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

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-SIZE AGRICULTURE PRODUCERS OF THE NORTHEAST OF ARGENTINA**
TYPE OF IMPLEMENTING ENTITY: **NATIONAL IMPLEMENTING ENTITY**
IMPLEMENTING ENTITY: **UNIDAD PARA EL CAMBIO RURAL (UCAR - UNIT OF RURAL CHANGE)**
EXECUTING ENTITY/IES: **MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERY; NATIONAL INSTITUTE OF AGRICULTURE TECHNOLOGY, AND; NATIONAL SECRETARIAT OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**
AMOUNT OF FINANCING REQUESTED: **5.600.000** (In U.S Dollars Equivalent)

PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

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

Introduction

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

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

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

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

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

Characterization of Northeastern Argentina

Argentina's northeast comprises a surface area of 338,679 Km2 (12.1% of Argentina's continental surface area) and, from an environmental viewpoint, is widely diverse. The provinces of Formosa, Chaco and the east of the province of Corrientes comprise the eco-region of *Gran Chaco*, a vast sedimentary plain, extremely flat, shaped by the action of rivers cutting through its surface ground following a northwest-southeast direction, to wit rivers Juramento-Salado, Bermejo, Pilcomayo and 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 Misiones province the *Selva Paranaense* prevails, which is a tropical rainforest with very high biodiversity with areas relatively flat and thick soil (in the proximity of the Parana river and other main rivers) and a relatively flat plateau with elevations of 550 to 800 m above sea level. Climate is of the subtropical kind, with annual precipitation ranging between 1,000 and 2,200 mm.

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

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

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

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

Population and activity of Northeastern Argentina

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

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

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

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

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

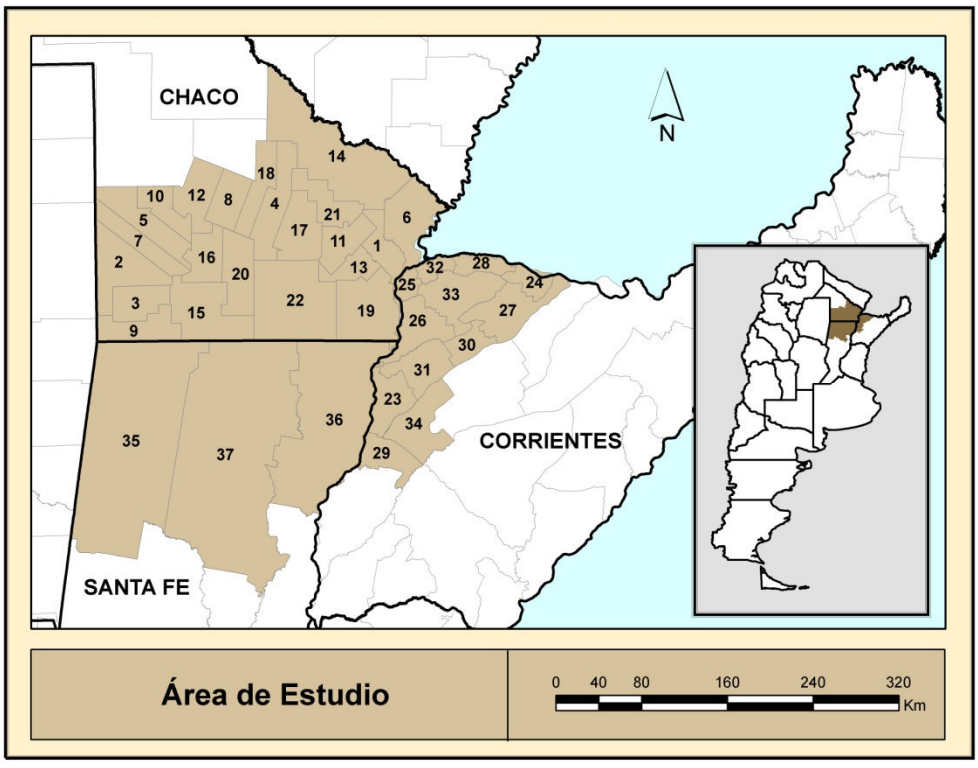
NEA's social indicators summed up

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

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

Social and production profile of the Beneficiaries

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



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

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

According to Scheinkerman de Obschatko (2009:10-19), a family-based agricultural production unit (or family EAP in Spanish) means those places where direct work of the

producer and the existence of family work can be verified but it can also extend to include the possibility of hiring up to two remunerated workers on a permanent basis.

The 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 47.6% (O´Higgins, Chaco), thereby reflecting a clear homogeneity in terms of social vulnerability indicators.

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

The variations between Chaco and Santa Fe in terms of production used to be mainly related to different emphasis placed on productivity and on orientations within such sector. However, a succession of **production crisis and transformations** have 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.

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%.**

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

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

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

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

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

Climate and seasonal variability

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

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

SUMMER PRECIPITATION (DECEMBER – JANUARY – FEBRUARY)[2]

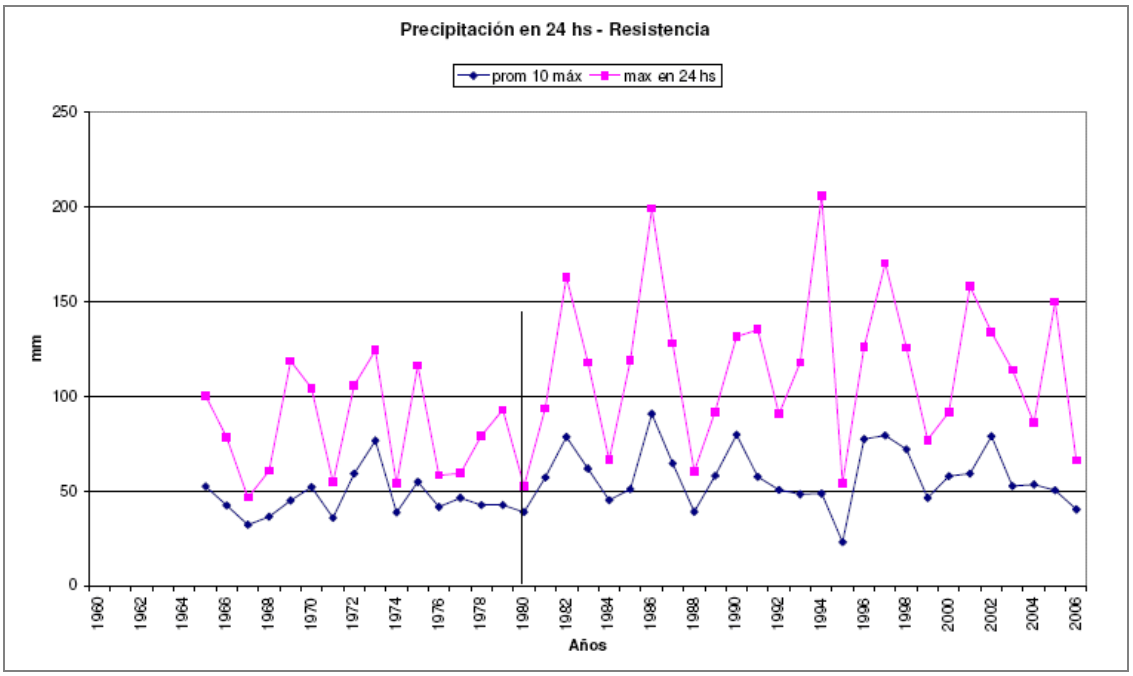
[2] The data with which calculations were performed were provided by the National Meteorological Office (SMN).

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

Changes observed at a local scale

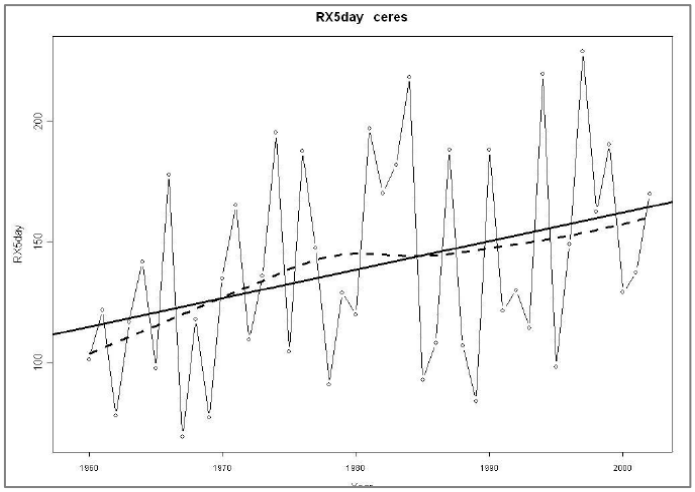
Precipitation

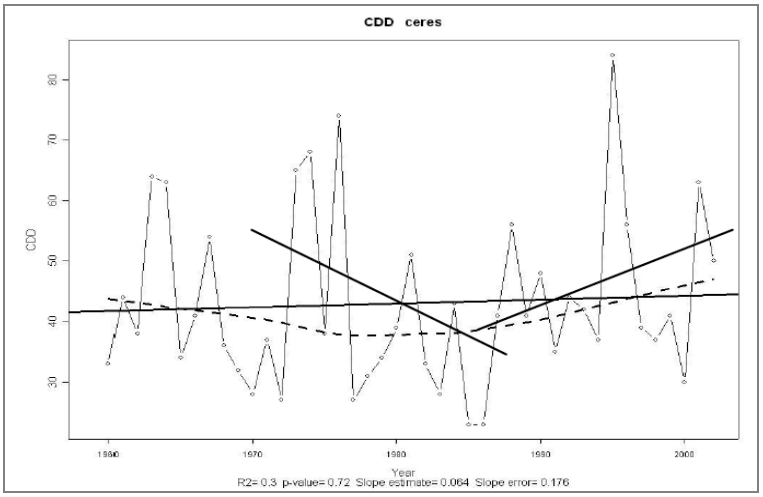
There is evidence to the fact that storms - though increasingly lesser in terms of spatial coverage - have been more intense locally over the last years. The following graph (Marino 2007) shows the increase recorded in Resistencia (Chaco) in the maximum amount of rainfall for 24 hours recorded each year.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



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

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





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

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

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

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

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

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

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

Temperature

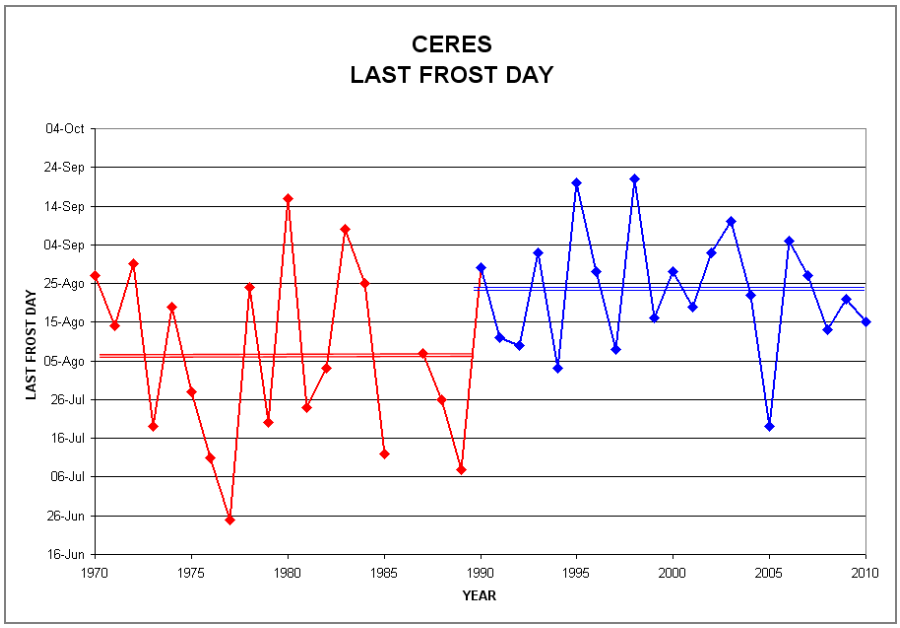
As regards mean annual temperature, no homogeneous pattern can be pinpointed as it was the case with precipitation, although the tendency has been positive, particularly after 1970-1971. A regional increase has also been found in mean minimum and maximum temperatures since 1930. It is worth mentioning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

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

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

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

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



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

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

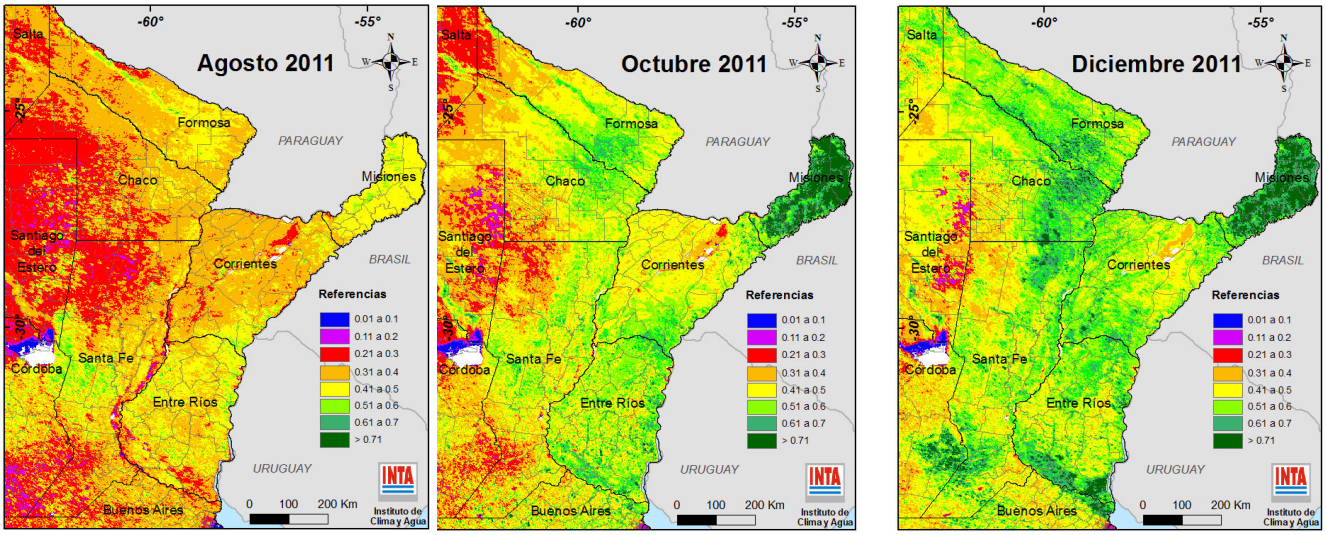
Not only are heat waves highly related to human and animal mortality, but its negative influence has also been studied upon agricultural and farming productivity.

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

Vegetation Index

Remote sensing technology can be used to characterize the seasonal and inter-annual dynamics of vegetation communities. Time series analysis of the National Oceanic and Atmospheric Administration's (NOAA) Advanced Very High Resolution Radiometer (AVHRR) 1-km multispectral imagery have shown changes in seasonally-dependent biophysical variables such as leaf area index (LAI), biomass, and net primary

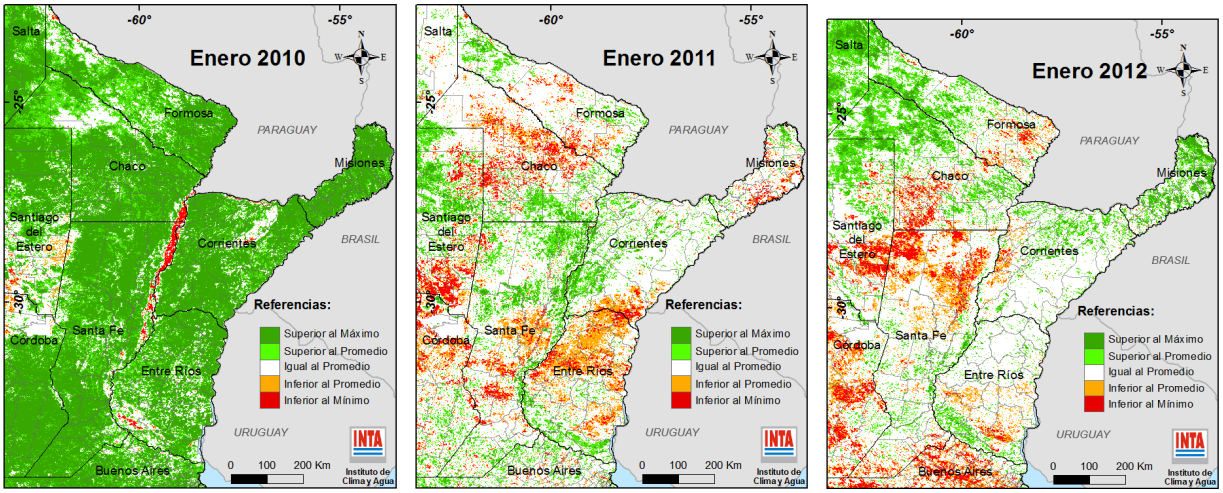
productivity. Time-integrated normalized difference vegetation index (NDVI) data revealed that spatial and temporal variability during the growing season is correlated with precipitation and other variables that are important controls on pastures, grassland and crops performance and productivity in the area of interest. This analysis is supported by several research studies that concluded that NDVI is strongly related to precipitation.



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

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

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

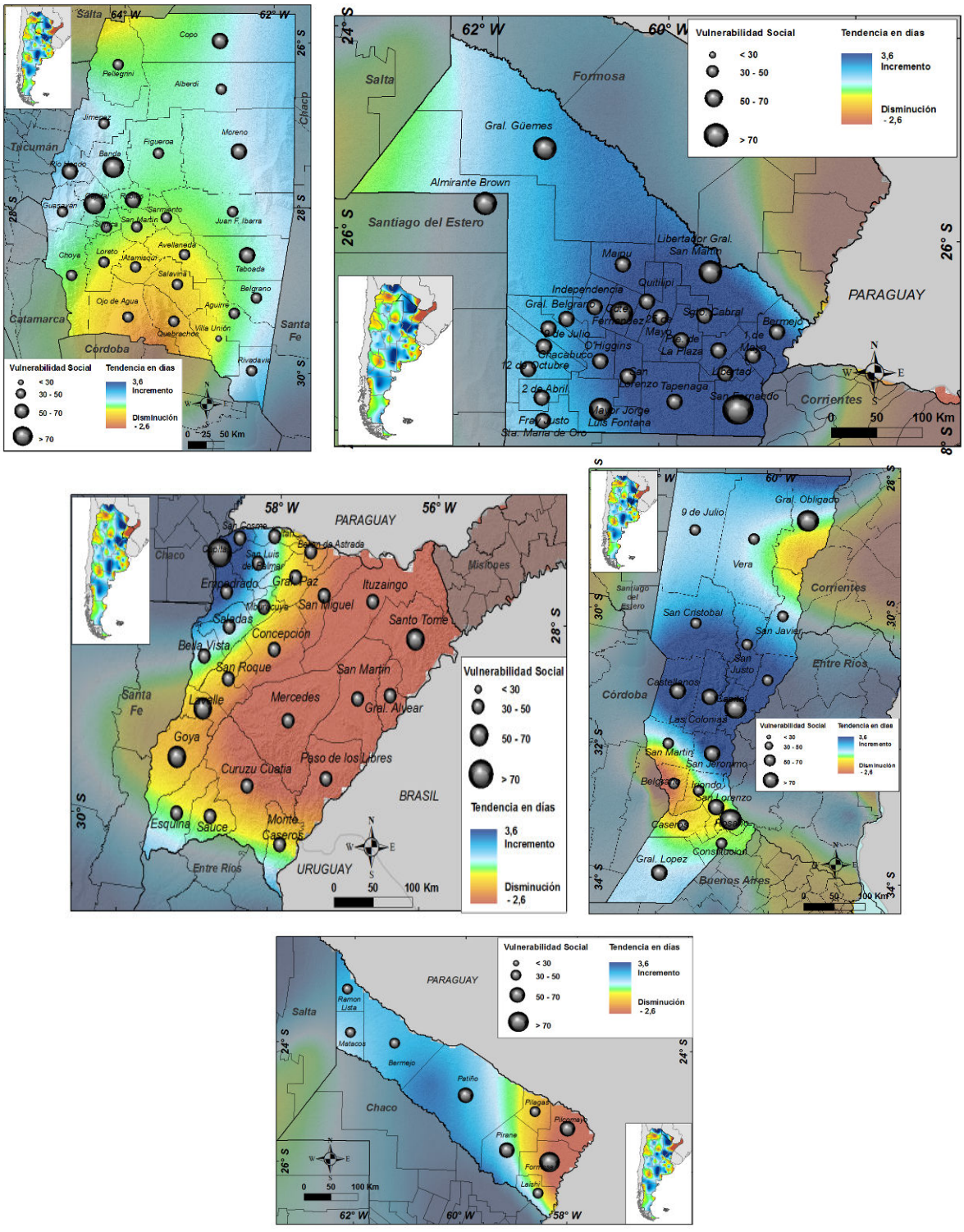


INTA Climate and Water Institute (2012), Comparative NDVI of the last three year during January, summer season, as a demonstration of the climate variability and change of this area during recent years.

Combined vulnerability

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

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

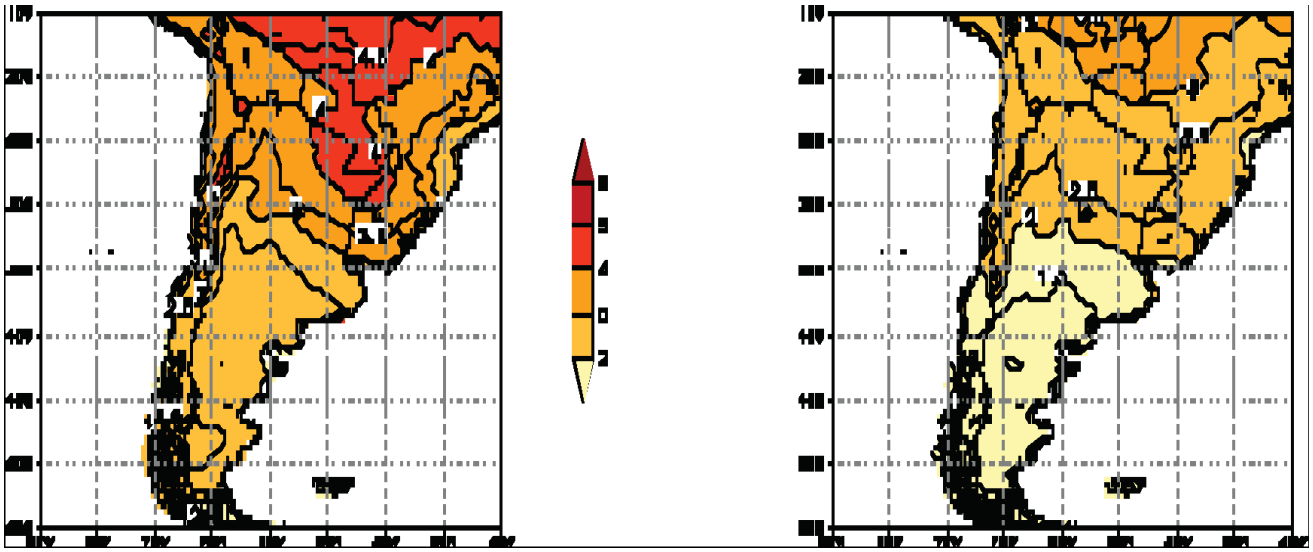


INTA & DCC SAyDS (2012), Combined analysis of social indicators (circles meaning social vulnerability of the district), superimposed on the colored maps related to very humid days (trend in precipitations above the 95% percentile) meaning the blue areas an increase in the very humid days.

Projected climate changes

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

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



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

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

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

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

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

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

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

eastern half of Chaco and the north and northeast of Santa Fe. The rest of the region would experience an increase that would reach 100 mm in the south of Santa Fe and a little bit over 120 mm in the east of Misiones.

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

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

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

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

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

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

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

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

It is worth mentioning that the agricultural expansion brought about a dramatic reduction of natural coverage over the last century. The most critical case is that of the Atlantic

Forest, which ecosystem has gone down from 85% to 5% in the state of Parana (Brazil). Soils in the Del Plata basin converted to agriculture feature compaction and water erosion processes. As a result, surface run-off towards receiving bodies of water and peak discharge has grown and sped-up, with a reduction of time of concentration. Changes in land uses, among many other factors, will contribute to an increase in the flooding risk, both fluvial and pluvial in origin.

PROJECT / PROGRAMME OBJECTIVES:

List the main objectives of the project/programme.

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

The specific objectives of the project are:

1. To enhance the resilience of small-scale agricultural producers from the Northeast in light of climate change and variability.
2. To strengthen hydrometeorological and agro-production monitoring systems to improve the institutional capacity of assessing, and planning for, climate change impacts in the agricultural subsistence systems.
3. To enhance institutional capacity, both at national and provincial/local level, for decision making and management of the implementation of adaptation meaures and actions to address climate change and variability in northern Argentina.

PROJECT / PROGRAMME COMPONENTS AND FINANCING:

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

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

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US$)
1. Improvement of the capacity of adaptation to climate change and variability of small-scale family producers of North-eastern Argentina	1.1 Optimisation practices of agricultural, farming, and forestry production management in each one of the areas of intervention	Increase in agricultural production of small-scale family producers and reduction of economic and social vulnerability in the	3,000,000

	1.2. Implementation of a system for the management and transfer of risks targeting small- and mid-scale agricultural producers Development of two pilot tests in the region selected	face of climate change and variability. Reducing the variability in income inflow of family agricultural producers, promoting their continuity in the activity and in rural settings. Improvements in the use and productivity of water for family agricultural producers.	
	1.3 Implementation of improvements in the efficient use, catchment, harvesting, and storage of water in the areas of intervention		
2. Strengthening of information, monitoring and climate information management systems	2.1 Integration and expansion of the region'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.	1,250,000
	2.2 Development of tools (maps, indicators, modelling) for the assessment of water availability and climate variability at the level of the territorial unit		
	2.3 Setting up of an early warning system for extreme events		
	2.4 Geographic Information systems for the dynamic analysis of vulnerability and climate hazards per activity and per variable		
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.	342,000

	3.2 Training and formation addressed to municipal and provincial governmental units for hydrometeorological management and monitoring, analysis of climate information, use of methodological tools and development of modules of adaptation		
4. Project/Programme Execution cost			532,000
5. Total Project/Programme Cost			5,124,000
6. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			476,000
Amount of Financing Requested			5,600,000

PROJECTED CALENDAR:

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

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	March 2013
Mid-term Review (if planned)	December 2014
Project/Programme Closing	June 2016
Terminal Evaluation	December 2016

PART II: PROJECT / PROGRAMME JUSTIFICATION

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

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

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

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

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

The adoption of a participatory approach is an essential part of the rationale behind the project since such approach will see to: a) satisfy the needs and demands of the target population, b) strengthen the beneficiaries in their actions as a group and as individuals through the specific practice of preparing and implementing their own projects and, c) increase participation of the beneficiaries in the several stages of any project – in the decision-making, in the follow-up, and evaluation – in such a way that transparency, fairness and actual implementation of the project can be ensured.

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

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

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

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. Furthermore, bearing in mind the significance of forage planning, pilot testing will be implemented in the different agro-ecological areas of the region proposed.

Forage planning proposed as technical and methodological tool for the production management of carrying capacities and for the sustainability of the agro-ecosystems will allow considering the evolution and climate perspectives of each season as well as the

response capacity of the different forage species and natural grassland pursuant to the expected changes and the variability observed in water availability.

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

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

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

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

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

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

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

Even if in Argentina there is a well-consolidated agricultural-oriented insurance market covering against risks such as hail and frost aimed at agricultural production of the Pampean region, the development of insurance against multiple risks covering cutbacks in the production as a result of other climate factors such as drought or water surplus is virtually nonexistent, as is insurance for farming production.

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

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

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

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

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

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

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

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

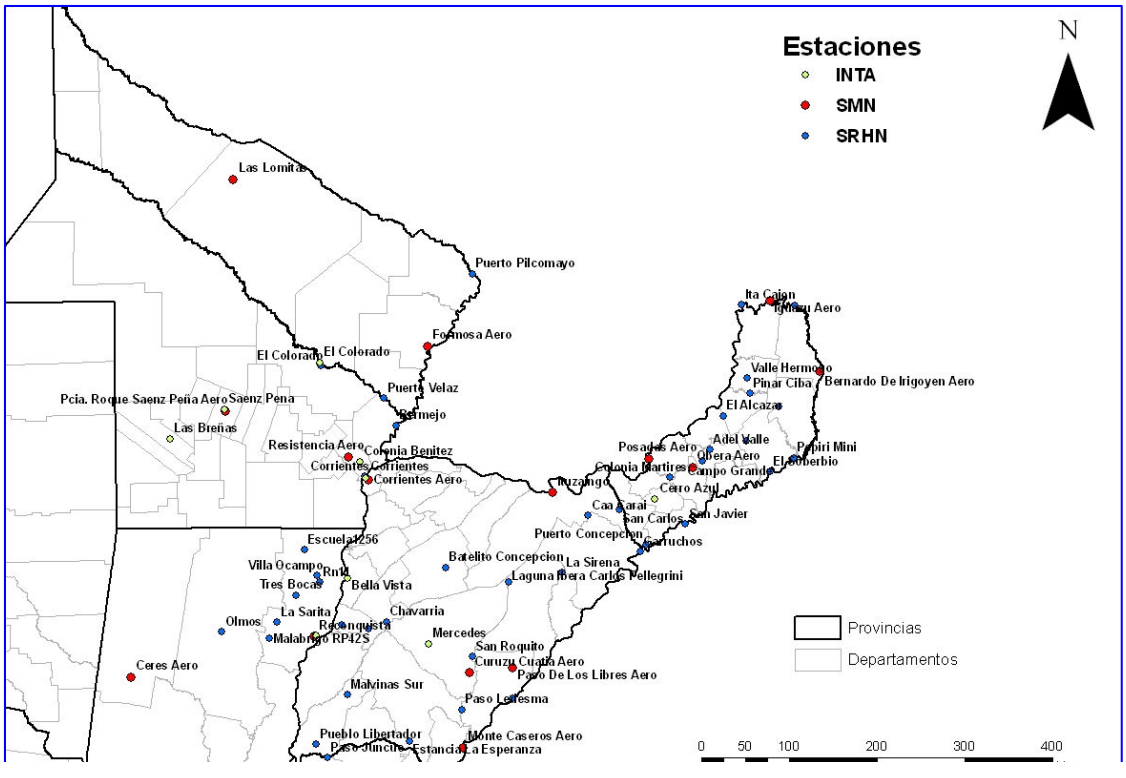
Component 2: Strengthening of information, monitoring and climate information management systems

One of the main constraints at the time of making decisions for the implementation of measures of adaptation to climate change and reduction of risks of disasters is the degree of certainty regarding climatic events on the mid and long terms. This component is designed to support the strengthening processes of the regional and local information systems, 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 of the region.

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

The following map shows the location of weather stations belonging to the SMN, agro-meteorological stations belonging to the INTA, and pluviometric stations belonging to the Under-secretariat of Water Resources. Weather stations of the SMN meet WMO standards for surface synoptic stations. The INTA stations also gauge supplementary physical and biological elements, useful to determine the relation between weather and the life of plants and animals. Pluviometric stations only report back daily accumulated precipitation values.



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

	Synoptic or agro-meteorological stations	Pluviometers	Total	Surface area (km2)	Density (km2 per pluviometer)
Formosa	2	1	3	72,066	24,022
Chaco	6	4	10	99,633	9,963
Santa Fe (north)	3	7	10	60,000 (approx.)	6,000
Misiones	5	14	19	29,801	1,568
Corrientes	8	17	25	88,199	3,528
Santiago del Estero	1	0	1	136,351	136,351

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

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

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

Output 2.2 Development of tools (maps, indicators, modelling) for the assessment of water availability and climate variability at the level of the territorial unit

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 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 regions 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.

A water balance is required to be prepared 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.

Output 2.3 Setting-up of an early warning system for extreme events

A key element for decision-making that will allow to manage risk 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 outputs on hydrometeorological hazards through the use of information generated via the monitoring network expanded as set forth in component 2.1. Also it would aim for the integration of technical teams, unification of criteria and indicators, and an appropriate system of analysis, warning, and decision-making.

Furthermore, appropriate communication tools which will allow to disseminate the information generated and warning alerts to the rural population will be carefully analysed for the implementation of prevention measures. Coupled with the development of emergency plans, the EWS mentioned in this sub-component will allow minimize the impacts upon the human, production and ecological systems of the region.

This EWS will comprise the above described information management systems, reinforcing regional capacity of hydroclimate risk management supporting local production processes.

Output 2.4 Geographic information systems for the dynamic analysis of vulnerability and climatic risk per activity and per variable

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

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

This component centres around the generation of local and regional capabilities and around communication to a broad array of direct and indirect stakeholders on the issue of climate change and variability, particularly on the progress, results, lessons learned, and best practices deriving from the project's implementation.

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

This sub-component includes the development of workshops and seminars and the generation of educational material for communicating and forming in the issue at hand and the adaptation measures implemented.

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

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

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

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

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

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

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

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

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

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

conditions of the producers in marginal lands, thereby preventing the achievement of sustainable development.

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

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

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

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

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

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

The inclusion of considerations of adaptation to the effects of climate change into Argentina's public policies is in most cases rare and fragmented. Although a national process has begun whereby a national strategy is being developed on climate change, reality dictates that the processes of reaching consensus among the different governmental agencies, and between these and civil society, require an evolution that

takes considerable time without even mentioning the assignment of resources which are in many cases scarce.

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

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

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

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

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

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

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, sector strategies, national

communications, or national adaptation programs of action, or other relevant instruments, where they exist.

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

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

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

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

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

Likewise, 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 (PEA²) 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 PEA² 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.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

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

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

Training workshops and seminars will also be conducted for local, provincial and national officials with the purpose of strengthening institutional processes aiming at identifying risk situations, assessing key factors and designing and implementing appropriate measures of risk reduction and adaptation to climate change.

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

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.

Also, in November 2011 a workshop 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.

A critical part of developing a final proposal will be to conduct a series of activities devoted specifically to carry out consultation with key stakeholders of the area of implementation (small-scale family producers grouped in producers' associations per activity and per geographic area; local authorities belonging to the municipalities in each one of the districts; leaders of the indigenous communities; associations of peasant women, etc.). This process will enable not only to identify those actions which will better fit the needs of each one of the groups identified, but will also help create the channels and modalities for their active participation in the project's development.

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

Argentina, with its great variety of climates and ecosystems, and an economy strongly based on primary production and manufacture of derived products, is highly sensitive to changes in rainfall and temperature patterns. Specifically, the area of intervention is one of the geographic areas where the historic series recorded and the results of projection studies show a clear increase in the intensity of contradictory extreme events such as droughts and floods, occurring many times within the same year. As a result, commencement of a process of internalising production practices specifically designed to incorporate the considerations of such anomalies becomes necessary, as it becomes necessary also to generate the institutional capability that will allow the implementation of public policies to reduce poverty providing for 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 considering the effects of climate change and variability upon the production processes of this social stratum in particular. It is important to point out that, whereas medium-sized and large-sized producers have the appropriate technologies and tools to generate adaptation processes, access to information and adequate means constitute an important constraint when thinking of a temporal horizon that exceeds the survival of the family group in terms of avoiding migration to cities with negative consequences for the individuals who usually get trapped in indigence loops.

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

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

The different components and its associated outcomes were designed based on the experience and knowledge of the technical organizations involved, particularly those of the National Institute for Agricultural Technology, which is an entity leader in the country in terms of technological innovation and rural extension. Also, the engagement of the Agricultural Risk Office of the Ministry of Agriculture, Farming and Fishing, and the participation of the Climate Change Office of the Secretariat of Environment and Sustainable Development in the preparation ensure that not only national maximum standards are met in terms of environmental protection and sustainable development but also the development of the project is aligned with the strategic guidelines prepared by the national government together with the provinces. This guarantees that, strategically speaking, the implementation and follow-up of the activities provided for in the project, regardless of its horizon of implementation, is ensured thanks to the participation of organic agencies answering to long term plans such as the Strategic Food Plan and the Climate Change National Strategy.

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

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

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

A project's general Coordinator shall be appointed, together with a technical assistant, who will be responsible for the project's day-to-day operations. Their function will be to supervise the execution of the different modules, the drafting of the assessment reports,

and to coordinate, supervise, and support the activities of the Implementation Technical Unit. Also, there will be a Field Coordinator who shall supervise the activities in the field reporting back to the General Coordinator and supporting its functions.

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

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

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

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

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

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

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

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

Given that this project seeks to address the adaptation required over a long time period, there is a risk that the decisions and actions taken during the project may not be ratified by future administrations. During the design of the project, measures and commitments to mitigate this risk shall be discussed.

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

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

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

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

D. Include a results framework for the project proposal, including milestones, targets and indicators and sex-disaggregate targets and indicators, as appropriate. The project or programme results framework should align with the goal and impact of the Adaptation Fund and should include at least one of the core outcome indicators from the AF's results framework that are applicable[6].

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

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

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

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

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

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