they will deal with aspects of soil management and use of cover crops and green manure from a theoretical and practical perspective. The support given to producers will be supplemented with ongoing assistance throughout the project.

d. Adaptation to extreme temperatures by means of crop protection structures

This workshop will share theory and practical aspects relating to technological measures to protect crops from temperatures: construction and use of macrotunnels for horticulture and floriculture crops; use of greenhouses to protect from late and early frosts; construction of shade-cloth structures for growing crops; implementation of irrigation systems.

Three 2-day workshops will be organized addressed to technical experts in the provinces of Chaco, Santiago del Estero and Santa Fe. Practices will consist in building structures for crop protection, managing crops in greenhouses, and installing and using irrigation equipment.

The technical experts will then replicate these practices to enable producers learning through ten 2-day training sessions in departments of the above-mentioned provinces.

e. Addition of equipment and improvement of facilities

Finally, an analysis will be made on aspects relating to animal health and welfare in areas likely to be affected by climate change phenomena: best practices for stock management; design, construction and accommodation of appropriate infrastructure for managing large and small livestock.

These contents will be given in one 1-day training session addressed to the technical experts of the provinces of Chaco, Santiago del Estero, Corrientes and Santa Fe.

These technical experts will then share these practices with the producers, providing them with ongoing assistance throughout the execution of the project by means of support visits and participatory meetings for a joint construction of knowledge.

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

The training addressed to government technical experts must allow sustaining the follow-up systems of water availability and climate variability at a regional and local level, strengthening the creation of interdisciplinary work groups that ensure the continuity of such systems after project completion.

The accomplished adoption of new monitoring instruments and networks and the use of new methodological tools require not only training in technical aspects but also a necessary change of culture of the government units that must ensure the implementation, development and maintenance of component 2.

Expected result: Government technical experts support the follow-up systems of water availability and climate variability at a regional and local level.

Subcomponent 3.2 is divided into 4 main topics:

3.2.1 Installation and maintenance of automatic stations

Expected result: Technical experts from government and local institutions install and maintain automatic stations.

Strategy to be developed: A theory and practical course will be given to technical experts of government and local institutions on the aspects to be taken into account when determining the location of the stations, the techniques to evaluate the correct operation of the sensors, etc. A best practices manual for the installation and maintenance of meteorological stations will also be drafted.

3.2.2 Use of the Early Warning System

Expected result: The producers make their own decisions for managing their crops based on reports generated by the monitoring of soil water reserves. Decision-makers at a government level coordinate actions to mitigate the adverse effects of climate variability.

Strategy to be developed: Workshops will be organized to explain the scopes and constraints of this tool and its potential application in the decision-making process to prevent and/or mitigate climate risks. Monitoring soil water reserves for different production activities and short and medium term forecasts will allow producers to have more information for their decision-making and crop management. Moreover, at the level of government decision-makers, the training workshops will focus on the analysis of climate trend models and the impact of ENSO's phenomena, and will be aimed at

coordinating actions to mitigate the consequences on small rural economies, especially in relation to extreme weather phenomena.

3.2.3 Dissemination of information generated by the EWS

Strategy to be developed: Several strategies will be designed and implemented to disseminate the information generated by the EWS. For instance, via web for technical experts and other means of communication for small-scale producers (radio bulletins, messages to mobile phones, public service announcements, etc.).

3.2.4 Strengthening of capacities of INTA's and MAGyP's national units

Strategy to be developed: Coordinating the participation of 4 specialists in international professional development courses or seminars.

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 project seeks to assist at least 4000 families through direct investment in adaptation measures and the implementation of two pilot insurance plans. More than 6000 producers units will benefit with the implementation of 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.

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, Neuquén, 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 UCAR[i] 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.

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

The project aims at providing specific solutions to the negative impacts of climate change and its variability to a population of small-scale agricultural producers who live in one of the most socially, economically and environmentally vulnerable areas. The beneficiaries supported by the project will, after its execution, be able to start resolving situations with reference to which they have demanded actions from both the national and the provincial government.

The resources to be supplied by the project will allow moving forward in the climate change adaptation processes which, otherwise, without such resources, could not take place with the necessary promptness. According to an analysis made by INTA's own technical experts, this initiative will allow accelerating the processes in about ten years, considering the entity's degree of involvement as regards this issue. Moreover, as a consequence of the drafting of the proposal and its future implementation, the institution has started to recruit experts in adaptation issues to support the development of the process.

As described in the sustainability section, the level of commitment of the Argentine Government and the intervening institutions is such that all execution expenses will be borne by each agency, and so the project execution cost will be zero. This shows a clear intention of the different government areas involved to incorporate this issue into their strategic planning from project start-up. Also, by reducing the execution and implementation expenses, a high percentage of resources will be allocated to specific actions to accompany the adaptation processes of small-scale producers, and to building a capacity within the institutions that has not yet been installed.

The multiplying effect of the project outcomes will be reflected on the training of technical experts and government officials in addressing climate change, incorporating it into future activities. This will be the starting point for the replication of activities in other geographies of Argentina through the INTA's institutional structure.

Furthermore, this initiative will specifically contribute to the development of the National Climate Change Adaptation Strategy, where the subsistence agriculture segment is one of the items being considered. The results achieved, the lessons learned and the identified barriers will encourage future activities in the segment, allowing fine-tuning the intervention based on the experienced gained.

The proposed actions will benefit over 4,000 of the most vulnerable families in the country. The project will provide the tools, the infrastructure works, the risk transfer mechanisms and the training they have been demanding for years, demands that, for several reasons, could not be met. In addition to the direct beneficiaries, and bearing in mind replicability, one of the largest impacts expected from the implementation is the development of capacities at an institutional level on an issue that, so far, has not been addressed with the urgency it requires. The uniqueness of the proposal will cause a

multiplying effect on the technical areas of the different institutions, allowing its implications to pervade many of the activities carried out by these organizations on a daily basis.

The cost of inaction not only entails the migration of the most vulnerable populations to the poverty belts in the urban outskirts characteristic of the developing countries, but it may also lead to an increase of mortality in the region given the deprived conditions of a large part of the population. All this would have an elevated social and political cost if this reality were to be left unaddressed. Thus, one of the purposes of this proposal is to increase the resilience of beneficiaries so they can evolve in a climate change context that will keep escalating over the next decades.

The proposals outlined for the project are the consequence of an intensive cost-effectiveness analysis by the technical experts of the participating entities. The alternatives assessed do not allow achieving the expected benefits in view of the available resources, whether due to extremely high prices or to technical and geographical issues.

The project provides for the development of an early warning system based on the improvement of the installed environmental monitoring capacity. The EWS and its ancillary tools will allow moving forward in the protection of the property and lives of both humans and animals, in addition to contributing to a better understanding of the physical and biological processes associated with the climate change.

The risk transfer component seeks to correct a market failure, that is, the lack of interest from the private sector in creating coverage tools for the most vulnerable populations. Government's involvement through the Agricultural Risk Office, coupled with the requested resources, will enable the provision of a coverage system for the populations most vulnerable to climate impacts, making it possible to guarantee the production and subsistence goods of the beneficiaries.

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.

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 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. Meetings were held during 2010 and 2011.	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.)
PRODERNEA – ORA Experience of agricultural micro-insurance for small-scale horticulture producers of the province of Corrientes. The PRODERNEA granted support to small-scale producers producing	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	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

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.	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).	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.

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 m2 (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 impact on agricultural production. Water stress and surplus charts for crops developed so far are for the Humid Pampa and for Chaco.

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 (***see activities and description under 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 allow 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.

Consultative process for Concept Note preparation:

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 hydrometeorolgical 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
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 Ñandubay
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

In early 2012, 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, it 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.

Consultative process for Final Project Proposal preparation:

During project formulation, a series of activities were conducted, 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.). This process enabled 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.

The first step of this process was undertaken on the 6th December 2012. A workshop titled "Adaptation and resilience of the small-scale agriculture producers of the Northeast Argentina (NEA) facing the impact of climate change and its variability". This workshop, held in Resistencia, Province of Chaco, gathered about 35 specialists from INTA based locally, in the whole project area (4 provinces). These specialists have the most accurate knowledge about local necessities and conditions of the small-scale producers.

The four institutions that are part of the project (the three Executing Entities and the Implementing Entity - see Part I and Organization Diagram in Section III.A) organized the workshop and played an active role in the development of the sessions, whose main objective was to introduce and to progress in a joint effort with the input for the project formulation. Thus, the desired results were:

- Ensuring that the participants know the project
- Obtaining from the participants definitions of actions to be undertaken for Component 1 of the project

The activities included oral presentations about the project and work in groups for the definitions of actions. Preliminary lists of actions for the three core concepts of Component 1 (water use, transfer of risks, and agricultural practices – please refer to Section II.A) were satisfactorily obtained. These would serve to the different participating institutions to complete the project formulation as it is defined in the present document. At the end of the sessions, the whole group was gathered in order to share opinions on the needs of training, directed both to the professionals on site and to the small-scale producers, based on experience and on the well understood principles

of the project discussed during the day. The results of this brainstorming were used as input for Component 3 (Generation of local and regional capabilities). Further details of the workshop, including the list of attendants and preliminary lists of actions, can be found in Annex A. Additionally, a summary can be found published on various internet sources[9].

On 10th January 2013, a meeting was held with leaders and representatives of the indigenous communities in Pampa del Indio, province of Chaco, one of the areas identified by INTA to develop the activities corresponding to component 1. The participants agreed that water supply is a top priority for local communities, and only after solving such priority can any more thoughts be given to production. The project's general idea was accepted, and it was agreed that the technical proposal of dams and reservoirs is the more feasible proposal for the area. Afterwards, leaders and representatives of the communities made a series of questions, requests, and recommendations, which were taken into account during the formulation of the project. These were focused on prioritization criteria for the communities that would benefit from the activities; participation of the communities in the decision-making process, training activities, need of comprehensive technical surveys to be conducted accommodating local knowledge, among others. For further details, please refer to Annex A.

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

[9] INTA Informa, 27 December 2012. "Adaptación y cambio climático: estrategias para los pequeños productores del NEA": http://intainforma.inta.gov.ar/?p=15078

Nearural, 27 December 2012. "Agricultores familiares debatieron sobre cambio climático en Chaco": http://caa.nearural.com/ampliar.php?id=20553

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 no-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.

Component 1: Enhancement of the adaptation capacity in the face of climate change and variability of NEA's small-scale producers.

Baseline (without resources from the Adaptation Fund)
The livelihood of the beneficiaries selected to receive assistance through this project is tied to natural resources. Adaptation capacity of these communities is extremely low, partly on account of their poverty levels, but also on account of adverse climate conditions, including climate change and variability affecting water availability (for human consumption and production uses), crop yield, and livestock survival (on account of both periodic droughts and floods).

In scenarios of extreme events, the communities have a very limited response capacity and have no tools to adapt to the new conditions. The demand for elements to protect their assets has appeared over and over again during the last years, particularly regarding water resources management as well as techniques that may allow to improve crop yield upon harvests and pasture yield to feed their animals with.

Furthermore, given the relative size of the families involved, the private sector has failed to develop any risk transfer mechanism which may allow to adequately insure the means of production to prevent any impacts and their consequences from encumbering the more vulnerable.

Without resources from the Adaptation Fund, the level of exposure of the communities to climate change impacts will continue to grow, which will lead to scenarios of extreme poverty, migration towards urban centers - which will in turn contribute to generating urban indigence areas - and will delay the development of one of the poorest and most vulnerable regions.

Additionality (with resources from the Adaptation Fund)
The Adaptation Fund resources, under this component, will allow to carry out a series of specific interventions aiming at increasing the communities' resilience in the face of adverse effects of climate change and variability. The specific activities will promote water resource management systems, to enable the capture and storage of water in times of abundance for subsequent use in drought periods. The characterization and use of groundwater will also be furthered in areas where such may be feasible.

Additionally, the adoption of best agricultural practices is intended combining technologies applicable specifically to each type of production areas and crops, intended to produce better yield, higher quality and more steady productions, while preserving natural resources of rural settings and adapted to face climate change.

The climate factor is essential as it is an external threat that need be addressed as a whole through insurance instruments or the application of prevention tools, all of which require funding, currently out of reach of family agriculture producers with scarce resources. The project will allow to conduct a feasibility study and the design of two pilot programs which will give rise to any required risk transfer mechanism to extend coverage to a sector of the population who has no access to such fundamental adaptation and risk reduction measures.

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

Baseline (without resources from the Adaptation Fund)
To date, INTA [National Institute of Agricultural Technology] has in place a series of stations in the project's area of intervention, which fail to satisfy the density requirements set forth by the WMO. Likewise, any outputs currently generated, either by INTA or by ORA [Office of Agricultural Risk] in terms of climate change and risks fail to introduce these variables into the local development plans as information is fragmented and spatially irrelevant. Without the resources of the Adaptation Fund, the capacity of local authorities and technical experts participating in INTA's extension work will not be enough to integrate the climate variable into the design of their projects and programs.

Even more, the region does not have a warning system in place which may allow the population and the authorities to foresee any extreme events or changes of environmental conditions for preventive and preemptive decision-making.

Additionality (with resources from the Adaptation Fund)
The support from the Adaptation Fund will allow to move forward along various work lines regarding the management of climate information. First, with the purchase of new monitoring networks and the conversion of the existing ones to widen the range of variables analyzed, not only will coverage density of the region be improved but this information will allow the development of different analyses with so much detail and quality impossible to attain today. Regional networks will be enhanced both in terms of quantity and quality, helping decision-makers when designing work plans.

The design and implementation of an early warning system – and any tools associated with it – will allow on the one hand to enhance the protection of production assets of the communities, and on the other hand, improve the analysis of climate trends and scenarios, assess variability and vulnerability associated, and also contribute to regional and national objectives for improving analysis capacity of climate processes and their integration into planning.

Component 3: Generation of local and regional capabilities regarding climate change and variability impacts, and the implementation of adaptation measures

Baseline (without resources from the Adaptation Fund)
Presently, professionals working with Family Agriculture producers and aboriginal population in rural development activities do not normally have in mind the implications of climate change and its effects upon production systems of the regions where they work, and usually do not have responses or solutions in face of phenomena generated by climate variability.

Furthermore, the level of understanding by the national, regional and local authorities on this matter, and the potential integration thereof as a key element when planning specific actions are limited. This leads to material losses and in some cases, human

losses, which could be prevented with the implementation of adaptation and risk reduction measures.

Without the support of the Adaptation Fund, communication of information around this subject and training of all key actors will remain low, with the persistence of institutional vulnerability regarding implementation of adaptation measures, and the beneficiaries will continue to have an insufficient capacity to reduce risk conditions.

Training of producers, technical experts and decision-makers is key in order to integrate in the short term any required adaptation considerations to face any observed and projected changes.

Additionality (with resources from the Adaptation Fund)
Resources assigned to this component will enable the design of a repertoire of actions aimed at generating specific capabilities (management of an early warning system, different techniques of sustainable water management and land use, insurance development, gender-based considerations and matters related to aboriginal peoples, among others) diversifying and strengthening the adaptation capacity of a widely varied group of key stakeholders.

From the national level down to the local actors, the project will deploy a mesh of knowledge and capacity-building which will become the springboard for future adaptation actions, echoing the experience and lessons learned in other regions of the country. This will result in a strong institutional anchoring, going from a merely conjuncture-type response to a structural response, with the mid-term and long-term as targets.

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

In order to train the communities to make them capable of managing risk and uncertainty, the change processes need to be driven bottom-up and top-down. To bring about change on a local scale, the measures need to be focused on the communities and be supported by top-level political commitment, the transfer of resources and decision-making.

In the area chosen for project implementation is present the Argentine Ministry of Agriculture, Farming and Fishing through the National Institute of Agricultural Technology (INTA) with 8 Experimental and Research units (Experimental Stations and two Institutes specialized in Small-scale Agricultural Producers) and 44 Rural Extension Agencies. Also, the Under-secretariat of Small-scale Agricultural Producers and Rural Development (SsAFyDr) has offices and technical staff in the 4 provinces where the project will be implemented. This significant institutional presence and the strong involvement of the Federal Government committing human, technical and economic resources, guarantee the maintenance and intensification of the actions to be undertaken under the project.

Another one of the project virtues - in addition to improving the quality of life of thousands of families of small-scale agricultural producers through adaptive actions in their production systems, guaranteeing the permanence of families in the rural environment and preventing their migration to the poverty belts in the urban outskirts - is precisely that it inserts the Climate Change adaptation issue in the public agenda both in the political and institutional sector and the technical sector (agricultural research institutions and rural extension systems), and in producers' organizations based on project implementation. From this point of view, the project will break new ground in reaching the required inter-institutional agreements to address the Climate Change issue and Small-scale Agricultural Production in a joint and coordinated manner, building on the State's synergy and integration of actions in the above-mentioned territories. The impacts of climate change, the vulnerability, the adaptive capacity and the adaption barriers are specific to each place and will change throughout time, but the processes required for the adaptation to support the most vulnerable ones will be similar.

The project also seeks to build and install local and regional technical capacities, in addition to national capacities, which are conscious and trained in Climate Change issues and Small-scale Agricultural Production in the context of rural development. These acquired capacities will empower over time the activities of the participating institutions as regards research and extension, strengthening the existing ones and creating new ones, on the understanding that the relationship between climate change and small-scale agricultural production is still a neglected area for many scientific and technical institutions in our country.

In this sense, the INTA develops a program destined for small-scale agricultural production in the project's area of intervention called Federal Program of Assistance for Sustainable Rural Development (PROFEDER) that works towards rural development from a technical, productive, socio-economic and organizational point of view. The Climate Change adaptive actions under the project will allow reconsidering, reorganizing and incorporating new lines of work – both research and extension work – that would include the Climate Change adaptability component so far not addressed from this perspective in the rural development activities. A key element of adaptation is then the role played by the government and the local services. They must have the required capacities and resources to act as intermediaries and link all processes driven bottom-up and top-down.

Another crucial part is the design and implementation by the communities of the adaptive strategies suitable for their area. The project takes on a strong commitment to address the water issue, which is one of the most important demands made by the small-scale agricultural producer organizations. In order to ensure the success and sustainability of these activities, the project proposes to factor in both local conditions and cultural traditions so that actions truly respond to the need of the natural environment and of the community that lives in it. It also places significant emphasis on the participation of women as they are one of the primary users of this resource by

being typically responsible for the household supply of water for reproductive chores (cooking, washing, cleaning, and personal hygiene) and productive chores (irrigation).

Accordingly, the actions related to the water issue are circumscribed to the overall management of the basins and guarantee the following:

- Comprehensive water management
- Dissemination of water knowledge
- Addressing the population's water use and supply priorities
- An increase in investment to achieve water supply
- The monitoring and follow-up of any actions to be performed.

Investment in the equipment to be purchased under the project is crucially important for the planning and strengthening of the activities related to the water component over time and will go beyond the operating life of the project. The current availability of drilling machines, geoelectrical equipment, hydraulic shovels, etc., in the regions, enables their continuous use by the existing producers' organizations and institutional structures of agricultural extension, covering at low cost the demand for comprehensive water management voiced by the communities of small-scale agricultural producers.

The appropriate technologies proposed for the water component – many of them validated in contexts of comparable use in rural areas within the country – together with the above-mentioned equipment, will enable the extension of adaptive actions with practical, efficient and low-cost solutions. In the short term, they are expected to cause a multiplying and exponential effect in adoption by new producers.

Likewise, the actions jointly developed with the producers based on the implementation of the project in many cases work as pilot or benchmark experiences to bring to light the efficient adaptive measures that would then directly influence, in one way or the other, the future rural development activities in the territory. The institutional programs that will continue working in the areas of intervention of the project may build on these examples to use them in their development activities with the rural population consisting in training, multiplication and dissemination.

In the execution of the following components: Implementation of improvements in the efficient use, catchment, harvesting and storage of water and Optimisation practices of production management, the intention is to have the largest portion of the economic resources requested under the project allocated in a way that directly impacts on producers' parcels. This measure to optimize the economic resources requested is made possible as a result of the commitment assumed by the INTA based on its institutional capacities in the areas of intervention of the project, by undertaking to provide the necessary human, technical and economic resources available in the region so as to guarantee the technical assistance and training activities required for proper project implementation, during the term of three years.

In short, the project will rely on the joint combination of the activities driven bottom-up and top-down as a basic measure of sustainability.

In the first place, the producers themselves, the communities and the technical support teams will develop and adjust a series of effective solutions for each need. In the second place, means will be generated to enable access to information since, although agricultural producers are quite conscious that the climate is changing, they need more specific information on climate change as a whole so as to be capable of making informed decisions about what to do in the future. In the third place, these solutions can only be implemented in a sustainable manner over time in an enabling environment, which requires raising awareness of the problem, financial means, technical advice, and government decision, all of which are contemplated in this proposal.

The sustainability of the monitoring systems, network integration and the development and maintenance of the early warning system (component 2), is specially guaranteed by two key factors. First of all, the commitment of the federal government and the participating entities (INTA, ORA) to bear a large portion of the execution expenses reveals from the start the importance given to this project, which is identified as a strategic line in the processes to adapt to the adverse effects of climate change and, particularly, the support of the most vulnerable communities having the least amount of resources. In the second place, the intrinsic structure of component 2 entails that any proposed result must become institutionally inserted into the participating entities, with the latter's commitment to maintain it in their daily operations. This is merely a starting point for the strategic incorporation of climate change considerations into the sustainable development plans.

Based on the risk transfer topic (component 1.2), and like in the previous cases, the Agricultural Risk Office's participation clearly establishes that every effort made within the framework of this project must be capitalized and added to the activities already under way. Moreover, some of this project's beneficiary provinces are already working towards appropriate legislation to move forward in the development of an insurance scheme for small-scale agricultural producers. This not only defines de legal framework to which the performance of the proposed activities will be circumscribed, but along the evolution of this initiative, the related parties are expected to adopt the implemented measures and lessons learnt to finally establish a scheme that would contemplate such producers who, for capitalization reasons, are not taken into account by the private sector without government's support.

Finally, considering the project as a whole, it is important to highlight that UCAR's accreditation as a National Implementing Agency before the Adaptation Fund is not a circumstantial action but rather the result of a long process in which the Federal Government has supported the adaptation activities, as it recognizes the challenges being faced, particularly in the agricultural sector, which is one of the most sensitive ones to climate change and, also, one of the most important ones as the basis of sustenance of the most vulnerable groups.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The UCAR (Unit for Rural Change), which falls under the Ministry of Agriculture, Farming and Fishing (MAGyP) to which it reports, has recently been rated as **National Implementing Entity** 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. The UCAR will be responsible for ensuring that the objectives and components of the project are delivered, and that resources are allocated and disbursed in an efficient and effective manner. The UCAR will have the technical and administrative responsibility for applying AF inputs in order to reach the expected Outcomes/Outputs as defined in this project document. The UCAR will be responsible for the timely delivery of project inputs and outputs, and for the coordination of all other responsible parties, including other government agencies, regional and local government authorities. The UCAR will carry out the monitoring and evaluation activities as well as the supervision of the territorial actions coordinating, supervising, and supporting the activities of the Technical Implementation Unit (see below). The UCAR will be responsible of ensuring that the project produces the results specified in the Project Document to the required standard of quality and within the specified constraints of time and cost. It will ensure:

- Appropriate allocation of resources
- Transparency
- Consistency between project's actions and objectives
- Dissemination of the outcomes.

The UCAR will be fully accountable for the effective implementation of this project, holding, apart from the above mentioned obligations, the operative responsibility of the execution of the project.

The **Steering Committee** will provide general guidance of the project. This Committee will be composed of designated senior-level representatives from the INTA (National Institute of Agriculture Technology), ORA (Office of Agricultural Risk) and Climate Change Office of the Secretariat for Environment and Sustainable Development). The main function of the Steering Committee would be to provide political strategic leadership to the Project, creating effective coordination among the highest level environmental authorities involved at the national and provincial levels. This will ensure the alignment of the Project with the government strategies and programs underway in the territory ensuring the consistency of the interventions at both jurisdictional levels. In addition, this Committee will ensure transparency with regard on the Project's intervention processes. Members of the Steering Committee will be designated during the first quarter of the project.

The project's technical implementation shall be in the care of the **Technical Implementation Unit**, composed by the following institutions:

- Office of Agricultural Risk (ORA), as part of the Ministry of Agriculture, Farming and Fishing (MAGyP), that will be focused on developing the mechanisms for risk transfer (under Component 1) and provide related training (Component 3);
- The National Institute for Agricultural Technology (INTA), which will guarantee that water and agricultural practices are implemented (Component 1) and that the strengthening of information, monitoring and climate information management systems is ensured (Component 2). The INTA will as well provide training related to these aspects (Component 3); and,
- the Climate Change Office (DCC), as part of the Secretariat of Environment and Sustainable Development, that will participate in project coordination, knowledge sharing and training procurement.

Each of these executing institutions will appoint a **Leader**, together with a team and technical assistants as needed, who will be responsible for the project's day-to-day operations. The Leader's function will be to supervise the execution of the assigned modules, the drafting of the assessment reports, and to coordinate, supervise, and support the activities of his corresponding Output. He will be responsible of ensuring that the project produces the results specified in the Project Document to the required standard of quality and within the specified constraints of time and cost. The Leaders will be supported by the UCAR in order to maximize their reach and impact as well as for the delivery of quality products. Leaders coordinating the different Outputs will be part of an **Execution Coordination Committee**, which will hold a monthly meeting with the participation of UCAR with the objective or sharing the updates on the execution of the project.

Implementation of Outputs 1.1, 1.3 and related training will rely on the provincial units of rural extension of the INTA. They will lead the Project´s interventions in the field and will report to their corresponding Leader. These units shall be staffed by experts that are strongly linked to the territory allowing it to organize actions by engaging the key stakeholders, maintaining a fluid communication with municipal authorities and agencies, as well as with public and civil society organizations. They will constitute essential interlocutors for managing perceptions of the outcomes at the local level and ensuring local cooperation. It is important to mention that during the consultation processes for the preparation of the final proposal, local agencies, producers' associations and community leaders were identified for their engagement in the decision making and implementation processes.

Implementation of Output 1.2 will be carried out by the technicians of the Office of Agricultural Risk with representatives of the provincial governments.

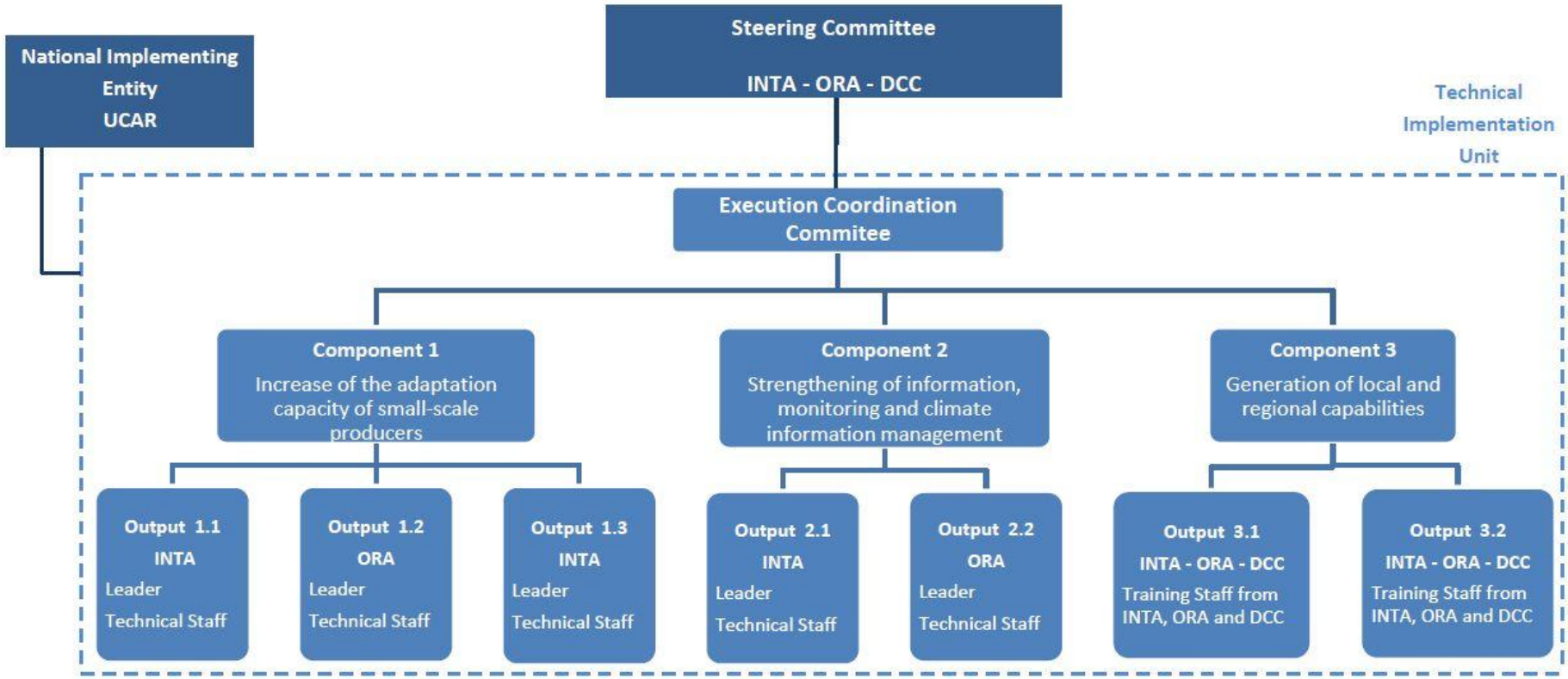
Implementation of Outputs 2.1 and 2.2 will be in charge of the staff of INTA experimental stations dedicated to agrometeorology, and of the provincial bodies with experience in this matter. The development of the EWS will count with the participation and active coordination of the ORA technicians.

Regarding Component 3, given that each Output has its related training activities, these will be coordinated by the Leaders of each Output, with the approval of the Execution Coordination Committee. The organization will be structured based on the execution Schedule of the Outputs' activities on site.

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.

The organization chart of the project is presented below.

Figure 1 - Organisation Chart



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

Key risks underlying the project have been analyzed during the formulation phase in connection with the target sites of the project. The risks facing the project and the risk mitigation strategy (countermeasures) are summarized below:

Type	Risk Description	Level	Mitigation Strategy
Political	There is a risk that the decisions and actions taken during the project may not be ratified by future administrations.	M	The project has been marked as high priority by the GoA because of its innovative nature. The compromise of each of the participating institutions is clearly reflected in the internalization of the project execution costs, by allocating human and physical resources
Political	Lack of transparency or political interference in allocation of resources	L	Local organizations have been involved in the selection of projects and screening of eligibility. The UCAR has an outstanding record of transparency and high technical standards in the allocation of grants, verified by external funding agencies as the World Bank and Inter-American Development Bank. With a vast experience in resources management, will make sure that the project meets the highest fiduciary standards.
Institutional	Not all necessary stakeholders may take part in the process with the capacity and commitment required. Afterwards, there can be resistance from some stakeholders in adopting the proposed measures.	L	The management component and the participatory meetings have been used to mitigate these risks. A training programme for community members, community leaders, and civil authorities will raise awareness about locally important issues related to climate change and adaptation.
Institutional	Staff turnover in the Project Implementing Unit. Local project counterparts could experience staff turnover that could delay project implementation.	L	No project component is conceived outside relevant, organic public structures. Every activity will be secured by institutional cooperation agreements.
Technical	Failure to obtain sufficient information to characterize the size of the changes brought about by the overheating of the troposphere.	L	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.
Technical	Activities implemented are not found to be cost-effective, in spite of the fact that cost-effectiveness was a core principle in the project planning.	L	Detailed information will be recorded regarding cost-effectiveness, with the objective of sharing knowledge between the experiences developed in all the municipalities where activities will be implemented. Cost-effectiveness indicators will be monitored and shared. All the results will be widely disseminated to be used to future adaptation initiatives. The risk is however low, since climate changes and vulnerability of the producers in the area is well known by the local INTA units located in the project area.

Type	Risk Description	Level	Mitigation Strategy
Environmental	Natural hazards (flood events, drought, storm surges, storms) hamper some efforts	M/H	The project is seeking to reduce the effect of natural hazards. However, the expected outcomes such as behavioural changes and the construction of infrastructure are at risk in the early phases of the programme. As such, priority will be given to the actions that present more impact with larger numbers of favoured producers.
Environmental	Climate variability. Changing climatic conditions could affect the success of particular adaptation measures to be piloted during the life of the project.	M	The National Institute for Agriculture Technology (INTA) has the overall institutional and farmer-level capacity building in the project area, which will enable careful monitoring of climate variability in the region, and consequent consideration of potential adjustments.
Financial	Delays in executing funding at the regional level.	L/M	- Project activities have been designed and paced to ensure a reasonable chance of completion after the timeframe of the project. - The UCAR will provide permanent support for the mobilization of funds, contracting, monitoring, and financial reporting. - The UCAR will provide specific technical assistance and management support to each agency based on the results of such assessments.
Financial	GoA is not able to leverage sufficient financial resources for the sustainability of project actions.	L	- A financial sustainably strategy for the project will be developed beginning in Year 2 of project implementation. - The project will strengthen the institutional basis for accessing public and private sources of climate change finance in the future to attract additional sources of funding.

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.

The M&E of the Project will be performed pursuant to the procedures set forth by the UCAR in line with the ones applied by the International Financial Institutions, and will be implemented by the Technical Implementation Unit (TIU) and the National Implementing Agency. The indicators established in the Results Framework will allow following-up the evolution of the achievement of each of the expected results, making any adjustments to maximize the allocation of resources, both those received from the Adaptation Fund and those contributed by each of the executing entities.

An Initial Workshop will be organized during the first month of the project implementation to be attended by the executing parties, the TIU, the Supervisory committee, responsible agents, and the UCAR as the implementing agency. The workshop will establish the execution and implementation mechanisms, as well as the finalization of the necessary agreements between the different parties to ensure transparency and efficacy in carrying out the project. The action plan for the first

execution stage, which will comprise twelve months since start-up, will be designed during this Initial Workshop.

The project will be monitored by means of six-month evaluations to supervise the progress made from the beginning of its implementation. These evaluations will help identify the lessons learned jointly with the players concerned and the beneficiaries of the project. UCAR's authorities and members of the project will perform regular visits to the project areas based on a schedule agreed in the Annual Work Plan, including the financial monitoring of the implementation.

The project will be submitted to an external and independent evaluation in the middle of its term of completion (18 months after the beginning of the project), which will determine the progress made towards the achievement of the results, and will identify any required corrective actions. The external review will focus on the progress made to reach the expected results, the status of the institutional arrangements for implementation, and the examination of the action plans. Once the project is completed, and within the following six months, an external final evaluation will be conducted to verify the achievement of the expected results and its impact and sustainability.

Below is a broken-down budget of M&E activities:

Activity	Responsible Party	Cost (USD)	Frequency
Initial Workshop (IW)	• TIU • UCAR	10,000	1st month of execution
IW Report	• TIU • UCAR		1 month after the IW
Field visit	• TIU • UCAR	18,000	Every six months (3000x6)
Measurement of proposed indicators to evaluate project performance and efficacy	• UCAR		Every six months
Technical reports	• TIU • UCAR	-	To be defined by the project team
External mid-term evaluation	• External consulting • UCAR	15,000	By the middle of the implementation
External evaluation upon project completion	• External consulting	20,000	Upon completion of the implementation
Final report	• TIU • UCAR	-	Upon completion of the

			implementation
Publications	• UCAR	30,000	To be defined
Total budget		**93,000**	

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 applicable[10].

Result	Indicator	Baseline	Target
Project Objective: 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	Number of Families vulnerable to the adverse effects of climate variability and change	There are no concrete adaptation measures being implemented up to date	By the end of the project, at least 4000 of the most vulnerable families in the project area will benefit from the proposed activities to cope with climate change and vulnerability
Outcome 1.1 Improvements in the use and productivity of water for family agricultural producers	% of producers with enhanced capacities to respond to climate change and variability	No installed capacity or infrastructure	At least 20% of families within the project area with enhanced capacities to respond to climate change and variability
Output 1.1 Implementation of improvements in the efficient use, catchment, harvesting and storage of water in the areas of intervention			
Activity 1.1.1 Drilling of boreholes to access underground water in quantity and quality	Number of boreholes drilled to access underground water	Up to date there are no boreholes drilled in the targeted communities	138 boreholes drilled by the end of the project
Activity 1.1.2 Design, conditioning and construction of roofs retrofitted for rainwater catchment, and construction of associated cisterns to be used as reservoirs	Number of families with roof retrofitted for rainwater catchment and cisterns (disaggregated by gender)	Up to date there are no reservoir and roofs retrofitted for rainwater catchment developments in the area of intervention	266 families with roof retrofitted for rainwater catchment and cisterns (year 3)
Activity 1.1.3 Development of water catchment and storage systems: building of community	Number of community reservoirs for small and large livestock built	0 Community reservoirs built up to date in the targeted communities	145 Community reservoirs built (year 3) (Estimate: 5 families per

[10] 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].

Result	Indicator	Baseline	Target
reservoirs for small and large livestock			reservoir - 739 Families assisted)
Activity 1.1.4 Multipurpose water supply system for human consumption, animal watering and irrigation of orchards, fruit trees and pasture	Number of multipurpose water supply systems built	There haven't been any Initiatives to construct multipurpose water supply systems	140 multipurpose water supply systems built (year 3) (Estimate: 1 system per family) (Estimate 1 system per family)
Outcome 1.2 Reducing the variability in income inflow of family agricultural producers, promoting their continuity in the activity and in rural settings	% of targeted population covered by adequate risk-transfer mechanisms(disaggregated by gender)	0% families within the project area with access to insurance tools	At least 15% of families in the area selected for implementation of risk transfer instruments
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			
Activity 1.2.1 Feasibility study to develop a global multi-risk insurance Pilot Plan for small-scale producers of cereals, oilseed and cotton who have not had access to any subsidized insurance program in previous periods, with a partial subsidy of the premium	Development of feasibility study	No study conducted to date	Study completed by the first year of project implementation
Activity 1.2.2 Feasibility study to develop a risk management Pilot Plan for small-scale agricultural producers whose main activity is the field-base horticulture	Development of feasibility study	No study conducted to date	Study completed by the first year of project implementation
Activity 1.2.3 Implementation and monitoring of the execution of pilot programs	Number of families included in the Pilot Programmes (disaggregated by gender)	No insurance coverage	787 families included in the Pilot Programmes
Activity 1.2.4 Evaluation of the Pilot Programmes, lessons learned and drafting of proposals and recommendations for the local governments	Evaluation of Pilot Programmes	0 evaluation conducted	Concluded by the end of project implementation
Outcome 1.3 Increase in agricultural production of small-scale family producers and	Number of small-scale family producers having more secure (increased) access to livelihood	0,8% families within the project area has been assisted in various	10% of families within the project area increasing their access to livelihood assets

Result	Indicator	Baseline	Target
reduction of economic and social vulnerability in the face of climate change and variability	assets	agriculture practices	
Output 1.3 Optimisation practices of agricultural, farming, and forestry production management in each one of the areas of intervention			
Activity 1.3.1 Assistance to indigenous populations in building fruit and vegetable gardens with irrigation and in raising small animals	Number of indigenous families receiving technical assistance (disaggregated by gender)	15 families with fruit and vegetable gardens with irrigation, and raising small animals	82 families assisted by the end of the project
Activity 1.3.2 Management and use of forage resources	Number of families assisted in the management and use of forage resources (disaggregated by gender)	29 Families assisted in the management and use of forage resources	473 Families assisted by the end of the project
Activity 1.3.3 Implementation of soil management techniques by means of contour ploughing and/or the incorporation and management of cover crops and green manure	Number of families assisted in the implementation of soil management techniques (disaggregated by gender)	0 families assisted	119 Families assisted by the end of the project
Activity 1.3.4 Adaptation to extreme temperatures by means of crop protection structures	Number of families assisted by means of crop protection structures (disaggregated by gender)	20 families assisted	272 Families assisted by the end of the project
Activity 1.3.5 Addition of equipment and improvement of facilities	Number of families assisted by technology and improvement of facilities (disaggregated by gender)	20 families assisted	109 families assisted by the end of the project
Outcome 2.1 improvement and enhancement of the capacity of monitoring and evaluating climate change and variability	Density Increase of hydrometeorological stations and pluviometers	Very low density of monitoring station coverage	20% density increase of hydrometeorological stations and pluviometers
Output 2.1 Integration and expansion of the NEA's agro-hydrometeorological networks			
Activity 2.1.1 Development, assembly, installation, adjustment and monitoring of automatic meteorological stations	Number of automatic meteorological stations fully operative	8 monitoring stations linked to SMN and INTA monitoring networks, 35 automatic stations and 22 pluviometers in the project area	18 automatic meteorological stations fully operative by the end of the project
Activity 2.1.2 Conversion of simple automatic stations into complete measuring stations	Number of simple automatic stations fully converted into complete measuring stations	0 complete stations converted	10 simple automatic stations fully converted into complete measuring stations by the end of

Result	Indicator	Baseline	Target
			the project
Activity 2.1.3 Network integration following a thorough inspection and inventory of existing automatic and collection stations	% of meteorological networks integrated	0% networks integrated	100% of meteorological networks integrated by the end of the project
Activity 2.1.4 Strengthening of Information Systems of local nodes	% of Information Systems of local nodes fully operational	0% of Information Systems of local nodes are operational	100% Information Systems of local nodes fully operational
Activity 2.1.5 Interoperability, data standards and quality, unification of agro meteorological and hydrometeorological databases of local and national institutions	% of online availability of the integrated information system	0% of online availability of the integrated information system	100% of Integrated information system available online
Outcome 2.2 Systematized and freely available basic information for effective decision making regarding adaptation of producers to adverse conditions, and for local and regional planning	Number of staff members, decision makers and producers using early warning system and climatic knowledge platform as basis for decision taking	Early Warning System only covers partially the Province of Chaco and Santa Fe	At least 25% users increase in early warning system and climatic knowledge platform
Output 2.2 Development of an integrated Early Warning and Decision-making system to assess and manage climate risks, including extreme events			
Activity 2.2.1 Compilation, integration and analysis of databases and georeferenced mapping in the area of intervention in relation to hydrological, topographical, soil, hydrometeorological, meteorological and geomorphologic characteristics	% of compilation and assessment of data bases and georeferenced mapping in the area of intervention	0% compilation and assessment performed on existing data bases and maps	100% of data bases and georeferenced maps compiled and assessed
Activity 2.2.2 Tests performed on demonstration plots to assess water requirements of cotton cultivation	Number of tests performed	0 test performed	At least 3 test performed per year of project implementation
Activity 2.2.3 Drawing of risk maps in relation to drought, water deficit and water surplus for planted and natural pastures	% of surface of the project area with risk maps	35% of project area with risk maps developed	70% of project area with risk maps developed
Activity 2.2.4 Develop a soil moisture monitoring system based on the operational	% of implementation of the soil moisture monitoring system	30% of project area with monitoring system installed	At least 60% of project area with monitoring system installed

Result	Indicator	Baseline	Target
execution of the water balance algorithm			
Activity 2.2.5 Analysis of climate change scenarios and climate trends and their impact on crop production	% of development of the analysis of climate change scenario and climate trends on crop production	No regional scale climate change scenarios available or knowledge of the impact on crop production	100% of analysis conducted by the end of the 2nd year of project implementation
Activity 2.2.6 Hydrological warning component, integrated into Early warning system	Development of an early warning system	There is no monitoring hydrological system and vulnerability based information system at appropriate scale or in place	Early warning system fully operational by the end of the project
Activity 2.2.7 Weather alert component, integrated into early warning system	Development of an early warning system	No integrate decision making system with weather alert component in place	Early warning system fully operational by the end of the project
Activity 2.2.8 Development of an integrated web platform that enables access to the early warning system	% of development of the web platform	0% platform developed	100% platform develop and fully operative by the end of the project implementation
Outcome 3 Municipal and provincial governmental units, educational settings, and producers with capabilities to generate appropriate adaptive interventions	% of staff and producers capacitated who implements measures to respond to, and mitigate impacts of, climate-related events (disaggregated by gender)	No training or capacity building activities done up to date with the 4000 families involved in the activities of the project and 200 technicians and government officials	60% of the producers trained for implementing measures at their farms and 70 % of technicians and government officials trained
Output 3.1 Development of training and communication modules on risk management and transfer for governmental technical experts and small-scale agricultural producers			
Activities 3.1.1 throughout 3.1.7	% of targeted staff members and population capacitated in predicted adverse impacts of climate change, and of appropriate responses	Non training or capacity building activities done up to date	80% of targeted staff members and population are capacitated by the end of the project implementation
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			
Activities 3.2.1 throughout 3.2.4	Number of institutions trained in the use of early warning system and	Non training or capacity building activities done up	At least 1 trained institution per province participating in the

Result	Indicator	Baseline	Target
	related tools	to date	project by the end project
Verification Mechanisms and Sources: Progress reports, surveys, site visits, training and capacity building reports, national population and agriculture census, national communications			

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.

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
Output 1.1 Implementation of improvements in the efficient use, catchment, harvesting and storage of water in the areas of intervention	1.1.1. Drilling of boreholes to access underground water in quantity and quality.	Provinces of Chaco, Santiago del Estero, Corrientes and Santa Fe	INTA	Purchase of inputs	107.864	64.718	43.146	215.728	N1
				Third-party service	14.382	8.629	5.753	28.764	N2
				Investment in equipment and infrastructure	135.054	-	-	135.054	N3
	1.1.2. Design, conditioning and construction of roofs retrofitted for rainwater catchment, and construction of associated cisterns to be used as reservoirs.	Provinces of Santa Fe, Chaco, Santiago del Estero	INTA	Purchase of inputs	142.491	142.491	71.246	356.228	N4
				Third-party service	12.391	12.391	6.195	30.976	N5
				Investment in equipment and infrastructure	-	-	-	-	N6
	1.1.3. Development of water catchment and storage systems: building of community reservoirs for small and large livestock.	Provinces of Santa Fe, Chaco, Santiago del Estero	INTA	Purchase of inputs	113.627	113.627	56.814	284.069	N7
				Third-party service	76.441	76.441	38.220	191.102	N8
				Investment in equipment and infrastructure	84.763	-	-	84.763	N9
	1.1.4. Multipurpose water supply system for human consumption, animal watering and irrigation	Province of Santiago del Estero	INTA	Purchase of inputs	39.128	23.477	15.651	78.255	N10
				Third-party service	11.616	6.970	4.646	23.232	N11

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
	of orchards, fruit trees and pasture.			Investment in equipment and infrastructure	-	-	-	-	N12
Total Output 1.1					737.756	448.744	241.671	**1.428.171**	
1.2. Implementation of a system for the management and transfer of risks for small- and mid-scale agricultural producers.	1.2.1. Feasibility study to develop a global multi-risk insurance Pilot Plan for small-scale producers of cereals, oilseed and cotton, with a partial subsidy of the premium	Chaco: General Güemes, Libertador General San Martín, 9 de Julio, O´Higgins, Fray Justo Santa María de Oro and Fontana Corrientes: Saladas, Bella Vista, San Roque and Lavalle Santiago del Estero: Taboada and Belgrano Santa Fe: General Obligado	ORA	Local consultant	22.000	-	-	22.000	N13
				Workshops and meetings	2.000	-	-	2.000	N14
				Materials	500	-	-	500	N15
				Trips	5.542	-	-	5.542	N16
				Miscellaneous	500	-	-	500	N17
	1.2.2. Feasibility study to develop a risk management Pilot Plan for small-scale agricultural producers whose main activity is the field-base horticulture.	Chaco: General Güemes, Libertador General San Martín Corrientes: Saladas, Bella Vista, San Roque and Lavalle Santa Fe: General Obligado	ORA	Local consultant	22.000	-	-	22.000	N13
				Workshops and meetings	2.000	-	-	2.000	N14
				Materials	500	-	-	500	N15
				Trips	5.000	-	-	5.000	N16
				Miscellaneous	500	-	-	500	N17
	1.2.3.Implementation and monitoring of the execution of pilot programs.	Chaco: 9 de Julio, O´Higgins, Fray Justo Santa María de Oro and	ORA	Local consultant	10.000	10.000	-	20.000	N18
				Global multi-risk insurance contract	250.000	250.000	250.000	750.000	N19

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
		Fontana Santiago del Estero: Taboada and Belgrano Santa Fe: General Obligado		Insurance contract or a horticultural fund	120.000	120.000	120.000	360.000	N20
				Workshops and meetings	2.400	3.000	3.000	8.400	N21
				Trips	5.000	5.000	5.000	15.000	N22
				Miscellaneous	1.000	2.000	2.000	5.000	N23
	1.2.4. Evaluation of the Pilot Plans, lessons learned and drafting of proposals and recommendations for the local governments	Chaco: General Güemes, Libertador General San Martín, 9 de Julio, O´Higgins, Fray Justo Santa María de Oro and Fontana Corrientes: Saladas, Bella Vista, San Roque and Lavalle Santiago del Estero: Taboada and Belgrano Santa Fe: General Obligado	ORA	Local consultant	-	-	22.000	22.000	N24
				Workshops and meetings	-	-	4.200	4.200	N25
				Trips	-	-	5.000	5.000	N26
Total Output 1.2					448.942	390.000	411.200	**1.250.142**	
Output 1.3 Optimisation practices of agricultural, farming and forestry production management in each one of the areas of	1.3.1. Assistance to indigenous populations in building fruit and vegetable gardens with irrigation and in raising small animals	In the Province of Chaco	INTA	Purchase of inputs	24.543	24.543	12.271	61.357	N27
				Third-party service	2.583	2.583	1.292	6.459	N28
				Investment in equipment and infrastructure	-	-	-	-	N29
	1.3.2. Management and use of forage	In the provinces of Chaco, Santa Fe,	INTA	Purchase of inputs	96.880	58.128	38.752	193.760	N30

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
intervention.	resources.	Corrientes and Santiago del Estero		Third-party service	9.688	5.813	3.875	19.376	N31
				Investment in equipment and infrastructure	-	-	-	-	N32
	1.3.3. Implementation of soil management techniques by means of contour ploughing and/or the incorporation and management of cover crops and green manure.	In the provinces of Corrientes, Chaco, Santiago del Estero	INTA	Purchase of inputs	38.752	19.376	19.376	77.504	N33
				Third-party service	8.073	4.844	3.229	16.147	N34
				Investment in equipment and infrastructure	-	-	-	-	N35
	1.3.4. Adaptation to extreme temperatures by means of crop protection structures.	In the provinces of Chaco, Santa Fe and Santiago del Estero	INTA	Purchase of inputs	96.880	58.128	38.752	193.760	N36
				Third-party service	4.844	2.906	1.938	9.688	N37
				Investment in equipment and infrastructure	-	-	-	-	N38
	1.3.5. Addition of equipment and improvement of facilities.	In the Province of Chaco	INTA	Purchase of inputs	32.293	19.376	12.917	64.587	N39
				Third-party service	1.615	969	646	3.229	N40
				Investment in equipment and infrastructure	-	-	-	-	N41
Total Output 1.3					316.152	196.667	133.049	**645.868**	
2.1 Integration and expansion of agro-hydrometeorological networks	2.1.1. Development, assembly, installation, adjustment and monitoring of 15 institutional Nimbus weather stations (INTA&UTN) for the densification of the	Chaco, Norte de Santa Fe, Noreste de Santiago del Estero	INTA	National Consulting Office	15.000	-	-	15.000	N42
				Hired service: Technical experts (2)	30.000	30.000	30.000	90.000	N43
				Survey - Inventory	5.000	-	-	5.000	N44
				Instruments	102.000	-	-	102.000	N45

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
	data collection network in areas with deficiency. Assembly of 3 mobile stations.			Parts - materials	30.000	-	-	30.000	N46
				Technical training workshops and sessions	-	5.000	-	5.000	N47
				Trips - Transportation	3.000	15.000	3.000	21.000	N48
	2.1.2. Conversion of 10 simple automatic stations into complete measuring stations.	All the provinces of the area of intervention.	INTA	Feasibility studies	7.500	-	-	7.500	N42
				Instruments	50.000	-	-	50.000	N45
				Trips - Transportation	-	15.000	3.000	18.000	N48
	2.1.3 Network integration.	All the provinces of the area of intervention and national entities.	INTA-ORA	National Consulting Office	7.500	7.500		15.000	N49
				Workshops - Institutional Arrangements	-	5.000	-	5.000	N50
				Equipment	-	20.000	-	20.000	N51
				Trips - Transportation	6.000	6.000	-	12.000	N52
	2.1.4. Strengthening of Information Systems of local nodes (servers, etc.).	At least 3 Governments and 3 INTA's offices.	INTA	Hired service: Professional (1)	15.000	15.000	-	30.000	N53
				Accessories	-	100.000	-	100.000	N54
				Trips - Transportation	3.000	6.000	-	9.000	N55
	2.1.5. Interoperability, data standards and quality, unification of agrometeorological and hydrometeorological databases of local and national institutions; consultation mechanism; Web Interfaces.	All intervening institutions.	INTA-ORA	National Consulting Office	7.500	7.500	7.500	22.500	N49
				Hired services: Professional	15.000	15.000	30.000	60.000	N53
				Equipment	-	10.000	-	10.000	N51
				Miscellaneous inputs	2.000	2.000	2.000	6.000	N56
				International consultant	7.000	4.500	-	11.500	N57
				Trips - Transportation	3.000	3.000	3.000	9.000	N58

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
Total Output 2.1					308.500	266.500	78.500	**653.500**	
2.2 Development of an integrated Early Warning and Decision-making system to assess and manage climate risks, including extreme events.A15	2.2.1. Compilation, integration and analysis of databases and georeferenced mapping in the area of intervention.	NEA Region	ORA/INTA	Local consultants	52.500	45.000	-	97.500	N59
				Trips	9.913	7.957	-	17.870	N60
				Materials	8.000	-	-	8.000	N61
	2.2.2. Tests on demonstration plots to assess the water requirements of crops.	NEA Region	ORA	Local consultants	22.500	22.500	-	45.000	N62
				Trips	10.000	10.000	-	20.000	N63
				Materials	10.000	8.000	-	18.000	N64
	2.2.3. Drawing of risk maps in relation to drought, water deficit and water surplus for planted and natural pastures, and crops in the area of application.	North of Santa Fe, east of Corrientes, east of Santiago del Estero, north of Chaco	ORA	Local consultants	-	35.000	35.000	70.000	N65
				Workshops and meetings	-	2.000	2.000	4.000	N66
				Trips	-	7.000	7.000	14.000	N67
				Computer equipment	-	8.000	-	8.000	N68
	2.2.4. Soil moisture monitoring in pasture and crops in the area of application through a water balance. Development of water availability scenarios.	North of Santa Fe, east of Corrientes, east of Santiago del Estero, north of Chaco	ORA	Local consultants	-	25.000	25.000	50.000	N69
				Evaluation meetings	-	2.000	2.000	4.000	N70
				Trips	-	6.000	6.000	12.000	N71
				Palisade Software	-	5.000	-	5.000	N72
	2.2.5. Analysis of Climate Change scenarios and climate Trends and their impact on crops.	NEA Region	ORA/INTA	International consultant	8.000	-	-	8.000	N73
				Local consultants	22.500	22.500	-	45.000	N74
				Dissemination and		10.000	-	10.000	N75

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
				training workshops	-				
				Trips	8.000	15.000	-	23.000	N76
	2.2.6. Development of hydrological warning systems.	NEA Region	INTA	Local consultants	15.625	15.625	-	31.250	N77
				Trips	8.000	8.000	-	16.000	N78
				Materials	5.000	-	-	5.000	N79
	2.2.7. Weather alert component, integrated into the EWS.			Local consultants	-	15.625	15.625	31.250	N80
				Workshops and meetings	-	8.000	8.000	16.000	N81
				Trips	-	6.000	6.000	12.000	N82
	2.2.8. Development of an integrated web platform that enables access to the early warning system developed.	NEA Region	ORA/INTA	International consultant	-	-	10.000	10.000	N83
				Local consultants	-	35.000	35.000	70.000	N84
				Hardware and equipment	-	50.000	30.000	80.000	N85
				Workshops and meetings	-	-	20.000	20.000	N86
Total Output 2.2					180.038	369.207	201.625	**750.870**	
3.1 Development of training and communication modules on risk management and transfer for governmental technical experts and small-scale agricultural producers	3.1.1. Raising awareness and knowledge about the need to include the climate variability issue and its effects in daily activities.	INTA'S units in the Province of Chaco	INTA	Technical training workshops and sessions	14.000	12.600	1.400	28.000	N87
	3.1.2. Training workshops on rights approach in public policies.	Buenos Aires and NEA Region	UCAR	Training workshops for officials, technical experts and extension agents.	3.500	500	500	4.500	N88

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
	3.1.3. Local workshops on the introduction to risk management.	NEA Region	ORA	4 workshops in locations to be defined	10.000	-	-	10.000	N89
	3.1.4. "Use of climate information for risk management" course.	NEA Region	ORA/INTA	Training course and workshops	12.000	10.000		22.000	N90
	3.1.5. Local workshops to train beneficiaries in insurance and other risk transfer instruments.	NEA Region	ORA/Insurance companies	Local training workshops	15.000	11.000	7.500	33.500	N91
	3.1.6.a. Drilling of boreholes to access underground water in quantity and quality.	In the provinces of Chaco, Santiago del Estero, Corrientes and Santa Fe	INTA	Technical training workshops and sessions	12.000	5.000	3.000	20.000	N92
	3.1.6.b. Design, conditioning and construction of roofs retrofitted for rainwater catchment, and construction of associated cisterns to be used as reservoirs.	In the provinces of Santa Fe, Chaco, Santiago del Estero	INTA	Technical training workshops and sessions	21.000	8.100	2.400	30.000	N93
	3.1.6.d. Development of water catchment and storage systems. Building of community reservoirs for small and large livestock.	In the provinces of Santa Fe, Chaco, Santiago del Estero	INTA	Technical training workshops and sessions	19.500	10.500	-	30.000	N94
	3.1.6.e. Multipurpose water supply system for human consumption, animal watering and irrigation of orchards, fruit trees and pasture.	In the provinces of Chaco, Santa Fe and Santiago del Estero	INTA	Technical training workshops and sessions	10.000	6.000	4.000	20.000	N95

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
	3.1.7.a. Assistance to indigenous populations in building fruit and vegetable gardens with irrigation and in raising small animals.	In the provinces of Chaco, Santa Fe and Santiago del Estero	INTA	Technical training workshops and sessions	5.832	3.499	2.333	11.664	N96
	3.1.7.b. Management and use of forage resources.	In the provinces of Chaco, Santa Fe, Corrientes and Santiago del Estero	INTA	Technical training workshops and sessions	5.832	3.499	2.333	11.664	N97
	3.1.7.c. Implementation of soil management techniques by means of contour ploughing and/or the incorporation and management of cover crops and green manure	In the provinces of Corrientes, Chaco, Santiago del Estero	INTA	Technical training workshops and sessions	10.188	6.113	4.075	20.376	N98
	3.1.7.d. Adaptation to extreme temperatures by means of crop protection structures.	In the provinces of Chaco, Santa Fe and Santiago del Estero	INTA	Technical training workshops and sessions	10.188	6.113	4.075	20.376	N99
	3.1.7.e. Addition of equipment and improvement of facilities.	In the provinces of Chaco, Santa Fe and Santiago del Estero	INTA	Technical training workshops and sessions	4.752	1.584	1.584	7.920	N100
Total Output 3.1					153.792	84.508	33.200	**270.000**	
3.2 Training and formation addressed to municipal and provincial governmental units for hydrometeorological management	3.2.1. Training course on the installation and maintenance of automatic stations.	NEA Region	INTA/SMN	Theory and practical course	6.000	8.000	-	14.000	N101
	3.2.2. Training workshops on the use of the EWS.	NEA Region	ORA/INTA	Local training workshops	-	25.000	30.000	55.000	N102

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
and monitoring, analysis of climate information, use of methodological tools and development of modules of adaptation			INTA	Local consultants	15.625	15.625	-	31.250	
	3.2.3. Design and implement several strategies to disseminate the information generated by the EWS.	NEA Region	ORA/INTA	Bulletins, brochures, manuals, radio and television spots	-	20.000	30.000	70.000	N103
	3.2.4. Strengthening of capacities of INTA's and MAGyP's national units.	NEA Region	ORA/INTA	International training course	-	20.000	-	20.000	
				Trips	-	6.000	-	6.000	N104
Total Output 3.2					21.625	94.625	60.000	**196.250**	
Project Implementation	Monitoring and Evaluation	Project Area	UCAR	Consultants	0	15.000	20.000	35.000	N105
				Initial workshop	10.000	0	0	10.000	N106
				Field visits	6.000	6.000	6.000	18.000	N107
				Publications	10.000	10.000	10.000	30.000	N108
	Total M&E				26.000	31.000	36.000	93.000	
	Project Management	Project Area	UCAR	Contractual Services - Individuals	44.160	55.200	69.000	168.360	N109
				Bank costs	3.616	3.978	4.340	11.934	N110
				Miscellaneous expenses	1.759	2.199	2.748	6.706	N111
	Total PM				49.535	61.377	76.088	187.000	

Component	Activity	Location	Responsible Party	Description	2013 Budget (USD)	2014 Budget (USD)	2015 Budget (USD)	Total (USD)	Notes
Total Project Implementation					75.535	92.377	112.088	**280.000**	
	Contingency costs				43.331	54.164	67.705	**165.200**	N112
TOTAL COST OF THE PROJECT					2.285.672	1.996.791	1.339.038	**5.640.000**	

Budget Notes:

N1	Purchase of inputs and materials for boreholes and water routing systems.
N2	Technical services engaged for the assembly, development and installation of boreholes and implements.
N3	Purchase or acquisition of 2 pieces of geoelectrical prospecting equipment with the relevant software and 2 mobile rotatory drillers, 1 with 30-m and 1 with 60-m drilling bars, and 20 manual 21-m subsurface drillers.
N4	Purchase of inputs and materials for the construction of roofs and cisterns and water routing systems.
N5	Technical services engaged for the assembly, development and installation of roofs and cisterns with water distribution system.
N6	No investment.
N7	Purchase of inputs and materials for the construction of community wells and water catchment systematization.
N8	Technical services engaged for soil systematization and design of the underground reservoir.
N9	Purchase or acquisition of two traction hydraulic backhoes with 3 cubic meters of capacity and 1 complete station with a geodesic GPS for planimetric and altimetric survey
N10	Purchase of inputs and materials for the construction of wells lined with casing and elements to build a drip irrigation system.
N11	Technical services engaged for the assembly, development and installation of a "spider legs" hole system.
N12	No investment.
N13	Hiring of experts for the performance of a pre-feasibility study of an insurance system.
N14	Cost of workshops and meetings with local and regional stakeholders. Collection and evaluation of available information.
N15	Cost of materials and inputs used during the performance of the feasibility studies.
N16	Cost of trips associated with the feasibility study of the project, field visits to assess production systems and collect information.
N17	Miscellaneous expenses associated with the performance of a feasibility study of climate risk transfer instruments.
N18	Hiring of an expert for the design of the insurance policy/creation of a contingency fund and follow-up.
N19	Costs of global multi-risk insurance premiums.
N20	Costs of the insurance contract or contributions to create a contingency fund for horticultural producers.
N21	Cost of workshops and meetings with local and regional stakeholders to design and monitor Pilot Plans.

N22	Cost of trips associated with the implementation and follow-up of Pilot Plans.
N23	Miscellaneous expenses associated with the implementation of Pilot Plans and Workshops, e.g., dissemination material.
N24	Hiring of experts to evaluate the outcome of the implementation of the Pilot Plans and make proposals and recommendations.
N25	Workshops and meetings with beneficiaries and local government representatives to assess the results of the Pilot Plans and analyze lessons learned.
N26	Cost of trips associated with the organization of final evaluation workshops.
N27	Purchase of inputs and materials for the orchard and fruit trees with fencing and irrigation elements.
N28	Technical services engaged for the assembly, development and installation of the system for breeding small animals and drip irrigation.
N29	No investment.
N30	Purchase of inputs and materials for management techniques of forage resources (seeds, bundling and conservation elements, etc.)
N31	Technical services engaged to build specific techniques for the use of this resource.
N32	No investment.
N33	Purchase of inputs, like seeds, to develop green manure techniques and materials for the implementation of contour ploughing.
N34	Engaging the services of a specialist in soil levelling techniques and contour ploughing.
N35	No investment.
N36	Purchase of inputs and elements for the installation of greenhouses and low protection systems.
N37	Technical services engaged for the assembly, development and installation of greenhouses.
N38	No investment.
N39	Purchases required for the incorporation of production infrastructure for small livestock adaptable to the area, like pens, fences, roofs, drinking and feeding troughs.
N40	Technical services engaged for the assembly, development and installation of pens, fences, roofs, etc.
N41	No investment.
N42	Consultant - Feasibility Studies and Electronic Engineering Support for the construction and development of Weather Stations pursuant to the Nimbus 2 a and b design.
N43	Hiring of 2 technical experts (holding a technical undergraduate degree) for 36 months for the assembly, development and installation, to be incorporated into the Institution.
N44	Survey of available stations, assessment of areas with deficiencies, network design, regional climate variability, workshop to assess measurement needs.
N45	Meteorological instruments of recognized quality for the assembly of 18 weather stations (15 fixed and 3 mobile) measuring at least 7 variables.
N46	Materials, electronic and electrical components for the assembly of 18 weather stations.
N47	Training workshop on the use and maintenance of automatic stations for local institutions (INTA and provincial government agencies).
N48	Cost of trips associated with the installation, adjustment and initial control of the stations and instruments.
N49	Highly Specialized Information Systems Services - Professionals from other institutions.
N50	Workshops and meetings required to reach agreements for the integration of the different existing networks.
N51	Data communication equipment for local rain gauging station networks and other stations, associated with servers or desktop equipment.
N52	Cost of trips associated with the assessment of needs and the supervision of server installation, and the installation of systems and software.
N53	Hiring of an IT professional for the development of subcomponents 2.1.4 and 2.1.5, with the commitment to continue working in the institution where the tasks will be developed (INTA).

N54	Servers, switches, Internet links, server OS and systems for integrating meteorological data from the different institutional networks in the area of intervention.
N55	Cost of trips associated with the installation of computer equipment, server systems and provision of Internet communication.
N56	Miscellaneous expenses and inputs associated with climate data entry and database design.
N57	International consultant in meteorological data interoperability, data integration and measurement networks. Visit to the project area, training workshop and 7 days of work (OMM / University to be defined).
N58	Cost of trips associated with standard interoperable formats, database communication.
N59	Local consultants for surveying available soil information and integrating and georeferencing basic mapping; soil sampling for updates; data entry of soil attributes in mapping units; consultants for surveying crop phenology information.
N60	Trips for collecting soil information and soil sampling.
N61	Materials for the physical and chemical analysis of soils and acquisition of a GPS to incorporate georeferenced data of small-scale producers.
N62	Local consultants for the installation and calibration of soil moisture sensors, and design of demonstration plots in crops and pastures.
N63	Cost of trips associated with the installation of sensors and measurement follow-up in demonstration plots.
N64	Cost of datalogger for data transmission and lab soil analysis of demonstration plots.
N65	Hiring of an expert in meteorology and a programmer to adapt the water balance software to the new crops of the region. Trainer in Quantum software.
N66	Workshops and meetings with representatives of local governments and producers' organizations to fine-tune the methodology used.
N67	Trips associated with workshops and meetings.
N68	Strengthening of the Agricultural Risk Office's capacities.
N69	Technical consultant hired for weekly-updating operating tasks.
N70	Meetings in the area of intervention to assess the results of the modelling and monitoring system.
N71	Trips associated with assessment meetings.
N72	Palisade software for risk analysis and Montecarlo-based simulation scenario.
N73	International consultant for training consultants of local institutions in the use of climate change scenario models.
N74	Local consultants to assess the impact of climate change scenarios on different production activities in the area of intervention.
N75	Dissemination and training workshops of technical experts of local governments.
N76	Trips associated with workshops and meetings.
N77	Local consultants to perform forecasts of flows, assess areas prone to flooding by means of models, satellite imagery and hydrological scenarios.
N78	Trips associated with the assessment of topography and flows.
N79	Acquisition of flow meters.
N80	Local consultants to apply seasonal forecast models adapted to the region and transfer to local stakeholders.
N81	Workshops and meetings to train local technical experts in the interpretation of seasonal forecasts and transfer in formats accessible to producers.
N82	Trips associated with the organization of workshops and meetings.
N83	International expert consultant for the design of the web platform of the Early Warning System.
N84	Expert consultants in: web design and IDE, programmers for database design, integration of all components in the EWS web site.
N85	Strengthening of local capacities, provision of computer equipment to local governments, INTA, ORA and producers' organizations for updating and consulting the EWS.

N86	Workshops and meetings to establish updating protocols of the EWS information, and mechanisms to disseminate and communicate such information to local producers.
N87	Workshops to integrate climate change adaptation into daily activities for a maximum of 20 multiplying agents of the different provinces where the project is being executed (technical experts and government representatives).
N88	Introduction of a rights approach into public policies: gender perspective and work with indigenous peoples. Printed dissemination material included.
N89	Workshop to analyze climate risks affecting specific productions of the region in each town.
N90	A 2-day course will be organized for technical experts and officials, and local workshops will be organized for producers. They will include a trainer, trips and printed material.
N91	Local workshops in the implementation areas of the insurance Pilot Plans. A workshop for government technical experts. Dissemination material included.
N92	The theory and practical training workshops will deal with: use of satellite images to determine places for drilling; the use of geoelectrical prospecting equipment; water potential study; analysis of chemical quality; assessment of water suitability for different uses, evaluation and determination of the most adequate drilling and pumping systems; use of the rotatory mechanical system to drill underground wells; equipment maintenance and conservation.
N93	The theory and practical workshops to be developed will deal with: retrofitting and waterproofing roofs; construction of dismountable roof structures; implementation of channelling systems by means of gutters, filters and reservoirs or cisterns; construction of underground and ground wells; installation of a pre-filtering and filtering system; water treatment; installation of extraction pumps; rights and obligations for water use by the community, and for system operation and maintenance; drafting of a regulation for the use of community systems.
N94	Theory and practical training workshops on: the use of open-air reservoirs; design and construction of community reservoirs; catchment, channelling and storage; use of a traction hydraulic backhoe; construction of sediment chambers; safety measures in the reservoir surroundings; equipment maintenance, planimetric and altimetric survey of inflow basins; complete station with geodesic GPS.
N95	Training workshops on the use of rainwater through the use of reservoirs; supplementary use of underground water; suitability limits for each use (human consumption, animal watering or irrigation); construction of wells lined with casing and “spider legs” hole systems; aspects to be taken into account about the use of water stored in reservoirs; ground systematization for rainwater catchment; installation and use of high-performance windmills; construction of sand filters; water treatment for human consumption, drip irrigation and animal watering; installation and appropriate use of drip irrigation systems.
N96	Workshops for training in sustainable resource management; strategies to raise awareness and improve knowledge of agroecological matters; gender and division of the household work into productive and reproductive tasks; techniques to enable intercultural knowledge transfer; efficient use of backyards; management of vegetable species and small farm animals; optimization of irrigation and of an efficient use of water; supply and availability of staple food for the family group; generation of marketable surplus.
N97	Training workshops on the management and use of forage resources to adapt to climate change; sustainable and profitable forest grazing systems; use of mega thermal forage species; management and combined association of species; use of multi-purpose species: tuna (*Opuntia ficus*) cultivation; creation of forage reserves: making straw bales, rolls and microsilage.
N98	Workshop on water erosion management; management techniques for flood-prone soils; contour ploughing; management of systematization equipment; use of cover crops and green manure.
N99	Workshops on technological measures to protect crops from temperatures: construction and use of macrotunnels for horticulture and floriculture crops; use of greenhouses to protect from late and early frosts; construction of shade-cloth structures for growing crops; implementation of irrigation systems.

N100	Training workshops on animal health care and welfare in areas likely to be affected by climate change phenomena: best practices for stock management; design, construction and accommodation of appropriate infrastructure for managing large and small livestock.
N101	Training workshop on the installation and maintenance of weather stations. Printed material included.
N102	Local workshops for producers and workshop for government technical experts.
N103	EWS dissemination strategies. They include the cost of designing advertising spots and of mass media dissemination, bulletins, a Manual.
N104	Participation of 4 specialists in one international professional development course or seminar.
N105	Contracts for external mid-term and final evaluations, review and systematization of lessons learned and best practices, and technical reports on specific topics related to the project.
N106	Contracts for project inception workshop.
N107	Travel costs for external mid-term and final evaluations.
N108	Publications - knowledge sharing and lessons learned activities.
N109	Project staff: a) Project coordinator: project planning, day-to-day project management, reporting, etc. 50% dedication; b) Financial Assistant: financial management, accounting, purchasing, and reporting, 50% dedication.
N110	Estimation of bank costs for transfer operations and other transaction costs.
N111	Miscellaneous expenses
N112	Amount added to allow for items, conditions, or events for which the state, occurrence, or effect is uncertain and that experience shows will likely result, in aggregate, in additional costs.

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

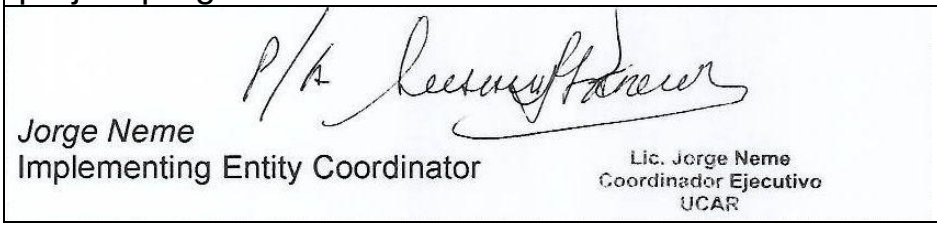
	Upon Agreement signature	One Year after Project Start[a/]	Year 2[b/]	**Total**
Scheduled Date		July 2014	July 2015	
Project Funds	2,285,672	1,996,791	1,339,038	5,640,000
Implementing Entity Fee	-	-	-	-
Total	**2,285,672**	**1,996,791**	**1,339,038**	**5,640,000**

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

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT[11] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Silvia Mucci, Externally Supported Programmes and Projects Advisor, Secretariat of Environment and Sustainable Development	Date*: February 04, 2013*

B. IMPLEMENTING ENTITY CERTIFICATION *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
 *Jorge Neme* Implementing Entity Coordinator

1. [6.] Each Party shall designate and communicate to the Secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Date: *February 04, 2013*	Tel. and email: 00 54 11 43 49 13 02, jneme@prosap.gov.ar
Project Contact Person: Mario Nanclares	
Tel. And Email: 00 54 11 43 49 46 59, mnanclares@prosap.gov.ar	

LIST OF ANNEXES

ANNEX A

a) Workshop in Resistencia, Chaco, 06 December 2012

Project
"Adaptive Capacity and Resilience of Family Agriculture of the North East of Argentina to the Effects of Climate Change and its Variability"

Overview and Goals

In Resistencia, on December 6, 2012, a workshop was hosted within the framework of the **"Adaptive Capacity and Resilience of Family Agriculture of the North East of Argentina (NEA) to the Effects of Climate Change and its Variability"** project.

The institutions organizing the workshop were the following:

- Argentine Secretariat of Environment and Sustainable Growth (Secretaría de Ambiente y Desarrollo Sustentable de la Nación - SAyDS)
- Agricultural Risk Office (Oficina de Riesgo Agropecuario - ORA)
- National Institute of Agricultural Technology (Instituto Nacional de Tecnología Agropecuaria - INTA)
- Unit for Rural Change (Unidad para el Cambio Rural - UCAR)

The workshop was organized with the following goal:
Jointly present and move forward with inputs for the formulation of the "Adaptive Capacity and Resilience of Family Agriculture of the North East of Argentina (NEA) to the Effects of Climate Change and its Variability" project.

In line with this goal, two results were sought:

1. The participants are familiar with the project.
2. The participants outlined actions for component 1 of the project.

Schedule of Activities and Overall Methodology

The methodology proposed for the workshop comprised different moments that included oral presentations, group dynamics techniques and full working sessions.
The workshop offered two general facilitators as well as theme leaders/facilitators primarily in charge of assisting the work developed in the theme tables.

The following schedule of activities was proposed to achieve the goal and the results set:

09:00 – 10:00 a.m.
Welcome, information about the day's activities and introduction of participants:

The workday started with the presentation of the workshop, its goals and results sought, and the proposed schedule of activities. All participants introduced themselves by stating their full name, their work place and the tasks performed by them.

10:00 – 11:00 a.m.
Project presentation. Time for questions.

This part was led by different representatives of the institutions participating in the project.

The main topics of this initial presentation were the following:

- Project formulation process. Adaptation Fund background.
- Presentation of the problem giving rise to the project: Climate trends and variability in the region.
- Already approved contents: General and specific goals, components, expected results and beneficiaries.

11:30 a.m. – 12:30 p.m.
Presentation of main topics addressed by component 1 of the project. Time for questions.

The goal of this section was to introduce the main topics of component 1 of the project: water, risk transfer and production management practices. The activity consisted in several presentations made by the theme leaders on the problems posed by Climate Change, some adaptation measures and their scope.

1:30 – 3:30 p.m.
Statement of actions. Group work.

By way of introduction of the statement of actions, a video was presented on the adaptive capacity to Climate Change: **Do we know enough about climate change?** **http://www.youtube.com/watch?v=gcq_hkrz6kE&feature=youtu.be**

Afterwards, a group activity was carried out aimed at outlining potential and feasible actions regarding each main topic of component 1, with their relevant group of beneficiaries and quantifications.

The work was performed on 3 tables: water, production management practices, and risk transfer. Each table was assisted by leaders that facilitated group exchange and the outlining of actions.

Water: Mario Basán, José García, Fortunato Martinez
Risk transfer: Sandra Occhiuzzi and Alma Isoldi
Production management practices: Pablo Walter and Diego Ramilo

Furthermore, 3 work groups were randomly formed that rotated around the tables so that all participants had the chance to contribute their own ideas on each topic.

Theme leaders were in charge of integrating all contributions into a specific datasheet.

The work was performed based on the following directives:

- What actions can you propose to help achieve the expected results and outcome of component 1?
- Who are the beneficiaries of these actions?

- Please try to quantify the proposed actions and beneficiaries.

By the end of the activity, the theme leaders/facilitators of the tables submitted the integrated contributions.

4:00 – 5:00 p.m.
Identification of capabilities to be strengthened. Full working session.

The purpose of this activity was to jointly think about the needs for capacity building in Climate Change adaptation.

The following questions were discussed in the full working session:
1. From your point of view, what capacities do we need to build on a technical level to adapt to the Climate Change, bearing in mind the topics addressed by the project?
2. From your point of view, what capacities are required at the family farmers' level?

The contributions made by the participants were collected on a poster.

5:00 p.m.
At the closing of the workshop, the following steps of the process so commenced were established, and it was agreed to send a workshop report by December 10. Also, it was jointly agreed to have the participants review all the actions proposed and capacities to be built and to provide an answer within a term of 7 days from the date the report is sent.

Results of the Workshop

Statement of Actions. Group work.

Datasheet of the Statement of Actions on the Water Topic:

Action	Group of Beneficiaries	Quantification
Community reservoirs (small and large livestock and vegetable irrigation) + cisterns for human consumption + drip irrigation systems + greenhouse films	Sáenz Peña Area and Consortia of the Province of Chaco. Province of Chaco (Gancedo, Pinedo)	
6 community reservoirs for animal consumption	Communities in Bermejo Department, Chaco	
Rainwater harvesting in cisterns + roofs in General San Martín Department: roadside dwellers + 2 community reservoirs for production + deepening of one reservoir	General San Martín Department	15 fixed underground cisterns made of ferro-cement and 115 above-ground cisterns made of ferro-cement or plastic. 1 community reservoir for 30 families in Campo Medina (indigenous) + community reservoir in Santa Rita + deepening of a reservoir in Laguna Loba Community
Supplementary irrigation with drilling and drip irrigation + water for families (underground source)	Southern Corrientes	300 already built, 1700 in total
Rainwater harvesting: cisterns and multipurpose community modules	Santiago del Estero	150 families for the cisterns + 5 multipurpose modules, El Desvío, Colonia 433, Sachayoj, Quimilí, Monte Quemado
Cisterns + reservoirs + wells lined with casing/drilling + drip irrigation systems + shade-cloth	Las Breñas (5 departments). Two groups were identified (General Pinedo and Las Breñas)	Agreement with Quilmes University. 50 to 60 families representing 10% of the population
Complete cisterns	Corrientes and Northeastern Chaco	
Drilling with windmills/pumps	Corrientes	

Action	Group of Beneficiaries	Quantification
(submersible, manual, rope pumps, etc.) + Australian tanks + distribution system + Assess the possibility of adding mobile drilling equipment		
Geoelectrical prospecting equipment for surveying underground water		
Supplement regional labs to monitor traces of agrichemicals	Inspect specific places for deficiencies and assess whether or not to take this action	
Surplus water	Identify places with risks and works to be performed in wetlands to analyze water management at a regional level (drainage channels with gates in Submeridional Lowlands and other areas). Management works in the case of extreme events	
Guarantee security systems of the works	Everywhere	
Induced recharge works of water-bearing sources for production purposes. Associated with agricultural practices in the western side, water for livestock in Tostado (collection, reservoir and distribution) and in El Nochero (water collection for consumption and irrigation of orchards) In the central region (Garabato), water collection for human consumption (cisterns) and reservoirs for small and large livestock At Las Toscas, with horticultural groups for irrigation and human consumption by means of drilling. Forest grazing management with water reservoir and water harvesting.	Northern Santa Fe, Santiago del Estero and Chaco	60 families
WATER USE EFFICIENCY * To be developed during the consultation process.	To be developed	--

Action	Group of Beneficiaries	Quantification
EQUIPMET (SHOVELS) * To be developed during the consultation process.	To be developed	--

Datasheet for the Statement of Actions on the Production Management Practices Topic:

Action	Group of Beneficiaries	Quantification
Crop diversification and association Cucurbits. Peri-urban	Vegetables for food safety in Fontana, Bilela	20 families
Implement forest grazing systems (goats, cattle).	Producers at El Desvío, Taboada Department, Santiago del Estero. Groups of producers at Las Toscas. Santa Fe Group of producers at Garabato. Santa Fe Group of producers at Tostado. Santa Fe. Group of producers in Bermejo, Libertad, General Donovan and San Fernando Departments. Santa Rita and Santos Lugares Community. Chaco	40 families. 40 families. 30 families. 30 families. 50 families. 30 families
Backyard orchards and vegetable gardens with irrigation and small animals.	San Martín Department (former roadside dwellers). Laguna Lobo Community (indigenous). Pampa del Indio. Campo Medina (indigenous).	15 families 45 families. 30 families.

Action	Group of Beneficiaries	Quantification
Soil management by means of contour plowing.	La Leona. Pinedo. Chaco	85 families
Multipurpose tuna management (fruit and forage).	Las Piedras, El Palmar de 12 de Octubre. Las Breñas. Chaco. Sachayoj, Santiago del Estero.	40 families.
Use of macrotunnels for horticultural and sweet potato crops.	Gancedo.	25 producers
Shade-cloth system (vegetables) with drip irrigation	Group of producers in Bermejo, Libertad, General Donovan and San Fernando Departments. Campo Toledo and Aspirante. Santiago del Estero. Las Piedras, El Palmar de 12 de Octubre. Las Breñas. Pinedo and Gancedo. Paralelo 28. San Fernando Department. Chaco Feriantes, San Martín Department Sáenz Peña	50 families 60 families. 20 families. 27 families. 20 families 30 families. 50 families
Indoor horti and floriculture (greenhouse).	Santa Fe (Las Toscas, Tostado, Garabato).	
Cotton cultivation in narrow furrows.	Los Juríes, Santiago del Estero.	50 families
Soil management with greenhouse films and green manure.	Goya, Lavalle and San Roque. San Cosme and San Luis del Palmar, Itatí.	100 families. 30 families

Action	Group of Beneficiaries	Quantification
Sub-superficial drip irrigation in extensive cultivation (for cotton and sugar canes)		10 families.
Biodigesters for greenhouse heating	Reconquista - Las Tocas	10 families
Fodder reserves and protein banks (machinery, mill, chopper)	Goya. Colonia Elisa, Colonias Unidas, Capitán Solari Tapenaga - Hermoso Campo San Cosme and San Luis	47 families. 40 families. 10 families. 15 families

Datasheet for the Statement of Actions on the Risk Transfer Topic:

Action	Group of Beneficiaries	Quantification
Alternative 1, damage compensation fund at the territorial level. For example, a Federation.	Small and diversified, it is a production system.	
Traditional multi-risk insurance For example, global multi-risk, covering investment costs.	Fairly capitalized / commodities into the market.	For example, Las Breñas or a western district of Chaco and Santiago del Estero, eastern Santa Fe. 500 producers, 150,000 hectares General San Martín Department
Feasibility study of coverage for multi-product producers and/or livestock index. Rural safety net		300 families / 9 organizations in San Martín Department
Hail, alternation between hot and cold climates, drought, surplus water, solar radiation. It could be a damage compensation fund. Plus training. Training. Participatory processes. Proposal to consult organizations.	Cucurbits such as squash, melon and watermelon are grouped into an association Leafy vegetables, Corrientes green belt with irrigation – tornado and hail risk. Indoor horticulturists.	60 producers in Juan José Castelli, General Guemes Department / in San Martín Department there would be 40 other producers/ in Saladas Department, Corrientes, there are also cucurbits and 3 organizations (200 families), in San Roque Department, there are 120 other families.
Training, clearly explain the policy issue.		

Identification of capabilities to be strengthened. Full working session.

At the technical expert level:
From your point of view, what capacities do we need to build on a technical level to adapt to the Climate Change, bearing in mind the topics addressed by the project?

- Installed capacity in the water dilemma
- Training in irrigation
- Training in another more eco-friendly production model: Agroecology
- Knowledge of the Water Code
- Knowledge of trusted institutional and private labs (quality and costs)
- Water sampling and analysis
- Social and organizational capacity, and its scope
- Risk and insurance
- General Climate Change awareness and future trends
- Satellite image reading
- Soil management and conservation: contour plowing, agro-hydrological modeling

Within this context, a comprehensive seminar on water management was offered (7 modules of 8 to 18 months), and taught at IPAF NOA with an excellent outcome.

At the producers' level:
From your point of view, what capacities are required at the family farmers' level?

- Training in the water issue, its use, management, maintenance with the supply of machinery and the use of related tooling.
- Training in the water code.
- Training in water sampling and analysis
- Knowledge and training in risks: policies, coverage, insurance, etc. (Workshop design as per insurance scheme).
- Climate Change and trends
- Training in another more eco-friendly production model: Agroecology

Workshop Participants

	Full Name	Place	Task Performed	E-mail
1	Flavia Francescutti	Basail – Chaco	In charge of AER Basail	ffrancescutti@correo.inta.gov.ar
2	Daniel Prieto	EEA Santiago del Estero	Coordinator of PPR Agua	dprieto@santiago.inta.gov.ar
3	Mario Basan Nickisch	EEA Reconquista	*Manejos del agua* Special Project Coordinator for AF	mbasan@correo.**inta**.gov.ar basannickisch@mario@inta.gob.ar
4	Mariano Lestani	EEA Colonia Benitez	Rural Development Coordinator	lestani.mariano@inta.gob.ar
5	Mario Pedro Lenscak	EEA Bella Vista	EEA Director	mlenscak@correo.inta.gov.ar
6	Gabriel Tortarolo	EEA Colonia Benitez	EEA Director	tortarolo@correo.inta.gov.ar
7	Fortunato Martinez	IPAF NEA	Professional for AF and Agua	fortunatomartinez@correo.inta.gov.ar
8	José Benjamín Leiva	SSAF Corrientes	Provincial Representative for SSAF Corrientes	ssdryafcts@gmail.com
9	Roque Miranda	SSAF Corrientes	Provincial Leader	R_miranda@arnet.com.ar
10	José Luis Russo	CR Corrientes	Regional Director	jrusso@correo.inta.gov.ar
11	Howard van Meer	EEA Santiago del Estero	Climate and Water Professional	hvanmeer@santiago.inta.gov.ar
12	Rosalino Ortiz	EEA Saenz Peña	PRET Coordinator	rortiz@chaco.inta.gov.ar
13	Oscar Raúl Palaoro	EEA El Colorado	Rural Development Coordinator	opalaoro@correo.inta.gov.ar
14	Hector Ferrario	CR Chaco-Formosa	Extension worker	intaelzapallar@yahoo.com.ar
15	Gabriel Lacelli	EEA Reconquista	EEA Director	lacelli.gabriel@inta.gov.ar
16	Osvaldo Fusari	Santa Fe Regional Center	AREx and Planning Assistant	fusari.osvaldo@inta.gov.ar
17	Luciano Sanchez	EEA Reconquista	Extension Researcher	lsanchez@correo.inta.gov.ar
18	Mabel Amarilla	EEA Santiago del Estero	Water Resource Extension Researcher	mamarilla@santiago.inta.gov.ar
19	Pablo Walter	CNTyE Buenos Aires	NEA ProFeder Leader	pwalter@correo.inta.gov.ar walter.pablo@inta.gov.ar
20	José García	IPAF NOA	Water Professional	garcia.josé@inta.gob.ar
21	Gustavo Coronel	EEA Santiago del Estero	Regional Project Coordinator	gcoronel@santiago.inta.gov.ar
22	Rodolfo Acosta	SSAF Chaco	SSAF Chaco Leader	rodacosta2003@yahoo.com.ar
23	José Rafart	EEA Las Breñas	EEA Director	jrafart@correo.inta.gov.ar
24	David Arias Paz	EEA Santiago del Estero	Provincial Coordinator for ProHuerta	ariaspaz.angel@inta.gob.ar
25	Sandro Sassatelli	MAGyP Buenos Aires	SSDGR Familiar Project Director	ssassa@minagri.gov.ar
26	Omar G. Loto	EEA Las Breñas	PRET Coordinator	oloto@correo.inta.gov.ar

27	Etelvina Gesualdo	AER General Pinedo / EEA Las Breñas	In charge of AER	gesualdo@correo.inta.gov.ar
28	Diego Ramilo	CNTyE Buenos Aires	National Coordinator for ProFeder	dramilo@correo.inta.gov.ar
29	Eduardo Delssín	CR Chaco-Formosa	Regional Director	edelssin@correo.inta.gov.ar
30	Alma Isoldi	Risk Office, ORA Buenos Aires	Insurance Area Professional	aisold@minagri.gob.ar
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33	Juan Sablich	AER Goya	Extension Worker	juansablich@gmail.com sablich.juan@inta.gov.ar
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40	Javier Muchirt	SSAF Chaco	SSAF Production – Livestock Leader	javiermuchirt@hotmail.com
41	Pablo Mercuri	Climate and Water Institute, Castelar	Institute Director	pmercuri@correo.inta.gov.ar mercuri.pablo@inta.gob.ar
42	Mario Nanclares	UCAR Buenos Aires	Professional	mnanclares@prosap.gov.ar
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ANNEX A

b) Consultation Meeting in Pampa del Indio, Chaco, 10 January 2013

"Adaptation and resilience of family agriculture in Argentina's northeast before impacts deriving from climate change and its variability" Project

Consultation meeting

January 10th, 2013, Pampa del Indio, Province of Chaco

At the meeting the project's idea, the execution structure, and its components were introduced, making sure everyone knew that the project is pending approval. Subsequently, the activities proposed for component 1 were presented in more detail, to be executed by INTA [National Institute for Agricultural Technology] and next, specific works for the area of Pampa del Indio were introduced. The participants agreed that water supply is a top priority for local communities, and only after solving such priority can any more thoughts be given to production. The project's general idea was accepted, and it was agreed that the technical proposal of dams and reservoirs is the more feasible proposal for the area. Afterwards, leaders and representatives of the communities made a series of questions, requests, and recommendations, summarized below, which will be taken into account upon project's drafting:

- Information was requested on the rationale behind the definition and prioritization of areas for implementing dams. INTA's representatives attending the meeting replied that, even though the final proposal and definition depend on the target communities' opinion, the preliminary ideas submitted followed criteria of areas with more needs in terms of water supply, areas with more population, and areas falling outside the trace of other works planned for the region.

- It was requested that participation of the communities and their leaders be ensured at the time of defining works' priorities and the specific locations of each work and the techniques to be used to execute such works.

- Under the project's actions, training for young people of the communities regarding application of technology and specific techniques for water supply, was a request made, so that communities can achieve self-sufficiency. Furthermore, it was requested that the costs should include all such tools necessary for maintenance tasks. These suggestions are based on the lessons learned from previous projects. There are functional mills out of service resulting from the lack of local capacity in maintenance.

- The difficulty of obtaining fresh water in the area was raised as an issue, and consequently the performance of a comprehensive technical survey was requested to be conducted accommodating local knowledge.

- As regards the execution of sub-projects, the cost of overhead expenses necessary for execution which the communities cannot afford (for example, fuel expenses) is identified as a problematic issue.

- A request was made that members of the communities should participate in work teams under each sub-project.

- The question was raised of whether community labor will be funded and remunerated with the funds provided for each sub-project or whether this cost will be covered with matching funds.

List of participants:

Name	**Area / Organization**
Santos Lopez	Campo Medina
Luis Benega	La Laguna
Herminio Mendez	Cuarta Legua
Merciade Mancilla	*Consorcio Rural Indígena* [Board of Rural Indigenous Population]
Atanasio Sanchez	Pueblo Viejo
Tomás Napoleón	Campo Medio
Bernardo Gomez	Lot 4
Oscar Palaoro	EEA El Colorado [agricultural experimental station] – INTA [National Institute for Agricultural Technology]
Ricardo Ferrara	SsAF [Under-Secretariat of Family Agriculture]– MINAGRI [Nat.Ministry of Agriculture, Farming and Fishing]
Fernando Toth	UCAR – MINAGRI
Adrian Martin	ODR Pampa del Indio - INTA
Edgardo Alvarez	Agreement INTA – INAI – IDACH [Chaco's Institute of Indigenous Affairs]

ANNEX B: Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework

Project Objective	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
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	Number of Families vulnerable to the adverse effects of climate variability and change	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	Output 2.2: Number of people with reduced risk to extreme weather events	5.640.00
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	Grant Amount (USD)
1.1. Improvements in the use and productivity of water for family agricultural producers	% of producers with enhanced capacities to respond to climate change and variability	Output 2.2: Targeted population groups covered by adequate risk reduction system	2.2.2 Percentage of population covered by adequate risk-reduction systems	1.428.171
1.2 Reducing the variability in income inflow of family agricultural producers, promoting their continuity in the activity and in rural settings	% of targeted population covered by adequate risk-transfer mechanisms (disaggregated by gender)	Output 2.2: Targeted population groups covered by adequate risk reduction systems	2.2.1: Percentage of population covered by adequate risk-reduction systems	1.250.142
1.3. Increase in agricultural production of small-scale family producers and reduction of economic and social vulnerability in the face of climate change and variability	Number of small-scale family producers having more secure (increased) access to livelihood assets	Output 6.1: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1: No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies	645.868
2.1. improvement and enhancement of the capacity of monitoring and evaluating	Density increase of hydrometeorological stations and pluviometers	Output 4: Vulnerable physical, natural, and social assets strengthened	4.1.2 No. of physical assets strengthened or constructed to withstand conditions	653.500

climate change and variability		in response to climate change impacts, including variability	resulting from climate variability and change (by asset types)	
2.2. Systematized and freely available basic information for effective decision making regarding adaptation of producers to adverse conditions, and for local and regional planning	Number of staff members, decision makers and producers using early warning system and climatic knowledge platform as basis for decision taking	Output 1: Risk and vulnerability assessments conducted and updated at a national level	1.2 Development of early warning systems	750.870
3. Municipal and provincial governmental units, educational settings, and producers with capabilities to generate appropriate adaptive interventions	% of staff and producers capacitated who implements measures to respond to, and mitigate impacts of, climate-related events (disaggregated by gender)	Output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	2.1.1 No. of staff trained to respond to, and mitigate impacts of, climate-related events	434.700

ANNEX C: Letters of Support

Ministerio de Agricultura, Ganadería y Pesca
Unidad para el Cambio Rural

Buenos Aires,
Letter UCAR Nº

Adaptation Fund Board
1818 H Street, NW MSN P4-400
Washington, DC 20433 USA

Dear Sir/Madam,

In its capacity as Argentina's National Implementation Entity, the Unit for Rural Change (UCAR) submits for consideration to the Adaptation Fund the project "Family farming in Northeast Argentina (NEA) adaptation and resilience to the impact of climate change and its variability".

This project is amongst National Government's top priorities when it comes to implementing adaptation activities to reduce adverse impacts and risks brought about by climate change and its variability in Northeast Argentina, which affects mostly small-farmers.

We would like to stress the fact that given the commitment of Argentina's government with the purposes described in the project, the UCAR has resolved to contribute a substantial portion of their technical staff and material resources necessary to support its implementation. This will allow to strongly reduce costs related to the project's performance and supervision, and also to widen the number of beneficiaries and the scope of planned activities.

We strongly believe that this initiative will enhance progress in the adaptation and sustainable development processes of one of the most vulnerable regions in our country, offering small farmers the necessary means and tools to face the challenges brought about by climate change.

Please, do not hesitate to contact us for any further information.

Yours sincerely,

SUSANA MARQUEZ
Relaciones Institucionales
UCAR

Ing. RAUL A. CASTELLINI
AREA GESTION PROYECTOS PUBLICOS
PROSAP

p/a
Ing. JORGE NEME
COORDINADOR EJECUTIVO
UCAR
DISPOSICION 25/2012

Ministerio de Agricultura, Ganadería y Pesca
Unidad para el Cambio Rural

BUENOS AIRES,
NOTA UCAR Nº

Ref.: Proyecto "Adaptación y Resiliencia de la agricultura familiar del NEA"

SEÑOR SECRETARIO:

Tenemos el agrado de dirigirnos a usted con relación al Fondo de Adaptación del Protocolo de Kyoto, a efectos de elevarle para su consideración y endoso el documento del Proyecto Nacional "Adaptación y Resiliencia de la agricultura familiar del noreste de Argentina (NEA) ante el impacto del cambio climático y su variabilidad".

El proyecto tiene por objetivo implementar actividades que aumenten la capacidad adaptativa de los pequeños productores agrícolas familiares del NEA frente a los impactos adversos producidos por el cambio climático y la variabilidad, como inundaciones y sequías, y fortalecer las capacidades de los organismos nacionales y regionales en la materia.

Dicho proyecto está en conformidad con las prioridades del Gobierno Nacional en materia de adaptación, establecidas en la Estrategia Nacional de Cambio Climático, y responde a los lineamientos de la nota conceptual ya aprobada por el Board del Fondo de Adaptación en su 18° reunión de junio pasado.

Por último, cabe señalar que el proyecto será ejecutado por el Ministerio de Agricultura, Ganadería y Pesca, el Instituto Nacional de Tecnología Agropecuaria y la Secretaría de Ambiente y Desarrollo Sustentable de la Nación, y su implementación será supervisada por esta Unidad en su carácter de Entidad Nacional de Implementación de proyectos para el Fondo de Adaptación. Para su formulación, se conformó un Comité Técnico integrado por un representante de cada uno de los organismos mencionados.

Agradeciendo su gestión para el endoso de esta propuesta al Fondo de Adaptación, saludamos a usted con nuestra mejor consideración.

Adj.: Documento de proyecto

SUSANA MARQUEZ
Relaciones Institucionales
UCAR

Ing. RAUL A. CASTELLINI
AREA GESTION PROYECTOS PUBLICOS
PROSAP

AL SEÑOR
SECRETARIO DE AMBIENTE Y DESARROLLO
SUSTENTABLE DE LA NACIÓN
DR. JUAN JOSÉ MUSSI
S. / D

Ministerio de Agricultura, Ganadería y Pesca
Instituto Nacional de Tecnología Agropecuaria
Presidente

Buenos Aires, 02 ENE 2013

Note P Nº 013 /2013

Adaptation Fund
c/o Adaptation Fund Secretariat
secretariat@adaptation-fund.org

Dear Sirs,

We wish to inform you that the Instituto Nacional de Tecnología Agropecuaria (INTA) hereby confirms its interest in and commitment to participating in the project in question submitted by Argentina to the United Nations Framework Convention on Climate Change Adaptation Fund through INTA's National Implementation Entity, Unit for Rural Change (*UCAR, Unidad para el Cambio Rural*).

Within the framework of this initiative, INTA is committed to providing the necessary resources to support the implementation of the project aiming at reducing the vulnerability and increasing the resilience of rural communities against the impacts and variability of climate change in northeastern Argentina. For this purpose, INTA will use the institutional capacities available to it at the four relevant provinces.

This iniciative will allow us to make progress in the process of adaptation and sustainable development of one of the areas of greater vulnerability in Argentina, and to bring the necessary means and tools closer to the small-scale rural producers to fight the challenges created by climate change.

Therefore, our Institution will contribute with both technical staff and supplies to meet the objectives set for the project, and will thus maximize the use of the resources provided by the Adaptation Fund.

Looking forward to a lasting and fruitful collaboration within this project.

Yours sincerely,

Ing. Agr. Carlos Horacio CASAMIQUELA
Presidente

Ministerio de Agricultura, Ganadería y Pesca
Secretaría de Agricultura, Ganadería y Pesca

NOTA SAGyP Nº 34-

Buenos Aires, 26 ENE 2013

Adaptation Fund
c/o Adaptation Fund Secretariat
secretariat@adaptation-fund.org

Dear Sirs,

We whish to inform you taht the Ministerio de Agricultura, Ganadería y Pesca (MAGyP) hereby confirms its interest and commitment to participating in the Project in question submitted by Argentina to the United Nations Framework Convention on Climate Change Adaptation Fund through National Implementation Entity, Unidad para el Cambio Rural (UCAR).

Within the framework of this initiative, MAGyP is committed to providing the necessary resources to support the implementation of the Project aiming to reduce the vulnerability and increasing the resilience of rural communities against the impacts and variability of climate change in northeasterns Argentina. For this purpose, MAGyP will use the institutional capacities available at the four relevant provinces.

This iniciative will allow us to make progress in the adaptation process and sustainable development of one of the regions of greater vulnerability in Argentina, and to bring the necessary means and tools closer to the small-scale rural producers to fight the challenges created by climate change.

Therefore, our Institution will contribute with both technical staff and supplies to reach the objetives set for the proyect, and will thus miximize the use of the resources provided by the Adaptation Fund.

Looking forward to long lasting and fruitful collaboration within this Project.

Yours sincerely,

Ing. Agr. Lorenzo R. Basso
Secretario de Agricultura, Ganadería y Pesca

ANNEX D: List of Acronyms

AF	Adaptation Fund
APA	Provincial Water Administration
AVHRR	Advanced Very High Resolution Radiometer
CFA	Federal Agricultural Council
CFACyT	Federal Advisory Council on Science and Technology
CFDSEyS	Federal Council for Economic and Social Development
CFSP	Federal Council of the Productive System
CIMA - UBA	Research Centre of the Seas and the Atmosphere of the University of Buenos Aires
CLIVAR	Climate Variability and Predictability project
COFEMA	Federal Environmental Council
CONICET	National Council for Research on Science and Technology
DCC	Climate Change Office (under Secretariat for Environment and Sustainable Development)
EAP	Agricultural production unit
ECLAC	Economic Commission for Latin America and the Caribbean
ECPI	Indigenous Community Supplementary Survey
EEA	Agricultural Experimental Station
EHDI	Extended Human Development Index
ENSO	El Niño-Southern Oscillation
EWS	Early Warning System
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GIS	Geographic Information System
GoA	Government of Argentina
GPS	Global Positioning System
Ha	Hectare
ICAA	Corrientes' Institute of Water and the Environment
IDACH	Chaco's Institute of Indigenous Affairs
IFAD	International Fund for Agricultural Development
IICA	Interamerican Institute for the Cooperation in Agriculture (within Organization of American States)
INA	National Water Institute
INAI	National Institute for Indigenous Affairs
INDEC	National Institute of Statistics and Census of Argentina
INTA	National Institute for Agriculture Technology
INTI	National Institute of Industrial Technology
IPAF	Institute of Technological Research and Development for Small-scale Family Agriculture
IPCC	Intergovernmental Panel on Climate Change
LAC	Latin America and the Caribbean
LAI	Leaf Area Index

M&E	Monitoring and Evaluation
NAF	Small-scale Agricultural Producer Groups
MAGyP	Ministry of Agriculture, Farming and Fishing
NDVI	Normalized Difference Vegetation Index
NEA	Northeast region of Argentina
NOAA	National Oceanic and Atmospheric Administration
NSCC	National Strategy on Climate Change
ORA	Agricultural Risk Office (under Ministry of Agriculture, Farming and Fishing)
PEA	Agri-Food and Agro-industrial Participatory and Federal Strategic Plan 2010-2020
PRODERNOA	Rural Development Project in North-western Argentina
PRODEAR	Rural Areas Development Program
PRODERPA	Rural Development Project of Patagonia
PROINDER	Project for the Development of small-scale agricultural producers (under Ministry of Agriculture, Farming and Fishing)
PROSAP	Provincial Agricultural Service Programme
ReNAF	National Registry of Small-scale Agricultural Producers (within the Ministry of Agriculture, Farming and Fishing)
SAyDS	Secretariat for Environment and Sustainable Development
SENASA	Agri-food Health and Quality National Service
SMN	National Meteorological Service
SNC	Second National Communication of the Republic of Argentina to the United Nations Framework Convention on Climate Change
SsAFyDr	Under-secretariat of Small-scale Agricultural Producers and Rural Development
UBA	University of Buenos Aires
UBN	Unsatisfied Basic Needs
UCAR	Unit for Rural Change (under Ministry of Agriculture, Farming and Fishing)
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UTN	National Technological University
VAT	Value added tax
WMO	World Meteorological Organization

ANNEX E: Endorsement Letter by Government

"2013 - Año del Bicentenario de la Asamblea General Constituyente de 1813"

Jefatura de Gabinete de Ministros
Secretaría de Ambiente y Desarrollo Sustentable

Buenos Aires, 04 FEB 2013
Nota N° 13/2013

Subject: Endorsement of the Project "Enhancing the Adaptive Capacity and Increasing Resilience of Small-size Agriculture Producers of the Northeast of Argentina"

To:
The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat

Dear Sir/Madam,

In my capacity as the Argentinean Designated National Authority for the Adaptation Fund, I hereby confirm that the attached national project proposal is in accordance with the government's national and provincials priorities in implementing adaptation activities to reduce the adverse impacts of, and risks, posed by climate change and its variability in the Northeast of Argentina.

ARIEL CLAUDIO LOPEZ

Accordingly, I am pleased to endorse the attached project proposal for support by the Adaptation Fund. If approved, the proposal will be implemented by the National Implementing Entity Unit for Rural Change (UCAR) and executed by the Ministry of Agriculture, Livestock and Fishery, the National Institute of Agriculture Technology, and the National Secretariat of Environment and Sustainable Development.

Sincerely,

Lic. Silvia Mucci
National Designated Authority for the Adaptation Fund
Externally Supported Programmes and Projects Coordinator
National Secretariat of Environment and Sustainable Development