REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE 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

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ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	Regular Project
Country/ies:	Peru
Title of Project/Programme:	AYNINACUY: Strengthening the livelihoods for vulnerable highland communities in the provinces of Arequipa, Caylloma, Condesuyos, Castilla and La Union in the Region of Arequipa, Peru
Type of Implementing Entity:	Regional Implementing Entity (RIE)
Implementing Entity:	Development Bank of Latin America (CAF)
Executing Entity/ies:	Special Project COPASA
Amount of Financing Requested:	$ 2,897,053.00 (in U.S Dollars Equivalent)

Project / Programme Background and Context:

Introduction

South American camelids such as alpacas, llamas and vicuñas inhabit the Andean highlands above 3,000 meters, in Peru, Bolivia, Argentina and Chile. Peru, leading producer of alpaca fiber, is home to the greatest number of camelids, with a population of about 5 million of all kinds, predominantly alpacas (on the order of 3.7 million).

In Peru raising Andean camelids is the main livelihood among the highland communities, whose population engaged in this activity, is estimated to be approximately 1.5 million. Camelid producing areas in Peru include the provinces with the highest levels of poverty and marginalization. [1] Moreover, this activity takes place mainly in highland *puna*[2] ecosystems

[1] E.C. Quispe, T.C. Rodríguez, L.R. Iñiguez y J.P. Mueller. Producción de fibra de alpaca, llama, vicuña y guanaco en Sudamérica [*Alpaca, llama, vicuña and guanaco fiber production in South America*]. Animal Genetic Resources Information,

(generally in Peru, above 3,800 meters), an ecosystem whose characteristics, although they allow for the raising of alpacas and llamas, hardly favor the development of agriculture.

Due to the impacts of climate change, whose peculiarities will be explained below, the activity of raising camelids by vulnerable Andean highlands communities in Peru has been being severely affected, with cyclical annual losses in thousands of heads of camels, which threatens the sustainability of these communities' principal livelihood.

In the highland communities of the Arequipa Region, in Peru, raising these camelids, in particular, alpacas, centers on the production and sale of alpaca fiber. As this project is an initiative of an entity under the Regional Government of Arequipa, the project is focused on the development of a comprehensive strategy to strengthen the activity of raising alpacas for fiber production in the vulnerable Andean highland communities of the Arequipa Region.

The problem the project seeks to address

The process of global climate change is determined by progressive changes in the global, national and local climates; these fluctuations cause changes in the frequency and intensity of extreme climate variability. Peru is one of the tropical countries that are more acutely affected by the retreat of glaciers in mountain ranges that were in previous years covered with snow. Within the Peruvian territory the effects of climate change also differ, by region and socioeconomic levels, and, in the distribution of negative climate impacts, the rural poor of highland mountain ecosystems will bear the brunt of these changes. In these areas, glacier retreat has reduced the availability of water and has led to the desertification and soil degradation.

On the other hand, while drought, cold spells, and frost are phenomena that have always been present in many regions, like the case of Arequipa, Peru, the effects of climate variability have resulted in these phenomena recently being more frequent and intense at these altitudes. Consequently, this intensification is causing severe damage to this region's fragile environment, affecting one of its most vulnerable population groups, located in the high Andean mountains. In particular, this has an impact on the health and survival of camelid herds, in the main, alpacas, which are essential for their subsistence.

The aforementioned effects of climate variability have an impact on overall alpaca fiber production in the highlands of the Arequipa Region: diminishing water availability increases desertification which leads to a decrease in the areas available for grazing; during droughts, the capacity for pastures to support grazing is significantly reduced. This absence of sufficient available areas leads to overgrazing; new wind patterns destroy traditionally built shelters for the protection of camelids; the exposure of the alpacas to more intense cold, coupled with the lack of pasture for adequate nourishment, has an impact on their health and induces seasonal

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2009, 45, 1–14. © Food and Agriculture Organization of the United Nations, 2009-doi:10.1017/S1014233909990277. NOTE: More recent information is not available.

[2] The *Puna* Ecoregion, or simply *Puna*, is a highland region, or high plains plateau, specific to the central zone of the Andes mountain range. It comprises a neo-tropical biome of the mountainous grassland type. It is found in regions stretching from northern Argentina, western Bolivia, northern Chile to the central and southern regions of Peru. Altitudinal parameters vary from country to country and per latitude. In Peru, the *puna* grasslands are found at 3,800 to 4000 masl.

mortalities in these herds; the reduction in the number of animals and the deterioration in their well-being significantly affects the production of alpaca fiber and threatens the sustainability of this way of life.

Moreover, the decreasing availability of water leads to the use for human consumption of unfit sources, which affects the population's health, while the new heightened cold conditions critically increase the frequency of respiratory diseases, particularly among children.

This project constitutes an initiative focused on the endeavor to strengthen the activity of obtaining and selling alpaca fiber, an activity that is the main and almost exclusive means of livelihood and source of income for the vulnerable Andean highland communities in the provinces of Arequipa, Caylloma, Condesuyos, Castilla and La Union in the Arequipa Region of Peru. [3] To strengthen this way of life, the project seeks to strengthen the activity of raising alpacas to obtain fiber among the enumerated communities, while improving resilience at the local level through the development of basic infrastructure for access to water drinking and by implementing a pilot activity to strengthen the assets of housing communities covered by the project. In this way, the project will contribute to the sustainability of the economic activities of marketing, use and export of alpaca in Peru, as well as the livelihood and ancestral cultural values they represent.

The photograph illustrates the processes of overgrazing that occur in the project area, due to water scarcity as a consequence of climate change, in one of the Andean highland communities in the Arequipa Region. **Source:** COPASA Archives.

Climate change scenarios that weigh on the problem

Temperature patterns, soil desertification and water availability

[3] In Peru, the largest political administrative divisions are the departments, and their governments are called regional governments. Each region or department is then subdivided into provinces, and these into districts. This project is conceived for the Arequipa Region (Department), focusing on five (5) of the Region's eight (8) provinces: Arequipa, Caylloma, Condesuyos, Castilla and La Union. It can be noted that the name *Arequipa* is used to denominate both the Region and a province of the same. Additionally, the city of Arequipa is the capital of the Province of Arequipa and the Department/Region of Arequipa.

The process of increasing global temperatures that affects the planet is made apparent in the Peruvian highlands through an accelerated rate of loss of water resources. The glaciers are disappearing and the rivers have dramatically decreased their flows, producing negative impacts on flora and fauna.

One particular manifestation of climate change affects Andean rural livelihoods is the acceleration of topsoil desertification. The process of topsoil desertification is caused in part by loss of vegetation cover from overgrazing, and the abandonment of traditional practices that allowed for soil recovery periods. Now, with climate change causing additional stresses on the soil due to rising temperatures and changing rainfall patterns, the loss of natural[4] and cultivated pastures[5] for livestock makes raising alpacas, highly precarious. Climate change is affecting the local economy of rural households in this direct way.

On the other hand, there is a high risk that rural poverty in the highlands of Peru will worsen due to climate change's negative effects, such as reduced availability of water volumes in area springs and increasingly irregular rainfall. Both of these sources are principal conditions for the sustainability of the livelihoods derived from raising alpacas for fiber production and marketing.

Climate change is also reflected in the widening gap between nighttime and daytime temperatures, ranging from minus 15 ° C to 25 ° C. Temperatures are lower at night and more notably so in the months when frost forms (May and June). Moreover, the highest temperatures occur in the months when it does not rain: there is sweltering heat during the day, punishing people, animals and plants (a sort of Indian summer).

The following table provides the changes in temperature and precipitation recorded in the area of interest for the project: Arequipa.

Table 1

Region	Period	Variable	Trend
Arequipa	1964-2006	Low Temperatures	Annual:from+0.12 to +0.57 C°/decade
			Summer: from-0.07 to +0.56 C°/decade
			Winter: from+0.26 to +0.5 C°/decade
	1964-2006	High Temperatures	Annual: from +0.06 to +0.42 C°/decade
			Summer: From-0.07 to +0.42 C°/decade
			Winter: From+0,02 to +0,44C°/decade
	1964-2006	Precipitation	From -2 to +1.5 mm/decade
			Annual: from +/-01 to +0.2mm/year

Source: Inter-American Development Bank: The Economics of Climate Change in Peru/Inter-American Development, Economic Commission for Latin America and the Caribbean-2014

In addition to the changes recorded in temperature and precipitation, a significant reduction in the areas covered by glaciers in Peru has been observed. These glaciers regulate the water

[4] In the area, natural pastures are provided by local typical high altitude wetlands (*bofedales*).

[5] The use of native varieties such as *ichu* and *chillihua*, which are not resistant to the cold, can be replaced by improved and more resistant varieties such as ryegrass and dactylis glomerata.

flow within hydrologic basins fed by snowmelt as irrigation systems (see Tables 1 and 2) (Majes River, Arequipa-Peru).

Glacier Retreat Trends in Peruvian Andes**:** The following table synthesizes the evidence of glacier retreat in the Peruvian Andes (ENSO). The ENSO[6] cycle displays two phases: a warm and positive one (El Niño) and another cold or negative phase (La Niña).

. Table N° 2[7]

REFERENCE/PERIOD	TRENDS AND IMPACTS
Mark and Seltzer (2003) (1965-2002)	22% reduction in the total area of glaciers; 12% reduction in the supply of drinking water in the coastal region (where 70% of the population lives). The estimated volume of water lost is approximately seven billion cubic meters.
Consejo Nacional del Ambiente (CONAM, 2001) (1970-2002)	Up to an 80% reduction in the extent of smaller glaciers (below 5200 masl) and the loss of 188 million cubic meters of water reserves during the past 50 years.
Mark et al. (2005) (1998-2004)	In the Cordillera Blanca mountains, the Yanamarey glacier retreat between 2001 and 2004 was 23% higher than between 1998 and 1999, and was responsible for increases of 58% of the annual average discharge in the Santa River.
Mark et al. (2005) (1977-2004)	Retreat of Yanamarey glacier, receding at a rate of 20 m/year (average 1977-2003), four times faster than the 5 m/year observed between 1948 and 1977.
Pouyaud et al. (2005) (1953-1997)	13% increase in discharge from the Llanganuco lagoon in the Cordillera Blanca mountains.
Pouyaud et al. (2005) (1985-1996)	In the last ten years the ice cap of the Pastoruri[8] glacier has shrunk by almost 40%.
Silverio (2004) (1950-2006)	Up to a 50% reduction in the extent of the Coropuna[9] glacier, creating problems in the irrigation of the Majes Pampas.

Source: Inter-American Development Bank, The Economics of Climate Change in Peru / Inter-American Development Bank, Economic Commission for Latin America and the Caribbean-2014

Based on the 2009 analysis of ten indices of extreme events conducted by the SENAMHI (for its acronym in Spanish) –National Meteorological and Hydrology Service of Peru - covering the period from 1965 to 2006, the following is reported:

- The minimum and maximum temperatures have increased as much as 0.2 °C per decade in almost the entire country.

[6] The ENSO cycle is part of complex set of interactions which connect the ocean's surface and the atmosphere in the tropics of the Pacific Ocean. Changes in the ocean affect the atmosphere and influence climate patterns on a global level.

[7] (The basis for the elaboration of this table was extracted from the document generated by the Inter-American Development Bank (BID, for its acronym in Spanish) and the Economic Commission for Latin America and the Caribbean (CEPAL), within the framework of the Regional Study of the Economy of Climate Change (ERECC for its acronym in Spanish) in Latin America and the Caribbean, coordinated by CEPAL, with support from the Government of Peru and financing from the IBD (BID).

[8] A snow-capped peak located in the department of Ancash, Peru.

[9] Snow-capped peak in the Arequipa region.

- There is a greater recurrence of droughts as regards rainy seasons in the whole country, particularly in the central mountain region.
- The southern mountain region has seen a greater frequency of mild and severe droughts in the preceding decades.
- The annual variations in Peru's climate are in large measure determined by the presence of the climate phenomenon known as "El Niño" Southern Oscillation

Climate Changes Scenarios Anticipated for the Arequipa Region

Below are the description of some climate change scenarios for the provinces of Castilla Media and Condesuyos in the Arequipa Region. Given that the environmental characteristics of these provinces are representative of the project's target area, it can be reasonably expected that their outcomes, that is, those scenarios identified for these provinces, are applicable to the other highland areas of the Arequipa Region.

If the Castilla Media and Condesuyos provinces can be used as representative of the climate's comportment in the inter-Andean provinces in the Arequipa Region, then the studies realized by Climate Change Adaptation Pilot Measure point to the likelihood that significant disturbances in the climate will occur over the next twenty (20) years in the Region.[10]

Temperature Changes

The projections for temperatures changes to 2030 indicate that the variations of minimum and maximum temperatures will expand by almost 4 centigrades, both upward and downward. Both the winters and summers will tend to be atypical, with a predominance of heat waves and a reduction in the number of cold days and nights. In accordance with an initial study realized by the Brazilian entity Center for Weather Forecasting and Climate Study (CPETEC, for its acronym in Spanish) for the Arequipa Region, by the end of the twenty-first century in a best case scenario, air temperatures will vary upward between 2 and 3 ◦C, and from 3 to 5 ◦C in a worst case scenario, with the most intense increases occurring "the altitude band ranging from 3000 to 4000 masl.". For the period from 2017 to 2100, two scenarios have been identified, one best case (related to low emission) and another worst case (related to high emission).

For the aforementioned worst case scenario A2, the study concluded that, for summers, all the models show a warming trend, with gradually increasing temperatures until the end of the twenty-first century, in which the temperature could see increases on the order of almost 4 to 5◦ C greater than the current climate. The observed temperatures trends, although with few weather stations, suggest that during the past 40 years the air temperature has increased in the Arequipa Region, with the trend revealing itself more in the lower temperatures than the highs. This warming has been greater since the middle of the 1970s, with higher numbers, both in the maximum as well as the minimum temperatures during the years in which El Niño was active.

Rainfall

The trends in temperatures, as well as the eventual concurrent El Niño phenomenon, indicate that there could be a critical period between 2013 and 2016. The favorables periods in the past would last between 6 and 9 years are tending to last only 4 to 6 years. At the same time, the

[10] Climate Change Adaptation Pilot Measure. Study developed for COPASA (2007). José Marengo.

frequency of the return of critical periods will likely be reduced from every 6 to 9 years to every 4 to 6 years. WIth this there will be a reduction in precipitation, especially in the highlands, which will affect not only the water recharge cycles, but also the retention capacity of the snowpack at the highest elevations. As a result, the surface area of the glacier will continue to shrink a rhythm that could exceed by 50% the current rhythm, leading to their disappearance in a brief period of time. This, at the same time, will feedback into climate change factors further reducing the region's capacity to retain and store water. The areas of greatest social impact will likely be the lower and middle parts of the inter-Andean valleys, however, the ecological impact will be felt in the entire zone. In summary, the trends in temperature and in precipitation indicate that climate change in the region will tend to become more acute in the coming years both in rhythm as in intensity, principally manifesting itself in an increase in median temperatures between 2 and 4 centigrades in the areas immediately surrounding the Region's snow capped peaks. This will be accompanied by the reduction of rainfall and an increase in the return cycle and duration of critical periods. These scenarios are clearly subject to some uncertainty due to the confluence of unpredictable variables (variations in the emission of CO2, natural climate variations, unpredictable geodynamic events, etc.). These all do, however, raise an alert as to a high probability trend that makes the task of taking preventive measures essential.

Experiencia AEDES

The AEDES Experience

AEDES, in partnership with GWP Global Water Partner, produced a document titled 'CAMBIO CLIMÁTICO, RETROCESO GLACIAR Y GESTIÓN INTEGRADA DE LOS RECURSOS HÍDRICOS' (Climate Change, Glacier Retreat and Comprehensive Management of Water Resources), in which it is noted that in the face of glacier retreat:

- "Climate Change is undeniable and evident. The principal cause is the burning of ever increasing amounts of petroleum, gasoline and coal, the felling of forests and some methods of agricultural production. These human activities have increased the volume of 'greenhouse gases' (GHG) in the atmosphere"

- The entirety of Andean tropical glaciers is suffering visible processes of retreat.[11]

- The different studies point out that in the last 30 years Peru has lost 22% of its glacial area. Between 1980 and 2006, the *Cordillera Blanca* lost 33% of its area (annual loss, 9.3 km^2). The Pastoruri peak has lost 40% of its surface area between 1995 and 2007 (1.1 km^2 in 2007)17. The *Coropuna* peak retreats approximately 2.4 km^2 per year 18. Between 2003 and 2007, the area on the *Salkantay* peak has diminished by 4.11 km^2, which means a retreat of 1.02 km^2/year.

- This glacier retreat in the coming years will be catastrophic for various ecosystems and sectors, with the following consequences:

[11] In 2007, the Andean Community (CAN, for its acronym in Spanish) was noting that the glaciers in Peru (which represent 71% of the total), 2 those in Bolivia 20%, in Ecuador 4%, in Colombia 4% and in Venezuela 1%. Of all the world's tropical glaciers, the ones in Peru are the highest. In South America, between Bolivia and Venezuela, these tropical glaciers cover an area of approximately 2758 km2 (Jordán 1991).

- Reduction in the availability of water.
- Increase in desertification and arid areas.
- Pest infestations and blights will increase in harvests.
- The distribution of some human diseases will be modified and others will arise

Socioeconomic Context

Peru accounts for 80% of supply of alpaca fiber in the world market. In 2014, the exports of this product totalled almost USD 60 million, which corresponded to 0.16% of the total Peruvian exports for the same period. Moreover, exports of garments made of alpaca fiber were valued at a similar amount for the same period, while they accounted for 3% of total Peruvian exports. Despite not occupying a dominant position, the manufacture of alpaca forms part of an important sector in the Peruvian economy (25% of Peruvian companies is dedicated to textiles and clothing, a sector that accounts for 11% of manufacturing GDP and 2 % of national GDP). In the production of alpaca fiber in Peru, the contributions by small breeders (small-scale production) are the majority, contributing 85%.

As regards breeding and raising alpacas in Peru, in the most recent census of the animal population[12], 12% of that population corresponds to the Arequipa Region. There are approximately 120,000 alpaca breeders in Peru and around 5,400 are in the region of Arequipa. The average farmer in the region of Arequipa has averaged 102 camelids. A breeder's average herd size in the Arequipa Region is 102 alpacas.

As regards producers' organizations, there are at least 50 camelid fiber producer organizations in Peru, of which 9 are in the Arequipa Region. The camelid breeders' groups traditionally take the form of Civil Nonprofit Association (ACSFL, for its acronym in Spanish), although, in recent years, and particularly in Arequipa, they are tending to form Special Producers' Cooperatives.

The project focuses its attention on the highland Andean communities in the provinces of Arequipa, Caylloma, Castilla, Condesuyos and La Union. They are located in the Arequipa region of Peru, whose only feasible economic activity is raising alpacas, an activity originating in the Andean region, where the headwaters of the largest water resources in the region are located (lakes, snowcapped mountains, springs, etc), and where few highland crops can be grown.

The water resources on which development in the high Andean zones is based originate with water flows at 3800-4000 meters above sea level. These headwaters are very fragile and vulnerable to climate change and to environmental and social impacts, all of which are leading to the gradual abandonment of camelid raising in the Andean highlands. A consequence of the abandonment of this activity is to push internal male migration, further towards the pull of employment expectations generated by mining.

[12] Censo Nacional Agropecuario 2012 [National Livestock Census 2012]. http://censos.inei.gob.pe/cenagro/tabulados/

The populations residing in highland climates, who are financially dependent on high Andean flocks (mainly camelids: alpacas, llamas and vicuñas), are subject to profound climatic vulnerability and deep poverty, due to the fact that they make their livelihood solely through the shearing of their alpacas for fiber, and of vicuñas on a smaller scale. These herds represent the only capital these family groups have to ensure their survival (on average a family possesses 102 alpacas). In spite of these precarious circumstances, Peru continues to be the world leader in the production of alpaca fiber, notwithstanding the limited shearing technology which is done manually in the main as well as the high mortality rate among the herds during cold spells and droughts as a consequence of lack of adequate forage.

The alpaca raising communities occupy a very low position on the HDI list (Human Development Index); life expectancy and education within these communities show a great disparity in comparison to other cohorts with similar current average national income levels. In the near future climate change will be more pronounced, representing risk in terms of both life expectancy (high mortality of children and seniors due to respiratory diseases) and household income (higher mortality and decreased fiber production alpaca).

Below is a table illustrating the demographic composition of the population of the project's target area. The registered camelid population is also included.

Table Nº 3[13]

POPULATION DATA[14]						
Nº		PROVINCE	DISTRICT	ALTITUDE (masl)[15]	POPULATION (inhabitants)	CAMELIDS POPULATION
	D					
1	1	Arequipa	San Juan de Tarucani	4210 to 5400	2,195	40,000
	2		Chiguata	2960	2,896	3,000
	3		Pocsi	3047	565	1,500
	4		Quequeña	2550	1,344	1,500
	5		Polobaya	3091	1,481	2,500
TOTAL					**8,481**	**48,500**
2	1	Caylloma	San Antonio de Chuca	4800	1,522	43,000
	2		Sibayo	4200	710	16,000
	3		Tuti	4200	794	14,000
	4		Callalli	4300	2,138	84,000
TOTAL					**5,164**	**157,000**
3	1	Castilla	Chachas	4200	1,791	34,000
	2		Andagua	3587	1,201	5,000
	3		Orcopampa	4200	9,381	14,000
TOTAL					**12,373**	**53,000**
4	1	Condesuyos	Chuquibamba	3500	3,447	3,000
	2		Andaray	3500	689	15,000
	3		Yanaquihua	3500	5,633	2,000
TOTAL					9,769	20,000
5	1	La Union	Pampamarca	3200	1,315	6,000
	2		Huaynacotas	3200	2,321	14,000
	3		Puika	3658	2,848	24,000
TOTAL					**6,484**	**44,000**
GRAND TOTAL					**42,271**	**322,500**

Source: National Institute of Statistics and Computing-INEI Peru (2012) **Chart:** Provided by COPASA-Arequipa

[13] IV National Agriculture and Livestock Census, 2012
[14] Source: Population and Housing Census
[15] Meters above sea level

Next, a table is included which describes the human development indices in the target area.

Table Nº 4

Peru: Human Development Index, at the national, departament, provincial and district levels 2007			
LOCALE		PERU	AREQUIPA
Population	INHABITANTS	27.428.615	1.152.303
	RANKING		8
Human Development Index	HDI	0.6234	6479
	RANKING		5
Life expectancy at birth	YEARS	73.07	73.51
	RANKING		8
Literacy	%	92.86	95.87
	RANKING		6
Level of Schooling	%	85.71	90.73
	RANKING		2
Educational Achievement	%	90.48	94.19
	RANKING		3
Per capita Family Income	MONTH	374.1	434.8
	RANKING	1	2

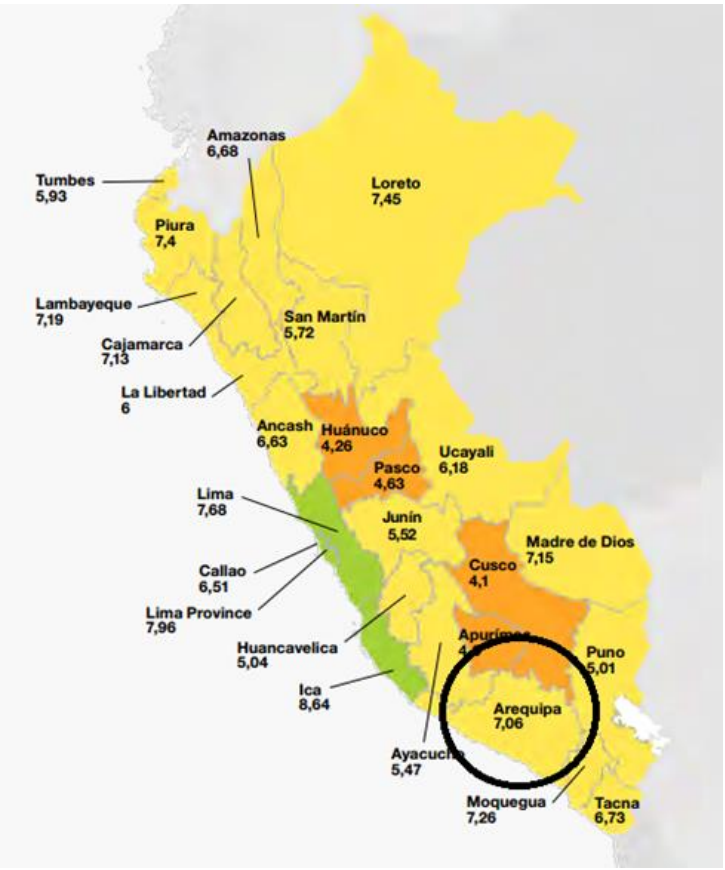
Source: UNDP (Peru: Human Development Index, at the district, provincial, departmental and national levels, 2007, Pg. 164**)**

Environmental Context

In the Peruvian Andes, where the project is focused, the highland areas found above 3,800 mts (*Altiplano* and *Puna*), are characterized by a frigid climate, where the average annual temperature is 3.1° C, with highs of 14.0° C in summer and 10.7° C in the winter. The rainfall reaches amounts varying between 481- 926 mm annually.

Environmental Context: Vulnerability to Climate Change

Below is the vulnerability map for administrative areas and cities in Peru, as well as vulnerability indices to climatic changes, exposure, awareness and adaptive capacity in the administrative areas and cities.


Amazonas
6,68
Tumbes
5,93
Loreto
7,45
Piura
7,4
Lambayeque
7,19
San Martín
5,72
Cajamarca
7,13
La Libertad
6
Ancash
6,63
Huánuco
4,26
Ucayali
6,18
Pasco
4,63
Lima
7,68
Junín
5,52
Madre de Dios
7,15
Cusco
4,1
Callao
6,51
Lima Province
7,96
Huancavelica
5,04
Puno
5,01
Ica
8,64
Arequipa
7,06
Ayacucho
5,47
Moquegua
7,26
Tacna
6,73

Vulnerability to Climate Change Map

Riesgo bajo — Riesgo extremo

Low risk — *Extreme risk*

Área administrativa	Índice de vulnerabilidad al cambio climático	Índice de exposición	Sensibilidad	Índice de capacidad adaptativa	Ciudad	Índice de vulnerabilidad al cambio climático	Índice de exposición	Sensibilidad	Índice de capacidad adaptativa
Amazonas	6,68	6,00	5,31	5,32	Chachapoyas	4,19	5,91	2,93	5,32
Ancash	6,63	7,88	3,45	5,32	Huaráz	4,76	7,03	2,90	5,32
Apurímac	4,60	4,65	4,12	5,32	Abancay	2,97	3,36	4,41	5,32
Arequipa	7,06	6,85	6,47	5,32	Arequipa	3,63	5,37	2,31	5,32
Ayacucho	5,47	5,74	4,47	5,32	Ayacucho	2,75	3,45	3,55	5,32
Cajamarca	7,13	8,23	2,45	5,32	Cajamarca	5,16	7,58	3,23	5,32
Callao	6,51	9,26	2,57	5,32	Callao	4,96	8,16	1,24	5,32
Cusco	4,10	3,74	5,05	5,32	Cuzco	3,94	5,58	3,13	5,32
Huancavelica	5,04	6,01	3,29	5,32	Huancavelica	3,78	4,40	4,40	5,32
Huánuco	4,26	4,26	4,37	5,32	Huánuco	2,99	3,90	3,35	5,32
Ica	8,64	9,71	5,51	5,32	Ica	6,47	9,74	2,76	5,32
Junín	5,52	5,74	4,37	5,32	Huancayo	3,60	4,65	3,62	5,32
La Libertad	6,00	7,06	3,02	5,32	Trujillo	5,69	8,81	2,41	5,32
Lambayeque	7,19	9,37	2,83	5,32	Chiclayo	1,80	3,15	2,09	5,32
Lima	7,68	8,47	3,72	5,32	-	-	-	-	-
Lima Province	7,96	9,50	2,72	5,32	Lima	5,51	8,89	1,65	5,32
Loreto	7,45	7,53	8,01	5,32	Iquitos	3,74	4,34	4,64	5,32
Madre de Dios	7,15	6,54	8,25	5,32	Puerto Maldonado	4,07	5,31	3,75	5,32
Moquegua	7,26	6,90	5,15	5,32	Moquegua	3,80	3,74	5,96	5,32
Pasco	4,63	4,10	6,41	5,32	Cerro de Pasco	3,09	3,56	4,27	5,32
Piura	7,40	8,56	2,42	5,32	Piura	5,73	9,05	2,10	5,32
Puno	5,01	5,41	5,17	5,32	Puno	2,19	1,97	3,48	5,32
San Martín	5,72	5,76	5,58	5,32	Moyobamba	4,91	5,92	5,68	5,32
Tacna	6,73	6,79	6,33	5,32	Tacna	6,04	9,09	2,85	5,32
Tumbes	5,93	6,98	3,34	5,32	Tumbes	1,93	3,41	1,88	5,32
Ucayali	6,18	6,45	7,93	5,32	Pucallpa	4,72	6,56	3,61	5,32

Image Insert: The table provides information on Arequipa, in both its urban and rural areas, as pertains to its place on indices covering vulnerability, awareness, exposure, and adaptive capacity. **Source:** Development Bank of Latin America-CAF: Vulnerability and Adaptation to Climate Change Index in Latin America and the Caribbean, Chart 31, Pg. 162

Below a map of the project's location is presented, to the scale of the Arequipa Region. In the map, the project's five target provinces are identified (Arequipa, Caylloma, Condesuyos, Castilla and La Union), and the distribution of the project's beneficiary population.

PROJECT LOCATION MAP

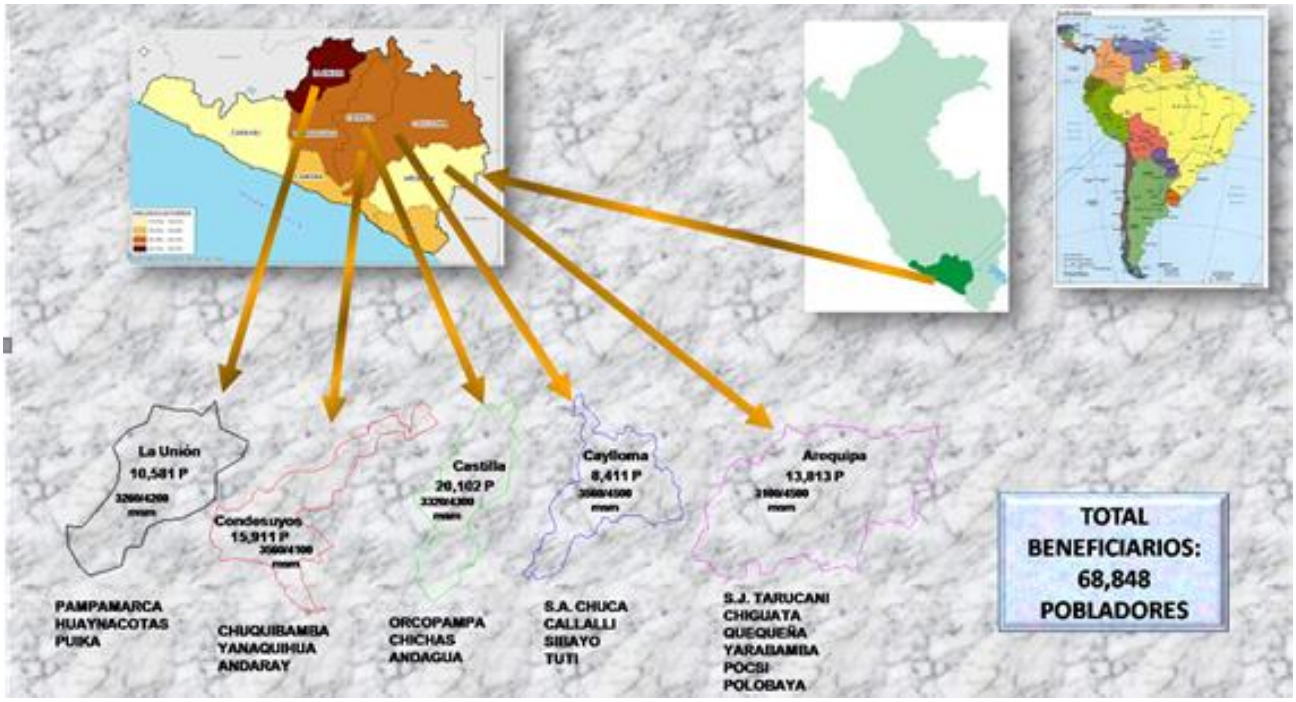


Image Insert: This map identifies the Project's various locations in the Arequipa Region, as well as population information and the number of beneficiaries. Source: Prepared by COPASA, 2015.

Environmental Context, Climate Change Impacts:

The Regional Strategy for Adaptation to Climate Change in the Region of Arequipa[16] identifies the following impacts of climate change in the target area of the project:

1. **Changes in agricultural production affecting alpaca fiber production**: Water shortage will favor the reduction of irrigated areas and the advance of desertification, which will bring as a consequence the increasing scarcity of grazing areas**,** both natural and cultivated. The scarcity of natural pastures, especially for the Andean cattle will become dramatic in the higher elevations, and result in malnutrition, disease and reduced capital represented by the region's most important livestock, camelids, in an extremely impoverished region.

Changes in temperature will favor increased frost, indian summers, and the rise of pests and diseases to higher altitudes that can affect both human health and that of the alpacas. Water

[16] Regional Government of Arequipa, Regional Environmental Authority. Regional Strategy for Adaptation to Climate Change, August 2009 Preview, Chapter IV.

availability and the increased presence of extreme climatic events can seriously affect food security in the region.

2. **Water shortage:** The main result of changes in temperature and rainfall will be the relative scarcity of water available. The volume of water deficit in the coming years can reach between 20 and 30%, with lower rates of up to 50% in the highlands. A severe drought in the years 2015-2016 is highly probable. The provision of this resource in the region depends mainly on rainfall regime, as well as the retention capacity of the snowy glacier. On the other hand the water capture infrastructure is insufficient and mainly aimed at providing water to cities; 6 of the 8 provinces have a reduced infrastructure for provisioning and management of water. The main vulnerability of the region to projected climate scenarios is due to the limitations of topography and infrastructure for seasonal water harvesting.

Scarce and poorly managed water resources: The main source of water resources are constituted by the melting and drainage from nearby peaks, from which springs originate, as well as ponds and creeks. The rivers crisscrossing the territory are of a torrential type, reaching their peak flows during December, January, February and March, with their flow reduced to exhaustion in the months of May to October. In addition to the resource's limitation, there are management practices that require improvement.

3. **Displacement and Migration:** The reduced availability of water, along with the damages to alpacas' fiber production, is likely to increase poverty in rural areas and increase rural migration to the cities. The populations most prone to these displacements are those who inhabit the poorest places in the region, especially in the provinces of Condesuyos, La Union, Caylloma and Caraveli (three (3) of them belong to the targeted project area).

4. **Human Health**: Temperature changes along with its consequences (frost, indian summers, and the rise of pests and diseases) are impacting heavily on the health of the population; in the last 9 years, cases of ARIs (acute respiratory infections) in children under 5 years have increased by more than 190.000 cases.

Photograph: Rural family in their home, in the Rural Community of Ñequeta, Province of Caylloma. **Source:** COPASA Archives (2012)

As seen in the previous picture, the construction of the houses is rustic. The traditional construction technique is not suitable for the current temperature variations, particularly for extreme descents that are becoming common.[17]

The prevalence of diseases like acute respiratory infections (ARIs) and acute diarrheal diseases (ADDs), among Andean highland populations, increases the rates of malnutrition, morbidity and mortality, especially among the most vulnerable: children, gestating women and older adults (see Tables Nos. 4, 5, 6, and 7).

The following table shows the frequency of acute respiratory infections (ARIs) the project's target provinces (2011 information). For the range of the most affected ages, younger than five years old, the incidences show a general effect on the order of five hundred children for every thousand children.

Table Nº 5

ARIS and pneumonias by province

ARIS AND PNEUMONIAS BY PROVINCE[18]							
PROVINCE	**ARIS**					**Pneumonia + 5**	
	Population - 5	**Population 5**	**Population +5**	**Total**	**TIA -5**	**Cases**	**TIA (x)**
Arequipa	75,541	3,158	4,763	7,921	42.02	62	0.82
Caylloma	9,376	35	475	833	38.18	8	0.85
Condesuyos	1,713	69	154	223	40.28	0	0.00
Castilla	3,791	127	261	388	33.50	0	0.00
La Union	1,728	51	164	215	29.51	0	0.00
(x) Cumulative Incidence Rate							
In the province of Arequipa, the rates for ARIs are 42.02 episodes per thousand children below the age of 5, and for pneumonia, 0.82 cases per thousand children below the age of 5. Source: Arequipa Regional Health Department – 2011							

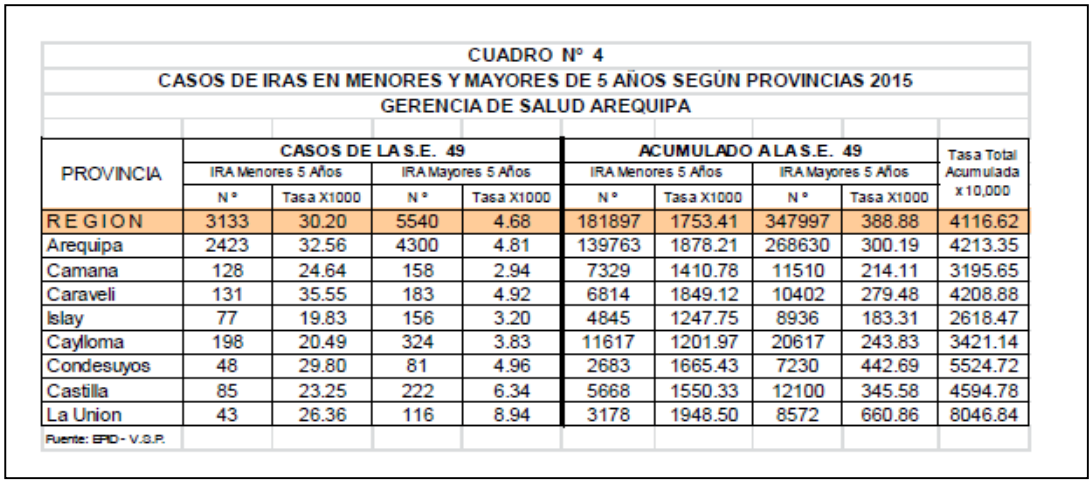
Source: http://www.bvsde.paho.org/documentosdigitales/bvsde/texcom/ASIS-regiones/Arequipa/Arequipa 2011.pdf

The following graph shows the high incidence of ARIs (acute respiratory infections) among those younger than five years of age, in the project's target provinces. The most affected province was La Union.

[17] In the majority of cases, the dwellings do not have the minimum infrastructure for avoiding cold seeping into their interior, such as weather stripping around doors, windows, and the rafters of the roof, which tends to be lacking. To this problem, meager access to energy can be added, which is called thermal comfort. The laerge majority of homes have wood-burning stoves, which are inefficient in their use of fuel.

[18] Source: Regional Office of Public Health, Arequipa; Chart: Provided by COPASA-Arequipa

Table Nº 6



CUADRO N° 4
CASOS DE IRAS EN MENORES Y MAYORES DE 5 AÑOS SEGÚN PROVINCIAS 2015
GERENCIA DE SALUD AREQUIPA

PROVINCIA	CASOS DE LA S.E. 49				ACUMULADO A LA S.E. 49				Tasa Total Acumulada x 10,000
	IRA Menores 5 Años		IRA Mayores 5 Años		IRA Menores 5 Años		IRA Mayores 5 Años		
	N °	Tasa X1000	N °	Tasa X1000	N °	Tasa X1000	N °	Tasa X1000	
REGION	3133	30.20	5540	4.68	181897	1753.41	347997	388.88	4116.62
Arequipa	2423	32.56	4300	4.81	139763	1878.21	268630	300.19	4213.35
Camana	128	24.64	158	2.94	7329	1410.78	11510	214.11	3195.65
Caraveli	131	35.55	183	4.92	6814	1849.12	10402	279.48	4208.88
Islay	77	19.83	156	3.20	4845	1247.75	8936	183.31	2618.47
Caylloma	198	20.49	324	3.83	11617	1201.97	20617	243.83	3421.14
Condesuyos	48	29.80	81	4.96	2683	1665.43	7230	442.69	5524.72
Castilla	85	23.25	222	6.34	5668	1550.33	12100	345.58	4594.78
La Union	43	26.36	116	8.94	3178	1948.50	8572	660.86	8046.84

Fuente: EPID - V.G.P.

Source: Bulletin of the Regional Health Office, Arequipa 2015

Below is a table which presents the incidence of acute diarrheal illnesses (EDAs, for its acronym in Spanish) in the project's target area for the year 2011. Also, in this case, the most affected range of ages was that of those younger than five years, with a cumulative incidence of 422 children affected out of each one thousand, and with four of the five target provinces showing significant effects.

Table Nº 7

CASES DE ADDS PER DIAGNOSTIC TYPE BY PROVINCE [19]

PROVINCE	CASES OF S.E. 52				CUMULATIVE S.E. 52				CUMULATIVE TOTAL OF ADDS			
	ADD watery		ADD amoebic		ADD watery		ADD amoebic		Minors younger than 5 years		Older than 5 years	
	-5	+ 5	-5	+ 5	-5	+ 5	-5	+ 5	Nº	Rate	Nº	Rate
REGION	422	638	14	23	0	0	0	0	34437	1758.89	39658	22819.55
Arequipa	353	551	11	18	28488	33061	798	847	29286	394.32	33908	3932.75
Caylloma	27	44	2	3	2347	2469	115	155	2462	271.26	2624	3387.29
Condesuyos	10	10	1	0	759	903	181	5	940	541.16	908	5403.80
Castilla	28	28	0	2	1067	1331	66	64	1133	298.94	1395	3963.07
La Union	4	5	0	0	575	783	41	40	616	253.21	823	6132.64

Source: http://www.bvsde.paho.org/documentosdigitales/bvsde/texcom/ASIS- regiones/Arequipa/Arequipa2011.pdf

[19] Source: Arequipa Regional Department of Health; Chart: Provided by COPASA-Arequipa

In the interests of a comparison, the following table shows the tendencies and the situation of acute diarrheal diseases (ADDs) for the year 2014. In recent years, a total of 81,947 cases of acute diarrheal illnesses have been reported, arising basically from the consumption of untreated water.

Table Nº 8

Trends and situation of diarrheal diseases (ADDs)

ADDS IN MINORS OF 5 YEARS FOR THE MONTHS OF 2014 [20]													
ADDS	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total**
ADDS watery	2743	3621	3469	3107	2490	2526	3123	3637	2911	2311	2354	2669	34961
ADDS amoebic	114	168	188	135	97	88	106	56	100	68	104	102	1326
Hospitalizations	26	33	58	51	59	53	79	76	33	32	26	20	546
Deaths	0	0	0	0	1	0	0	0	0	1	0	0	2
The most affected province was Condesuyos, with an incidence rate of 541.16 per 1000, in of 5 years of age, and La Union with an incidence rate of 6132.64 per 1000 in children older than 5 years of age.													

Source: Arequipa Regional Department of Health; **Chart:** Provided by COPASA-Arequipa

The prevalence of diseases like acute respiratory infections (ARIs) and acute diarrheal diseases (ADDs), among Andean highland dwellers, increase the rates of malnutrition, morbidity and mortality, especially the most vulnerable groups: children, pregnant women and the older adults.

Environmental Context, Impacts of Climate Change: Local Economy

Below is a qualitative list of the impacts of climate change that are affecting the local economy, in particular on the family economy of the alpaca breeders:

1. **Household Economy:**

   Climate change has been reflected in changes in wind patterns, making them more intense. This change is reflected in damage and destruction of homes, alpaca shelters (lean-tos) and affects the health of people and animals.

   As a result of water shortage and low efficiency practices in this resource's management, soil productivity (particularly in the production of pastures) is decreased, which leads to a decrease in the quality and quantity of alpaca fiber.

   Frosts that occur in the southern hemisphere's autumn and winter periods, affect human and animal health provoking diseases and causing high mortality rates among the alpaca herds. The alpaca breeders pay the associated costs.

   Frequent electrical storms in the area bring excessive rain, lightning, and thunder causing damage to the lives of people, animals as well as the destruction of homes. The rains, when heavy, cause bronchial diseases, alpacas mortality (mostly young animals). Also in these cases the alpaca breeders pay the associated costs.

[20] Source: Arequipa Regional Department of Health; Chart: Provided by COPASA-Arequipa

Hail storms are common, often accompanied by cold winds. These occasionally are accompanied by the added aggravation of snowfall, causing further harm to the health of local residents, as well as their livestock and crops. Once more, the alpaca breeders face the associated costs.

NOTE. When these phenomena hinder access to these communities the local government's budgets are affected by the associated costs.

The image below provides a recent example of media reports on this set of problems.

Jueves 11 de Junio de 2015 REGIÓN | 13

FRÍO PREOCUPA A CRIADORES DE CAMÉLIDOS, PIDEN VACUNAS

4 mil crías muertas en la provincia de Caylloma

El alcalde provincial de Caylloma, Rómulo Tinta, informó ayer que debido al frío que recrudece en su provincia han muerto entre 3 mil a 4 mil crías de camélidos sudamericanos en los distritos de Callalli, Tisco y Sibayo.

"Esto representa el 4% de la mortandad del ganado especialmente en crías. Antes, estas muertes se registraban a partir del 21 de junio pero ahora el frío se adelanto y preocupa", dijo.

Reveló que el último domingo se registró una temperatura de menos 15 °C en el distrito de San Antonio de Chuca.

Las crías de los camélidos se mueren por el frío.

Ante esta situación precisó que ha pedido apoyo al Ministerio de Agricultura y Riego y Agrorural con vacunas y cobertizos."Entregarán 160 cobertizos a nivel nacional, hemos pedido que esto aumente", dijo.

Finalmente señaló que en Caylloma, hay 500 mil camélidos sudamericanos.

10 | REGIÓN Domingo 28 de Junio de 2015

SIETE MIL ALPAQUEROS AFECTADOS POR BAJAS TEMPERATURAS

Camélidos mueren por frío en Caylloma

Un total de 25 mil camélidos han muerto en la provincia de Caylloma. Las bajas temperaturas, menos doce grados centigrados, han sido la causa de mortandad. "En el 2014 tuvimos una pérdida del 10%, de las 500 mil alpacas, hoy a pocos días del inicio de temporada ya llegamos al 5%", expresó el alcalde de la provincia de Caylloma, Rómulo Tinta. Según informó la autoridad edil por cada animal muerto se pierde de 200 a 300 nuevos soles. Tinta además, informó que gestiona ante el Ministerio de Agricultura (Minagrí) que Caylloma sea integrada en el programa "Seguro alpaquero". En la actualidad la única región que es beneficiada es Puno. Esta semana el Minagri enviará 65 mil vacunas para tratar diarreas.

Source: These images provide examples of significant herd mortality. They correspond to local newspaper REGION news (jun 11 and 28 de 2015). The June 11th title states: "Cold snap worries camelid breeders, vaccinations requested- 4,000 alpaca yearlings dead in Caylloma Province". Another June 11th title notes: "Seven thousand alpaca breeders affected by low temperatures- camelids die due to cold in Cold Caylloma". Then the text reports on the death of 25,000 head of alpacas lost in the recent season.

Photographs: Effects of the cold spell in the Arequipa Region, which caused significant mortality among the camelid herds and the destruction of homes due to heavy snowfall. **Source:** COPASA Archives (2012)

The table below provides a summary of recent impacts due to climate change on the local economy:

Table N° 9

GENERAL SUMMARY OF DAMAGES DUE TO COLD AND DROUGHT ACCORDING TO THE NATIONAL INSTITUTE OF CIVIL DEFENSE (Statistics for 2013)[16] [17]		
Population		
Persons Affected	217,997	Persons
Dwellings Affected	129,127	Homes
Agriculture		
Crops Affected	1,663	Ha
Natural Pastures Affected	216,756	Ha
Animals Affected (impacts on health)		
Cattle	65,576	Heads
Sheep	664,569	Heads
Camelids	652,550	Heads
Dead Animals		
Cattle	2005	Heads
Sheep	127,677	Heads
Camelids	129,387	Heads

Source: Elaborated by Copasa based on data from the National Institute Of Civil Defense (INDECI). https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1140/Libro.pdf

The following table shows the average annual losses of camelid breeders by family. The study was conducted by FAO in an area larger than the project's target area, which shows a different average for alpacas than that identified in the Arequipa Region.

Table Nº 10[21]

ANNUAL EFFECTIVE LOSSES (x)[22]				
SPECIES	**AVERAGE NUMBER OF ANIMALS**	**DEAD ANIMALS**	**PER UNIT PRICE US. HEAD**	**TOTAL LOSSES US $**
Alpaca	92.36	14.97	37.00	1,796.40
Sheep	40.39	3.49	50.00	174.50
Llama	23.53	1.79	120.00	214.80
Cattle	9.12	0.25	350.00	87.50
Totals	165.4	20.5	640.00	2,273.20
(x) Analysis of the impact of **anual events** in periods of extreme cold / Andean Highland - **family.** Food and Agriculture Organization of the United Nations, FAO, Emergency Rehabilitation and Coordination Unit				

Source: FAO, Regional Agriculture Bureau, Arequipa

Environmental Context, The cultural value of the alpacas raising

The living traditions of weaving in Peru go back to pre-Columbian cultures like that of Paracas, the Wari and the Incan Empires. In Peru, the most important fiber textiles from animal sources are those from vicuñas [23] and from alpacas. This fiber, in addition to its export value, is the basis of emblematic artisanal creations of Peruvian culture, such as the beautiful weavings (*tapices*) that are produced in Ayacucho's Santa Ana neighborhood, the soft Andean ponchos that are woven in many places in Cusco and Puno, *arpillería* pieces (hand-sown, quilted pieces that narrate pictorially the life of migrant populations) produced in the Pamplona neighborhood in Lima and fine baby alpacas sweaters, woven in Arequipa and Huancavelica. Some textiles are enhanced by Andean embroidery, testimony of a refined artisanal culture in Peru.[24]

From this perspective, building a panorama of sustainability for alpaca raising has a highly meaningful cultural value, because it keeps alive the links to national cultural roots and links with production centers that still make up a unique cultural network, which allows for the production of raw materials which sustains the aforementioned ancestral cultural traditions,

[21] For the elaboration of this chart, the results from field assessments in six regions of Peru and the preliminary study of the impact of cold spells elaborated by the FAO Office's Emergency and Rehabilitation Coordination Unit in Peru were taken into account. Document coordinator: Yon Fernández de Larrinoa Arcal, Sub-Regional Coordinator for Emergencies in the Andean Region (FAO). In the study, the losses are reported annually.

[22] Regional Agriculture Bureau, Arequipa

[23] Today garments made with this fiber has a high commercial value, as it is considered one of the finest in the world.

[24] http://www.mincetur.gob.pe/PECEX/lecturas_complementarias/otras_lecturas/Artesania_peruana.pdf

valuable as much for the refinement of its production, as for the value of identity to Peruvian national culture.

Institutional Context

The project is aligned with the National Environmental Action Plan - PLANAA Peru 2011-2021 which establishes as its fifth goal, forests and climate change strategies for reducing vulnerability to climate change:

- Developing and implementing regional and local adaptation and mitigation strategies in the face of climate change, reducing land and soil degradation, as well as increasing the capacity to mitigate the effects of drought, and strengthening the system of monitoring and forecasting of weather phenomena of natural and human origin.

This proposal is framed in a similar manner to the Action Plan for Adaptation and Mitigation in the face of climate change, defined by the Peruvian Ministry of the Environment which, as responsible for coordinating the implementation of the NSCC (National Strategy for Climate Change), has defined the following lines of action pertinent to the project (In these lines COPASA will provide its experience to the project):

- Promote policies, measures and projects to develop the ability to adapt to the effects of climate change and the reduction of vulnerability.
- Dissemination of knowledge and national information on climate change in Peru as it relates to vulnerability, adaptation and mitigation.
- Management of fragile ecosystems, especially mountain ecosystems to mitigate vulnerability to climate change.

Policy Framework

National Climate Change Strategy (Executive Decree No. 086-2003-PCM); its purpose is to reduce impacts and conduct research in the field of vulnerability and design action plans directed at ecological mitigation based on the CDM (Clean Development Mechanism).

A certain lack of awareness persists on the part of authorities and community leaders about the consequences of climate change, and as a result their commitments are still weak and they do not assume fully their corresponding responsibilities in the leadership of risk management and climate change adaptation programmes. This limits the adoption of disaster prevention and adaptation programmes and projects, which is why increased motivation and awareness through training and/or field days are indispensable.

Project/ Programme Objectives:

Short Title of the Project: AYNINAKUY (A word from Quechua that means ‘we together adapting’)

The project objective is to reduce vulnerability and increase adaptive capacity to respond to the impacts of climate change of the highland Andean indigenous communities in the provinces of Arequipa, Caylloma, Castilla, La Union, and Condesuyos. The project seeks to reduce the exposure of these communities, dependent on camelid fiber production, to climate-related threats, by strengthening their livelihoods through the development of local processes of adaptation and climate risk reduction and through the strengthening of community capacities to reduce the risks associated with economic losses from climate-induced effects.

This project is aligned with the results framework of the Adaptation Fund and directly contributes to the following outcomes:

AF Results Framework - Outcome 2: Strengthening of the institutional capacity to reduce the risks associated with climate-induced socioeconomic and environmental losses.

At the community level and that of local authorities, capacities for damage assessment and needs will be developed (in concert with local authorities and community leaders). Technical assistance will be provided for the development of prevention plans (in conjunction with local authorities).

AF Results Framework - Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.

Awareness raising activities will be undertaken at the local level covering the need for and the value of alternative proposals for strengthening alpaca offspring for fiber production. Activities and teaching materials will be developed to promote ownership of the skills required to use and maintain the alternatives (for the protection of camelids, to ensure adequate feed for them, to manage water so that the sustainability of natural resources used is guaranteed as well as its usefulness.

AF Results Framework - Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.

In order to restore and expand natural areas (*bofedales*-high altitude wetlands) that are used for grazing alpacas, resistant native species (red clover and white clover) will be introduced and existing rustic channels that provide for the distribution of water to these areas will be improved. These activities will increase the resilience of wetlands and help to curb land degradation and desertification processes associated with it.

AF Results Framework - Outcome 6: Strengthened livelihoods and sources of income for vulnerable populations in targeted areas.

In order to strengthen alpaca yearlings (*crías*) to improve their fiber production, the following activities will be carried out:

Photo: Example of an improved shelter for alpacas. **Source:** COPASA Archives

- Construction of shelters to protect the alpacas from the effects of cold temperatures
- Build fences and introducing pasture rotation to avoid overgrazing.
- Introduction of the use of high altitude foraging grains (Forage Barley, UNA 80 variety, *Hâtif de Grignon* or winter barley) to complement and improve alpaca nutrition to increase their resistance to cold weather.

Photo: Harvest of high altitude forage cereals. **Source:** COPASA Archives, 2015

- Reservoirs will be built into to have water available during dry seasons.

Photo: Type of earthen dyke to be constructed for the storage of snowmelt and from the short rainy season. **Source:** COPASA Archives (2012). The image corresponds to dykes operating in the region

- Promote the use of irrigation technology to optimize water use in order to increase its availability in grazing areas;

Photo: Irrigation technology in use in the Pallpata Rural Community- Espinar
Source: COPASA Archives

- Introduce the use of species for pastures which are resistant to the cold (ryegrass, dactylis glomerata) to guarantee sufficient pasture areas.
- Implement early warning systems in the rural communities. Basic meteorological stations with thermometers for highs and lows, rainmeters, humidity meters (hygrometers) to measure temperature variations, rainfall amounts and humidity in the area.

Photo: Implementation and training for the Early Warning System-EWS. **Source:** COPASA Archives

- Implement prevention campaigns on animal health to protect alpacas in the face of cold spells arising arising from climate change.

Photo: Animal Health Campaigns (alpaca deworming). **Source:** COPASA Archives

Project / Programme Components and Financing:

Project Components:

1. Implementation of measures designed to strengthen the means of livelihood and income sources for vulnerable communities in the selected areas, and the implementation of complementary measures.
2. Strengthening and development of community and institutional capacities for reducing risks associated with economic losses caused by adverse weather events.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)	Total Amount (US$)
1. Implementation of measures designed to strengthen the livelihoods and income sources of the vulnerable communities in the selected areas, and implementation of complementary measures.	1.1. Livestock and fiber production is improved with 270 alpacas shelters and health campaigns to improve the sanitary conditions of the alpacas and 72 protective fencing that are constructed.	1.1 Reduce vulnerability to herd mortality and strengthening livelihoods and sources of income for vulnerable people in selected areas.	619.400	2,213,440
	1.2. Fodder production is improved with 900 Ha of high altitude feed grains, 72 Ha of Clover sown in recovered wetlands and 72 Ha of cultivated pastures for high altitude forage and 36 high altitude wetlands recovered.		928.800	
	1.3. Water production and management is improved with 36 micro-dams for rainwater storage, 10,000 m of improved rural canals that permit expanding high altitude wetlands and 72 pressurized irrigation modules installed.	1.3 Reduce vulnerability to water scarcity and strengthening livelihoods and sources of income.	406.400	
	1.4. 5 Community water purification systems are installed to prevent diseases.	1.4 Enhance adaptive capacity to water scarcity that affects health	50.000	

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)	Total Amount (US$)
	1.5. Living conditions of 72 rural housing are improved with cold resistant specifications and composting latrines	1.5 Enhance adaptive capacity to extreme variations of temperature and hygiene conditions	187.240	
	1.6. 36 SAT early warning modules for rural communities are implemented;	1.6 Reduction of regional exposure to the dangers and threats related to the climate by enhancing adaptive capacity to friaje (cold spell) that affects health	21.600	
2. Strengthening and development of community and institutional capacities for reducing risks associated with economic losses due to the weather.	2.1. Community awareness regarding climate risk reduction and capacity building: 1. conformation of civil defense committees; 2. Educational competitions; 3. training of heads of households; 4. Training workshops and fieldwork days on technical subjects.	2. Improved awareness regarding adaptation, climate risk reduction and community capacity building.	37,392	236,292
	2.2. Preparation of technical guides on: 1. adaptation to climate change; 2. use of the early warning system; 3. adaptation and risk prevention for educational institutions; 4. Livestock production, fodder production water production and management and family housing improvement.		135,000	
	2.3. Capacity building complementary activities: 1. Workshops for 5 teams		18,900	

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)	Total Amount (US$)
	(assessment of damages and needs analysis); 2. prevention plans and training for educational institutions; 3. Training workshops for municipals authorities and community leaders; 4. Disaster simulations at the district level;			
	2.4. Long-term adaptive management and dissemination strategy.		45.000	

Project/Programme Execution cost	232.725
Total Project/Programme Cost	2.682.457
Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)	214.597
Amount of Financing Requested	2.897.053

Projected Calendar:

Milestones	Expected Dates
Start of Project/Programme Implementation	April 2016
Mid-term Review (if planned)	
Project/Programme Closing	October 2018
Terminal Evaluation	December 2018

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 has been designed with the intention of implementing an integrated management model which, in the face of a cyclic scenario of climate change risks that is having an impact on the activity of breeding camelids for fiber production, provides vulnerable highland Andean communities in the Arequipa Region an alternate response model in contrast to the common recurrence to disperse efforts, and allows for a consistent and complete set of alternatives that increase climate resilience playback allows disparate efforts and provide a consistent and complete set of alternatives to increase the climate resilience of these communities and enable them to make their livelihoods sustainable.

From the viewpoint of an integrated management model, the project has been divided into two components, which are described below:

COMPONENT 2: Implementation of measures designed to strengthen community and institutional capacities for the reduction of risks associated with losses due to climate change.

COMPONENT 1

Implementation of measures designed to strengthen means of livelihood and income sources of vulnerable communities in the selected areas and implementation of complementary measures.

For the project's target areas, the Andean highlands areas of the Arequipa Region, expected scenarios of glacial retreat and changes in rainfall patterns do anticipate that threats of water scarcity are going to intensify in the future over the medium and long term, with the risk of intensified stresses due to the reduction of favorable periods of rainfall (which may be reduced from between 6 and 9 years up to 4 and 6 years) and the narrowing of the rate of return of the critical periods of rainfalls (which can vary from 6 to 9 years to 4 to 7 years). These threats extend to the consequences in a chain of resulting impacts: reduction of water available for human consumption, for sustaining the highland wetlands (*bofedales*), and, as a consequence, the reduction of their areas and the increase in the risk that some disappear, reduction in the productivity of the soil in natural and cultivated areas (such as those areas used for pasturing alpacas), a risk in the increase of overgrazing (due to the absence of adequate and available terrain), malnutrition and imbalance in the health of camelids and threat of loss of livestock, reduction in the productivity of alpaca fiber, and of its quality, as a consequence of this imbalance, threats of serious losses in the way of life derived from the alpaca fiber production in the highland areas, with a risk (that can increase over time) to the sustainability of this way of life, impacts on human health, in particular on the most at-risk population (younger than 5 years) as a consequence of the use of sources unfit for human consumption.

For these same project target areas, the scenarios forecasting an increase in extreme temperature conditions (reduction of low ranges, and increase in the high ones) generate the threat of cyclical cold waves with diverse, linked impacts: losses in the productive capacity of the soils available for sustaining the way of life derived from alpaca raising (the cold spells tend to damage, in very short periods of time, the natural and cultivated plant cover available for grazing), losses of livestock, in particular, the alpacas newborns and yearlings, due to the low resistance to the cold resulting from nutritional stress and a sharp drop in the habitat's temperature), risk of high social and economic impact as a consequence of losses in the herds which support the way of life, risk of deterioration in the exchange infrastructure (roadways) due to weather inclemency, risk of impacts on health (respiratory illnesses in particular), especially among the population younger than five (5) years of age.

The exposure to this set of risks has been generating cumulative impacts that put at risk the sustainability of alpaca breeding for their fiber production, as a way of life in the vulnerable highland Andean communities in the project's target area. Moreover, in combination with the economic stress generated by the effects of these impacts, this same population is exposed cyclically (each year) to impacts on health that these cold spells cause.

This project component is oriented to the implementation of actions for managing each one of the different risks mentioned above, with the goal of building a sustainable horizon for alpaca breeding and fiber production, in such as way that practices for the rational management of risks associated with water scarcity, reduction in grazing areas, and deterioration in human and animal well-being in the face of these cold spells can be generated.

Expected concrete outputs 1.1. Livestock and fiber production is improved with 270 alpacas shelters and health campaigns to improve the sanitary conditions of the alpacas and 72 protective fencing that are constructed.

Considering that breeding camelids for fiber production is the principal economic activity in these communities, the measures are focused on strengthening those variables which expose this economic activity the most in the face of climate variability and its impacts. As such, technically upgraded shelters will be built so that the camelids can withstand the cold spells, animal health campaigns will be held to improve the health of the animals (affected by the cold), well as to improve their resistance to the cold. Protective fencing will be installed to develop pasture rotation (a system which optimizes the recovery of vegetal cover which provides forage for the alpacas).

Expected concrete outputs 1.2. Fodder production is improved with 900 Ha of high altitude feed grains, 72 Ha of Clover sown in recovered wetlands and 72 Ha of cultivated pastures for high altitude forage and 36 high altitude wetlands recovered.

In addition, the cultivation of high altitude forage cereals, resistant to low temperatures, will be introduced. In this way, losses of the animal's foraging sources due to frost damage, one of the cold's most important impacts on economic activity, will be reduced. These measures will complement the ecological reintroduction of clover for the recovery of plant cover in the key highland wetlands that are used for grazing (the latter activity allows for improved water infiltration into the soil in these areas as well).

Expected concrete outputs 1.3. Water production and management is improved with 36 micro-dams for rainwater storage, 10,000 m of improved rural canals that permit expanding high altitude wetlands and 72 pressurized irrigation modules installed.

The sustainability of the aforementioned measures require ensuring the supply and management of water to be used both for feeding the alpacas as well as for growing fodder and for the protection and expansion of wetlands that guarantee the availability of the resource. As such, earthwork dykes will be built for storage of water from snowmelt and the short rainy seasons, existing rustic irrigation channels will be upgraded and modern pressurized irrigation systems will be installed (the latter activity also allows for the expansion of the wetlands).

Expected concrete outputs 1.4. Five (5) Community water purification systems are installed to prevent diseases.

Water management needs to be complemented by an additional measure that allows the water to be used for human consumption and have the proper potability profile in order to avoid negative secondary impacts on health (diarrhea). As such, five (5) purification systems will be installed in five critical districts.

Expected concrete outputs 1.5. Living conditions of 72 rural housing are improved with cold resistant specifications and composting latrines

The project includes the upgrade of a group of housing units, with the goal making them resistant to conditions resulting from climate variability and change. This action forms part of a comprehensive adaptation management model proposed as a model for communities and authorities (local district governments) for other future experiences. Through this activity, two (2) healthy housing units will be implemented in each of the 36 communities involved in the project so that each of the communities has a model for future experiences. This is a pilot activity that aims to educate and motivate the rural families in the community with a solution of moderate cost and affordable technology to improve their quality of life and to lend more support to this way of life.

These housing units will include a heating system consisting of solar walls (Trombe walls), electrification by an autonomous photovoltaic system, an improved stove and a composting latrine.

toPhoto: Implementation of heaters and Trombe walls, low-cost, accessible technologies.
Source: COPASA Archives

Expected concrete outputs 1.6. SAT early warning modules for rural communities are implemented.

The integrated management model also includes the installation of an early warning system (EWS) in each of these 36 communities. The expectation is that these EWS will promote the prevention and reaction actions in the communities, through civil defense committees, in the case of critical weather conditions.

Adaptation to climate change measures, with the implementation of the housing units and water purification, will have a positive impact on the health profile of the project's target communities. The formulation of an integrated management model of this kinds requires responding to one of the critical dimensions of the cyclical impact of these cold spells and shortage of drinking water (health impacts).

Indirectly the project hopes for this to contribute to the availability of fiber and to encourage those dedicated to its production to invest more time and effort, thus reducing the levels of temporary migration in search of distinct work in other areas, such as informal mining.

COMPONENT 2

Strengthening and development of community and institutional capacities for the reduction of risks associated with losses due to climate change.

The second component is oriented at promoting activities for the development of the necessary skills for effecting a culturally assimilable change in productive capacities and in the protection of human and animal well-being.

An initial group of measures is aimed at developing community awareness regarding the reduction of risks associated with economic losses caused by the weather, and at developing basic administrative skills to manage that risk. These activities will be led by competent technical personnel provided by the project.

Expected concrete outputs 2.1. Community awareness regarding climate risk reduction and capacity building: 1. conformation of civil defense committees; 2. Educational competitions; 3. training of heads of households; 4. Training workshops and fieldwork days on technical subjects.

- Advice and monitoring will be provided to processes for strengthening district and community civil defense committees, for their review and implementation.
- Educational Innovation Competitions will be held covering environmental and climate change themes, in coordination with local education districts and schools.
- Field days will be held under the 'learning by doing' modality for the development of skills in modern irrigation techniques, handling and upkeep of forage grains, associated grasses, clover in high altitude wetlands, animal care and health, shelter construction,

improvement of rural Andean highland dwellings with solar wall heating systems, the installation of stand alone photovoltaic panels, composting latrines and improved stoves.

Expected concrete outputs 2.2. Preparation of technical guides on: 1. adaptation to climate change; 2. use of the early warning system; 3. adaptation and risk prevention for educational institutions; 4. Livestock production, fodder production water production and management and family housing improvement.

- Technical guides will be produced about adaptation to climate change in the context of environmental risks.
- Technical guides will be produced for in the field workshops on the handling and operation of early warning systems in educational institutions, providing training on adaptative techniques and practices which shape the planting of forage cereals, cultivated fields, installation of irrigation technology, high altitude wetlands management, animal health, construction of shelters, and the improvement of family dwellings.

A second group of measures comprises the activities of developing specific and alternative skills to strengthen the raising of alpacas and fiber production. The community members will be trained in these techniques for the installation, the use, and the care of resistant feed grains, shelters for alpacas, clover in high altitude wetlands, irrigation equipment, grasslands; for the care and management of animal health under conditions arising from climate risk; for the improvement and protection of high altitude wetlands.

Expected concrete outputs 2.2. Capacity building complementary activities: 1. Workshops for 5 teams (assessment of damages and needs analysis); 2. Prevention plans and training for educational institutions; 3. Training workshops for municipals authorities and community leaders; 4. Disaster simulations at the district level.

- Municipal officials, community representatives, prioritized educational institutions, heads of households will be trained in the diagnosis of dangers, vulnerabilities, interactive maps, prevention plans, community focus on topics related to adaptation to climate change, risk management, and environmental protection. Workshops will be held for the formation of five basic teams for damage assessment and needs analysis at the district level, including the staging of disaster drills.
- Some of the skills development activities will involve jointly community leaders and authorities: workshops for the establishment of teams for damage assessment, climate change risks management and the elaboration of a long term strategy for climate change risk management and its dissemination.

About the beneficiaries and the scale and combination of the activities:

The number of beneficiaries will be defined on the basis of a census available with the local authorities SIFHO[25] (Sistema de Focalización de Hogares, Household Targeting System). Such

[25] The SISFOH (System of Household Targeting) is a fundamental tool for responding to the needs of social information. To this end, it has an information system about socioeconomic characteristics of households, called General Registry of Households (PGH, for its acronym in Spanish). In this context, the focus is the means by which State subsidies are assigned to the most needful and vulnerable families. The most recent information obtained from the SISFOH is from 2014. The census results can be found at: http://www.sisfoh.gob.pe

survey identifies their living conditions, including the poverty levels; on the other hand their willingness to actively participate in the project will be also verified, giving priority to female heads of household mothers. Based on that census and on previous contacts with the communities, the scales of the activities have been determined, giving priority to the more extreme poverty levels.

The activities will be performed transversely, combining different themes and in a playful way to spark the interest of the peasants, considering they are not used to theoretical sessions, but rather practical activities; therefore the methodology uses learning by doing and training materials produced in a playful manner they find most attractive and appealing.

Long-term adaptive management and dissemination strategy

Training activities are dynamic, based on training in action processes and focused on the identified production interests of the peasants. In addition, working with the *Yachachiqs* forms a central part of the plan, who are expert local farmers, to communicate the techniques and cultural support.

On the other hand, it is planned to make agreements with local governments to incorporate in their monitoring activities the follow up of the project, and to replicate the models developed in the project. Other areas where the experience could be replicated are: Puno (region with the major alpaca fiber production), Cuzco, Tacna and Moquegua.

In consideration of common characteristics of the geographical environment (the *puna* ecosystem) and the ancient practice of raising camelids for their fiber and other purposes, the project's possible replication is expected in other regions of Peru, as well as other countries that share the highland ecosystems and the ancestral practice of raising camelids and use of their fiber. These countries are Bolivia, Chile and Argentina. Just as the conditions for social and economic development are similar, the high probability of project replication is anticipated and/or transfer of experience and specific knowledge developed during the course of the project.

As project follow up strategy, these activities are foreseen: 1. Project impact evaluation (about six months after the end of the project); 2. Indicators follow up (at least one year after the end of the project); 3. A follow up budget allocation to be negotiated with the local governments; 4. periodic visits by COPASA, after the end of the project (to be negotiated).

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

This Project focuses its attention on Andean Highland communities in the provinces of Arequipa, Caylloma, Castilla, Condesuyos and La Union, located in the Arequipa Region, whose sole possible activity is alpaca breeding and high altitude crops, in large measure under the responsibility of women as a consequence of male migration in search of labor. The intervention will focus its gender efforts to propose a women involvement in the making decisions processes as well as in training events, because although male migration is important, women's participation in decision-making is still limited. It is necessary to settle upon

appropriate strategies to promote and enhance the capabilities and skills of women in different manners, both productive and social.

The women participation model will be explicitly maintained throughout all the project activities. To make it sustainable beyond the project, both the project follows up and the follow up and replication agreements with the local authorities will include a section dealing with this subject.

Environmental Benefits:

The water management activities of the project will allow the recovery and expansion of the wetlands in the project area and will increase the conservation and improvement of the pastures. In addition, the expansion and preservation of the planted areas will reinforce this last aspect. Consequently, in the areas of project, the soil is going to be preserved, and the land degradation en erosion processes will be avoided while the carbon stock in those soils will increase. To make sustainable this reduction of climate change impacts the monitoring and follow up of the project results will be essential.

Recovering high altitude wetlands optimize their water infiltration capacity and the renovation of the stock of natural pastures.[26] High altitude paramo, *puna* and *jalca* wetlands are not isolated bodies of water but complex systems, and are, thus, essential to micro-basin dynamics.

In addition to being important as water sources, high altitude Andean wetlands are also essential habitat components for camelids of economic and ecological importance such as vicuña, guanaco and chinchilla. High altitude Andean wetlands are considered by the Ramsar Convention as ecosystems of great fragility associated with natural causes such as climate change, prolonged drought in the highlands and human intervention. With the wetlands recovery, the project will improve and will help to make sustainable the complex environmental services these systems offer.

The use of irrigation systems, with the incorporation of handling enclosures, in abiding with ecological features of the natural surroundings and the population's cultural characteristics, increases the productive capacity of the forage cover, as it preserves it from the processes of erosion and desertification.

Note: The water infrastructure we propose is innovative at high altitudes, avoiding negative impacts that may be associated with larger infrastructure, since it is small-scale appropriate infrastructure that is also natural resources management.

Social and Economic Benefits:

As explained in section C, considering direct and indirect beneficiaries, the implementation of the project may avoid, over 5 years, the losses of about 140.000 alpacas and vicuñas heads, corresponding to prevent losses in revenue from an order and $ 2.8 million (USD) per year. An indirect consequence of such economic benefits could be the reduction of migration effects.

The project directly benefits 68,848 inhabitants in the highland provinces of Arequipa, Caylloma, Condesuyos, Castilla and La Union. It is aimed at meeting the needs of people living in extreme

[26] Andean Highland Wetlands: Regional Strategy: RAMSAR or The Convention on Wetlands of International Importance

poverty, according to the Human Development Index (HDI), the targeted populations are located at 0.5219 and 0.5658 on the HDI place which is below the national average of 0.598.

The project will contribute to improving the quality of life of this population, by avoiding a worsening in the rural poverty in the highlands of the Peruvian Andes due to the negative effects of climate change. Effects such as the reduced availability of flows in springs and more irregular rainfall, both central to the sustainability of livelihoods obtained from high altitude livestock and dry farming, will be alleviated. The technologies that we propose to implement in the project will enable greater resilience to climate change, as much for their positive effect on income as for the cost savings gained from reducing negative impacts on health and livestock.

Beneficiaries

We have selected five (5) of the most remote provinces and 18 districts in the highlands (at elevation ± 3,800 masl), where the effects of climate change and the lack of any focus on risk management and adaptation are evident. These provinces have a total population of 240,467 inhabitants in their rural areas, characterized by extreme poverty and vulnerability to the effects of climate change, with scattered populations, of which the project will benefit 68,848 beneficiaries directly. The direct beneficiaries comprise 28.63% of the Arequipa region's total population, while the remainder will benefit indirectly. (See Table 12).

Table N° 11

DEMOGRAPHIC DATA IN THE AREQUIPA REGION					
Population-Arequipa Region					**1,259,562**
(Residents)					**Inhabitants**
PROVINCE	**URBAN (Residents)**	**RURAL (Inhabitants)**	**% Selected**	**SELECTED POPULATION (Head/Household)**	
Province-Arequipa	868,922	78,862	7.16%	5,645	
Province-Caylloma	0	89,042	7.16%	6,373	
Province-Castilla	0	38,887	7.16%	2,783	
Province-Condesuyos	0	18,340	7.16%	1,313	
Province-La Union	0	15,336	7.16%	1,098	
Province-Camana	57,776				
Province-Islay	52,914				
Province-Caraveli	39,483				
TOTAL	1,019,095	240,467		17,212	
Percentage	80.91%	19.09%			
Total Covered by the project (Each head of household represents an average of 4 members)				68,848	
Percentage of population attended directly by the Project				28.63%	
Percentage of population attended indirectly by the Project				71.37%	

Source: National Institute of Statistics and Computing-INEI (acronym in Spanish). **Chart:** Provided by COPASA Arequipa

Selected Project Areas:

Based on the analysis of vulnerability in each of the provinces, taking into account remoteness, poverty levels, and climate impacts, the following most vulnerable districts were selected: San Juan de Tarucani, Chiguata, Polobaya, Pocsi and Quequeña, with a total population of 8,471 inhabitants.

In Caylloma, which has twenty districts, the most remote districts have been selected: San Antonio de Chuca, Sibayo, Callalli and Tuti; with a total population of 5,164 inhabitants.

Castilla, which has fourteen districts, of which the districts in the highest elevations, such as Orcopampa, Andagua, and Chachas, have been selected; with a total population of 12,373 inhabitants.

Condesuyos, which has eight districts, of which the districts of Chuquibamba, Andaray and Yanaquihua have been selected, being those that contain elevated poverty indices; with a population of 9,271 inhabitants.

La Union, which has eleven districts, of which those that are found in the most elevated areas have been selected: Pampamarca, Huaynacotas, and Puyca; with a population of 6,484 inhabitants (See Table 13).

Gender Issues as an additional project benefit

Given that project activities involve frequent interaction with community members, the promotion of and requirement of women's participation in training events/ field days, and in the actions the community may establish to cushion the effects and ravages of natural disasters that seriously affect their lives and their natural resources will be a central guideline for group activities. This guideline will be oriented in particular at motivating an openness among the men in accepting women's participation.

A more decisive and committed involvement in the organization and decision-making considerations for taking on aspects of risk management will be promoted among men and women.

The development of skills and capacities will be encouraged and emphasized in the project activities (both productive and social), due to the fact that it is they who are dedicated mainly to alpaca breeding and feeding activities, due to the frequent absence of the men as a consequence of the search for other sources of income.

The strategies used to engage the various stakeholders convened by the project is the use of local mass media outlets and convocations seeking the participation of regional and local authorities.

The project will prioritize the outreach to and the participation of women with leadership profiles, so that they become promoters in support of other women and mobilizing agents for promoting actions that drive economic activities and others related to adaptation to the impacts of climate change.

Photo. Women working in various activities. **Source:** COPASA Archives-2012

Other socioeconomic benefits, the quality of alpaca fiber

In building a panorama of sustainability for alpaca breeding, the enhancement of fiber quality occupies and important place, insofar as its quality, besides adding value to the product (which benefits the entire productive chain), contributes another variable favoring sustainability because it positions its better in the face of demand, both nationally as well as internationally, both for the production of fiber as well as goods made from it.

This project can have an positive impact on the quality of alpaca fiber to be produced, insofar as it will have an effect on three parameters of the alpaca raising: the quality of animal nutrition, the health of the alpacas and sheltering of animals in the face of exposure to inclement weather, such as intense rainfall which can impair the growth of high quality fiber. The project will not focus on other parameters that influence fiber quality.

Management of Environmental Impacts in Compliance with the Environmental and Social Policy of the Adaptation Fund

The project has been categorized as **Category B** as a result of CAF´s screening performed to identify potential environmental and social impacts and risks of the project. According with the Adaptation Fund Environmental and Social Policy Statement (Approved in November 2013), and considering that the Project´s Environmental and Social Assessment, to be executed by CAF as Implementing Entity, represents a minor part of the project, and that the inclusion of the assessment report in the proposal has not been feasible, Project´s Environmental and Social Assessment, as well as its corresponding Environmental and Social Management Plan and Monitoring, Reporting and Evaluation Plan will be delivered to the Adaptation Fund Secretariat as soon as the assessment is completed.

During project implementation, CAF's annual project performance report will include the status of implementation of the Environmental and Social Management Plan and also of any corrective actions that had considered necessary to avoid, minimize, or mitigate environmental and social risks. On the other hand, CAF´s project mid-term and terminal evaluation reports shall also include an evaluation of the project performance with respect to environmental and social risks.

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

Expected concrete outcome 1.1. Reduce vulnerability to herd mortality and strengthening livelihoods and sources of income for vulnerable people in selected areas.

Expected concrete output 1.1, constructon of shelters for alpacas, Alternative 1, Alpacas shelters, Intervention by the Ministry of Agriculture in order to achieve the same outputs. Utilizing a centralized and distant administrative structure, the MINAG (Ministry of Agriculture), in an intervention carried out in highland alpaca raising areas, during 2006 and 2007, built 2016 shelters for camelids with a budget of USD 2,933,000, with a per shelter cost on the order of USD 20,350.

Expected concrete output 1.1, constructon of shelters for alpacas, Alternative 2, Alpacas shelters, Project Intervention. The project proposes to build 270 shelters, within the context of

group activities, the total cost of which is USD 619,400. In the project, under the group activities cost, the per unit cost of each shelter comes out at USD 2,295, a per unit cost 8.8 times lower than the alternative of repeating the centralized intervention by the Ministry of Agriculture. Additionally, under the project's cost projection for this item are included the construction of 72 enclosures under the same set group activities, which demonstrates that the project's cost-effectiveness is much superior to Alternative 1. It is difficult to conceive another intervention outline not originating from the State, given the social complexity and investment levels. For this reason, there are not other precedents of other kinds of alternatives to achieve the same outcomes

Expected concrete output 1.2, Forage production, Alternative 1, Intervention by the Ministry of Agriculture with traditional forage.

With traditional forages the expected output is 40 MT/ha[27], while the cost of planting per hectare is USD 307. In order to estimate losses, with this type of forage, the calculation done by the FAO[28] was employed, which generated in the case of Arequipa an annual loss of 48.8%. As such, the cost of producing a metric ton of this forage (compensating for the losses due to frosts produces a correction factor for loss equal to 1.4848):

USD 307/ha planted/ (40 MT vegetal matter/ha planted) * 1,4848 = USD 11.40 /MT veg. matter

Expected concrete output 1.2, Forage production, Alternative 2, Project Intervention with resistant forage.

With resistant forage, the expected output is 80 MT/ha while the cost of planting per hectare is USD 900[29]. With this type of forage it is hoped to eliminate the costs of cyclical losses due to frost. As such, the cost to produce a ton of this forage:

900 USD/ha planted / (80 MT vegetal matter/ha planted) = USD 11.25 / MT veg. matter.

In the project outline, each year's production will allow for the recovery of seed for the following season. Incorporating this advantage to the cost estimate for producing a metric ton of forage for the second season will be USD 625/ha[30] less:

(900-625) USD/ha planted / (80 MT vegetal matter/ha planted) = USD 3.35 / MT veg. matter.

It can be noted that the project outline is more cost-effective beginning the second planting season, while the first planting shows a slight advantage in cost effectiveness in comparison to the production of traditional forage.

[27] For the comparison, in the case of traditional forage, we used the calculation model proposed by Félix Hurtado Huamán in "A Model for the Sustainable Management of Natural Resources in Highland Ecosystems" (*Un modelo de manejo sostenible de recursos naturales en ecosistemas de alta montaña*.) Soluciones Prácticas. Lima, July 2010. See Table 50 in the addenda section. The author's calculation was developed for the Canchis Province in the Cusco Region.

[28] Impact Analysis of Frost Events (friaje) 2008 in Andean highlands agriculture and livestock in Peru. FAO Emergency Coordination Unit, FAO Representative in Peru. 2008. Available at http://www.fao.org/fileadmin/user_upload/emergencies/docs/Peru_ESTUDIO_FINAL_FRIAJE_OCT_13_2008.pdf

[29] Commercial information from the seed providers.

[30] Commercial information from the seed providers.

Expected concrete outcomes 1.3 and 1.4. Reduce vulnerability to water scarcity and strengthening livelihoods and sources of income, and enhance adaptive capacity to water scarcity that affects health.

Expected concrete outputs 1.3 and 1.4, Water Production and Managment, Alternative 1, Provision of water for irrigation and for human consumption via a system of aqueducts and water management for irrigation with 72 pressurized irrigation systems, and five water treatment systems

Although detailed estimates for the project have not been done, traditional infrastructure construction necessary for the provision of water via aqueducts to deliver water to the Andean highland areas in these provinces of the Arequipa Region considered as project objectives would have a cost above USD 50 millones, or even USD 100 million were the cost of water treatment systems for distributing drinking water taken into account.[31]

Also, the cost of irrigation systems would have to be added to the infrastructure development, a cost which is constant in the two alternative.

Expected concrete outputs 1.3 and 1.4, Water Producción and Managment, Alternative 2, Project Intervention through water provision for irrigation and for human consumption via 36 micro-dams for rainwater storage, 10,000 m of improved rural canals that permit expansion of high altitude wetlands and 72 pressurized irrigation modules installed and five water treatment systems

In the project framework, the infrastructure costs are substituted by the costs of reservoirs (which together constitute 0.2% of the cost estimated for aqueducts), while the same costs for irrigation systems are maintained (USD 252,000). Additionally, the costs of 5 water treatment units are added.

The AYNINAKUY Project proposes to carry out similar irrigation systems with 100 m3 reservoirs at a cost of USD 3,500.

With the per unit costs of the project, the irrigation systems, including the reservoirs, will have, for 72 hectares, a cost of USD 252,000. The five water treatment systems will have a cost of USD 175,000. Also, the cost estimated for the improvement of canals for water distribution is USD 40,000. The budget for the set of activities comes to USD 457,000, an expenditure far below the budget required for an aqueduct infrastructure buildout (corresponding to 1% of the other alternatives projected budget).

NOTE: The costs found in different pressurized irrigation systems solutions for Andean highland areas all remain within a narrow range. It is to be expected that the costs vary slightly as a function of topograpical conditions and other specific variables of each project. Below are shown various examples:

Per Unit Costs of Some Pressurized Irrigation Systems in Andean Highlands

[31] The Central Bank of Reserve of Peru estimated, for 2013, an average of USD 233 million for public-private investments in infrastructure. See: Public-Private Partnerships (PPP) as an investment alternative in public infrastructure, Lima, April 2013. Available at: http://www.bcrp.gob.pe/docs/Publicaciones/Seminarios/2013/app-2013/app-2013-hinojosa.pdf

Executor	Includes reservoir?	Reservoir volume	USD
Asociación Proyección[32]	Yes	23m3	1,566/module
NGO *Tadepa*[33]	No	__	1,200/ha
Plan Meris II[34]	No	__	1,600/ha
Soluciones Prácticas[35]	Yes	23m3	1,402/ha
Soluciones Prácticas (estimate)	Yes	100m3	4,800/ha
Project	**Yes**	**100m3**	**3,500/module**

It can be noted that the per unit cost is established per hectare and in others per module.

Expected concrete outcome 1.5. Enhance adaptive capacity to extreme variations of temperature and hygiene conditions

Expected concrete output 1.5, Improving of living conditions of 72 rural housing, Alternative 1, Provision of pre-fabricated houses and of solar electrification, composting latrines and improved stoves.

There are prior experiences of low cost interventions in order to offer family housing conditions adapted to the new temperature fluctuations in the Andean highlands. In 2012, in the Puno Region, 100 "warm homes" were implemented at a per unit cost of USD 1,500 to 1,700.[36]

The provision of solar electrification, composting latrines and improved stoves budgeted by the project would have a per unit cost of USD 2,000, which would bring the per unit cost of this kind of intervention (without updating the cost of the 'warm houses') to between USD 3,500 and 3,700.

Expected concrete output 1.5, Improving of living conditions of 72 rural housing, Alternative 2, improvement of existing housing through the implementation of Trombe

[32] *Asociación Proyección*, Arequipa, Peru, 2009. Available in hard copy in COPASA archives.

[33] Intermón Oxfam, *Tapeda*'s Assessment Report, 2009. Available in hard copy in COPASA archives.

[34] (Iproga, GIRH Course, 2009). Available in hard copy in COPASA archives.

[35] The lead researchers are Karin Bartl and Carlos Gómez, from the UNALM (National Agricultural University La Molina, Lima, Peru). Contact addresses for these researchers are: k_bartl@hotmail.com and cagomez@lamolina.edu.pe.

[36] Information reported in Bill 2672/2013 CR. Disponile en http://www2.congreso.gob.pe/Sicr/TraDocEstProc/Contdoc02_2011_2.nsf/d99575da99ebfbe305256f2e006d1cf0/80afdb570bb343e405257be9007d60b6/$FILE/PL02672170913.pdf

walls and the provision of pre-fabricated houses, solar electrification, composting latrines and improved stoves.

Trombe wall technology allows for the transformation of a house's thermal environment through the implementation of the wall in one of the dwelling's sides, together with improved seal at the windows and doors.

According to project estimates, it is possible to achieve the implementation of these Trombe walls, in the project's target communities, at a per unit cost of USD 500, a cost whose main component is derived from the purchase and transport of glass materials from an urban area. As such, a heated environment solution can be made available at a cost which reduced to almost a quarter of that required by the implementation of a 'warm house'.

In this way, the cost of the Trombe wall along with the solar electrification, composting latrines and improved stoves, for the project, would have a per unit cost of USD 2,500 (USD 2,000 + USD 500). This outline reduces the cost of alternative 1 by almost 72%.

Expected concrete outcome 1.6. Reduction of regional exposure to the dangers and threats related to the climate by enhancing adaptive capacity to cold spells (*friajes*) that affects health

Alternative 1, early warning module that includes a digital hydrometer, thermometers, rain gauge and a small weather station cabinet, and the transmission of weather reports via shortwave radio, with a cost of USD 2,350 for each EWS module.[37]

Alternative 2, project intervention, a simplified framework was chosen for the project which includes a digital hydrometer, thermometers, rain gauge and a small weather station cabinet and the transmission of weather reports via celular telephone (included in the module), with a cost of USD 600 for each EWS module, at a cost of 25% of Alternative 1 with shortwave radio.

In this way, the per unit cost for each EWS comes to USD 600, a competitive price in comparison to other low cost solutions implemented in other Andean highland areas, as is the case propoesed by *Soluciones Prácticas* in Sicuani, Cusco (Peru), in which the per unit cost is USD 2,350 per EWS (this included short wave radio equipment).

Expected concrete outcome 2. Improved awareness regarding adaptation, climate risk reduction and community capacity building.

For the implementation of skills development activities, the project proposes a framework based on reliance on local technicians, along with a central role being played by the *Yachachiqs* for skills development activities directed exclusively at the members of these communities.

The intermediation of the *Yachachis* has been an experience proven and originated in lessons learned by COPASA. The framework allows for the effective ownership of skills and information, thanks to the fact that they are validated, mediated and regulated by a community member of recognized stature as regards knowledge and its transmission. Trust and clarity in communication that this mediator offers contributes in an important way to the effectiveness of the skills development and their incorporation in their productive culture.

[37] *Asociación Proyección*, Oxfam America and Oxfam International. Guide for Training in Early Warning Systems. *Proyecto Raíz Comunal*. Arequipa, 2005. *Asociación Proyección* and Oxfam America. Guide for the Implementation and Monitoring of EWS. *Proyecto Anta Pacha*. Arequipa.

Although the effectiveness value provided by the *Yachachiq's* role in the project to skills building is highly meaningful, it also contributes to reducing the costs of having an outside expert present, given that the *Yachachiq* lives in the area, and for this obtaining his or her participation is substantially less costly.

It is important to highlight that the *Yachachiq* support framework also requires the participation of specialist technicians, even though it reduces the intensity of their presence. The framework has already been utilized successfully in other projects carried out by COPASA.

The project seeks to create within target communities resource appropriation skills in order to manage the impacts of cold spells. Thus, the project, instead of delivering shelters built by foreign technicians to manage the emergency, aims at empowering communities in the construction and maintenance of technically improved alpaca shelters. In this same vein, the project will provide training in the streamlined management and optimized use of grazing areas. The autonomy the project seeks to instill in the affected communities arises from an interest in ensuring that the management of cold spell impacts are appropriate for the community, which will contribute to the long term sustainability of the results. With this, the project offers the prospect of avoiding or reducing in future significant costs arising from reactive actions common to the centralized government's response model (Alternative 1).

There is another aspect that reinforces the cost-effectiveness of the project: The Special Project COPASA has been developing capacity for several years and the capitalized experience is a starting point that prevents costs arising from typical preliminary contacts and surveys of information in each project. In particular, the knowledge management strategy does not require the preliminary investigation stage, and therefore, the planned activities are based on knowledge of the communities and the experience of prior interaction with them.

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

Alignment of the project with the institutional and policy framework at regional (subnational) level:

The Regional Strategy for Adaptation to Climate Change in the Arequipa region 2008-2018 states:[38]

The Strategy includes among its axes, number 6.2. Strategic axes:

1. Climate Change Policy, inserted in the Regional Development Plans and Local Governments.

3. Protection of biodiversity and water sources.

[38] http://www.regionarequipa.gob.pe/arma/index.php?option=com_content&view=article&id=1168&Itemid=473

file://servidor/Users/proyectos/Mis%20Documentos/Downloads/estraregcambli.pdf

5. Training, awareness and dissemination at all levels.

In the development of this axis, the strategy proposes the following objectives:

- **6.3.3. Protection of biodiversity and water resources** The Arequipa Region needs to implement in a prioritized manner a Special Program for the protection of water resources, including the development of harvesting strategies and sustainable water management,

- **6.3.6. Validate adaptation measures** The development and validation of adequate adaptation measures for the livestock sector, with the involvement of the same rural breeders is equally another strategic option.

The project activities related to cultivation and rationalized use of water (water conservation and improvement of high altitude wetlands in use) will develop these two objectives, 6.3.3 and 6.3.6.

The Concerted Development Plan 2013-2021 of the Arequipa Region.

The Plan's General Objective, "Natural Resources and protected, recovered and sustainably utilized environments", is developed in the following specific objectives:

1. Conservation and sustainable use of natural resources and biological diversity.

2. Integrated and efficient water and regional basins management.

3. Adequate environmental quality absent ecosystem encroachment and recovery of degraded environments.

4. Consolidate Environmental Governance, a high level of awareness and environmental culture, and active citizen participation.

5. Eco-efficient and competitive development of the private and public sectors, promoting economic and environmental potentialities and opportunities.

With the goal of developing the former objectives, in the Plan the following strategies have been designed:

• Drive the integrated management of basins prioritizing the conservation of the headwaters' of the basins, and the sustainable use of water resources and soil for social well-being.

• Drive the implementation of water seeding and harvesting projects in the highland areas of the region for the improvement of productive activities and as measures for climate change adaptation and environmental risks.

• Drive measures for the improvement and conservation of natural pastures, wetlands, and high altitude wetlands, achieving their sustainable use and avoiding overgrazing or the intromission of activities (mining, construction, etc) which lead to their destruction.

• Strengthen the weather monitoring system through hydrological and meteorological stations and by implementing an early warning system to prevent environmental risks.

The project's central activities are framed within the former objectives and strategies:

- In their goals and focus, the activities related to the strengthening of alpaca breeding as an economic activity (Component 1) develop the specific objective 5. (Eco-efficient and

competitive development of the private and public sectors, promoting economic and environmental potentialities and opportunities).

- Activities related to the harvesting and rational use of water (water conservation and improvement of high altitude wetlands in use) develop specific objectives 2 (Integrated and efficient use of water and regional watersheds) and 3 (Adequate environmental quality absent ecosystem encroachment and recovery of degraded environments), as well as the second strategy (Drive the implementation of water seeding and harvesting projects in the highland areas of the region for the improvement of productive activities and as measures for climate change adaptation and environmental risks), and the third strategy (Drive measures for the improvement and conservation of natural pastures, wetlands, and high altitude wetlands, achieving their sustainable use…).

- Activities related to rationalized use of pasturing areas also develop the specific objective 3 and the third strategy mentioned above.

- The manner in which the skills development activities are anticipated (with the active participation of the communities) develops objective 4 (Consolidate Environmental Governance, a high level of awareness and environmental culture, and active citizen participation).

- Activities related to the implementation of early warning modules develop the fourth strategy enumerated above: Strengthen the weather monitoring system through hydrological and meteorological stations and by implementing the early warning system to prevent environmental risks.

Relationship with National Policy

The AYNINAKUY project is aligned with the following national policies, plans and priorities for sustainable development and adaptation to climate change (including national guidelines):

1.- **NATIONAL STRATEGY FOR FACING CLIMATE CHANGE (ENCC), approved by Executive Order Nº 011-2015-MINAM**

In its vision for 2021, Peru is adapting to the adverse effects of climate change, and takes advantage of the opportunities imposed by climate change, establishing the basis for a low-carbon, sustainable development.

In the first of its strategic objectives, “The population, economic agents and the State increase awareness and adaptive capacity for actions in the face of climate change’s adverse effects and opportunities.” The project aligns itself with three of the indicators defined for this strategic objective: 1. An increase in the proportion of persons whom know what actions to take for managing risks in the context of climate change and for adaptation in the face of climate change. 2. An increase in private investment and in the quality of public spending for adaptation to climate change. 3. A reduction in the loss of human life, and economic losses due to disasters arising from climate variations.

2.- The “BICENTENNIAL PLAN, PERU 2021”

With regard to soil, Axis Six of the Plan indicates that desertification, defined as the process of land degradation in arid, semi-arid and dry sub-humid areas resulting from various

factors, such as climatic variations and human activities, constitutes a high priority environmental problem in the country.

On the other hand, under the rubric OBJECTIVES, GUIDELINES, PRIORITES, GOALS, ACTIONS and STRATEGIC PROGRAMMES, point C of the PRIORITIES notes what category should be prioritized: 1. Sustainable use and management of natural resources. 2. Improving environmental quality (air, water and soil). 3. Ensuring adequate water availability throughout the country. 4. Adapting the country to climate change. 5. Implementing the National Environmental Management System.

In conjunction, the project develops the aforementioned article of axis 6: deal with, preferentially, soil degradation resulting from climatic variations. Likewise, the project responds to the prioritization that the Bicentennial Plan accords ensuring the adequate availability of water, and climate change.

3.- National Environmental Action Plan - Peru 2011-2021 **PLANAA**

Prioritized goals. GOAL 6

6.5.-conservation and sustainable use of ecosystems and genetic resources (Camelids)

Goal No. 5 - Forests and Climate Change the following: (See Table 14).

The State has developed the Multisector Plan against frost and cold fronts, which aims at articulating multisector efforts for prevention and risk reduction during frosts and the cold season of 2015, as well as preparedness activities; developing Government intervention strategies, designed to intervene in those critical areas where the population is highly vulnerable and that given their geographical location, the state's presence is weak; with the goal of protecting the life and physical integrity of the local population and their livelihoods. This nation-wide plan is in keeping with the implementation of the programme in an area that needs large amount of support.

In conjunction, the project is consistent with the Multi-sector Plan, and as such corresponds to an intervention strategy focused on prevention and risk reduction in face of cold spells. Below are the projections established by this Multi-sector Plan:

Table N° 12

Strategic Action	GOAL FOR 2017	GOAL FOR 2021
Estimate and reduce vulnerability in the face of climate change.	Vulnerables areas in the face of climate change at the regional and national levels, identified	Vulnerability has been reduced and/or adaptation capacity in the face of climate change has been increased at the local, regional and national levels.
	Responsible entities: RG, LG, MEF, MINAM, MINAG, MVCS, MINEM, MINSA MINEDU, PRODUCE. [39] Co-Responsible entities: ANA, SENAMHI,	

[39] RG: Regional Government, LG: Local Governmentl, MEF: Ministry of Economy and Finance, MINAM (Spanish acronym): Ministry of the Environment, MINAG: Ministry Agriculture, MVCS (Spanish acronym): Ministry of Housing, Construction and Sanitation, MINEM: Ministry of Energy and Mines, MINSA (Spanish acronym): Ministry of Health, MINEDU: Ministry of Education, PRODUCE (Spanish acronym): Ministry of Production.

Strategic Action	GOAL FOR 2017	GOAL FOR 2021
	INDECI, National Commision on Climate Change and like entities at the regional level, Businesses, Civil Society.	
Develop and implement Regional and Local Strategies of Adaptation and Mitigation in the face of Climate Change.	50% of regional government develop and implement strategies of adaptation to and mitigation of climate change.	100% of regional governments develop and implement strategies of adaptation to and mitigation of climate change.
	Responsible entities: RG, MINAM. Co-Responsible entities: MINAG, SENAMHI, IGP, LG, Universities, Businesses, Civil Society. [40]	
Reduce land and soil degradation 118 and, as well as increase the capacity to mitigate the effects of drought.	The area of degraded soils has been reduced by 30% in relation to the updated baseline. – Early Warning System for Drought, implemented. –The area of zones affected by drought have been reduced by 5%.	- The area of degraded soils has been reduced by 50% in relation to the updated baseline. - The area of zones affected by drought have been reduced by 20%.
	Responsible entities: MINAM, MINAG, SENAMHI, ANA, RG, LG. Co-Responsables: MEF, MINEM, PRODUCE, CONCYTEC, IGP, National Commission for the Fight against Desertification, Unions, Businesses, Civil Society. [41]	

Source: Multi-sector Plan in the face of Frosts and Cold Spells 2015 [42]

The project will be executed by the COPASA (acronym corresponding to Special Project of the Regional Government of Arequipa), **institution** responsible for the Integrated Rural Development Program, with a focus on Disaster Risk Management and Adaptation to Climate Change, aimed at the rural poor and those in extreme poverty.

Projects executed by COPASA possess the category of Special Project, which facilitates the execution of projects in a fast, versatile and autonomous manner.

Intended nationally determined contribution (INDC) from the Republic of Peru

The Peruvian iNDC[43] (September 2015) defines the following sector priorities in adaptation:

i. Water (Water resources)
ii. Agriculture
iii. Fishery
iv. Forestry
v. Health

[40] SENAMHI (Spanish acronym): National Meteorology and Hydrology Service of Peru, IGP (Spanish acronym): Geophysical Institute of Peru, Universities, Businesses, Civil Society

[41] ANA (Spanish acronym): National Water Authority, CONCYTEC (Spanish acronym): National Council on Science, Technology and Innovation, National Commission for the Fight against Desertification, Unions, Businesses, Civil Society.

[42] http://www.pcm.gob.pe/wp-content/uploads/2015/07/PLAN-MULTISECTORIAL-ANTE-HELADAS-y-FRIAJE-2015-10.06.2015.pdf

[43] United Nations Framework Convention on Climate Change (UNFCCC).

The mentioned iNDC defines, as vulnerable populations to be addressed on a priority basis, the following: rural populations related to subsistence family farming and/or weak market linkages, many of them grouped in peasant and indigenous communities; small farmers; artisanal fishermen; native communities; small forest producers; and, from a health perspective, infants, women and seniors.

For each one of the priority sectors enumerated above, the INDC has defined scopes, objectives and goals. For the project these are pertinent in the sectors of health and water. Below are the scope and intermediate objectives defined for these two sectors:

- Water Sector
    - Scope: Includes supply (resources) and demand (use): direct human consumption, agriculture and livestock, energy, mining and industry. It includes physical and eco-systemic infrastructure.
    - Intermedate objectives: Encourage and promote actions and projects that increase the availability of water in the context of CC.
- Health Sector
    - Scope: Considers increasing the adaptive capacity of health services in order to face CC, and the resilience of vulnerable populations to its effects.
    - Intermedate objectives: Reduce vulnerability and increase the population resilience to the health effects of climate change.

In addition to the prioritized sectors, the iNDC has defined five crosscutting areas. The goals of two of them are related to the project objetives and activities:

- Poverty and Vulnerable Populations Approach goals: Increase the number of programs and instruments against poverty that incorporate adaptation to climate change.
- Gender and Intercultural Approach
    - Formulation and approval of the Action Plan on Gender and Climate Change
    - Encourage the participation of indigenous organizations in actions on climate change

E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.[44]

[44] LEGAL REGULATIONS THAT GUIDE THE EIS (Environmental Impact Study; Spanish acronym-EIA):
- Law Nº 28611, General Law on the Environment.
- Law Nº 28245, Framework Law of the National Environmental Management System.
- Law Nº 27446, National System for the Assessment of Environmental Impact Law.

The environmental impacts of the project activities are expected to be minimal. Therefore EIA (Environmental Impact Assessment) and water protection specific regulations will not be applicable. The construction activities will be also minimal and hand made, and they will have low environmental impact; consequently no specialized building codes will be applicable.

To comply with the Environmental and Social Policy of the Adaptation Fund, a CAF environmental officer, to verify if all the E&S applicable AF's principles are well managed by the project, shall conduct an environmental and social evaluation. Findings of this evaluation shall be solved by mitigation or management actions/solutions described in an E&S Management Plan for the project, defined by the CAF responsible environmental officer (to be complementary to any other E&S management plan existing and applicable to the project).

Normally, the CAF Environmental officer responsible of formulating such plan, shall visit the project Area and interview both the project proponent and the communities representatives.

For the project implementation phase, the project proponent shall designate an officer responsible for the E&S Management Plan implementation, monitoring and reporting. A CAF Environmental officer CAF will review the periodic reports of the implementation and monitoring of the E&S Management Plan, and if he/she considers it adequate, the necessary additional request or verification visit shall be executed.

NOTE: At the end of the document a list of minimal environmental impacts is shown, to demonstrate that such impacts are minor.

COPASA for the Self-sustaining development of Arequipa was originally created by Executive Order No. 002-97, PRES, under the technical cooperation agreement between the governments of Peru and Germany; it has technical, administrative and financial autonomy, with budgetary allocations provided by the Regional Government of Arequipa as well as funding and assistance from various sources of national and international cooperation, aimed at the implementation of projects related to food security, rural development, risk management, climate change adaptation, rural social infrastructure programs and strengthening the operational capacity of the Regional Public Administration.

The project does not affect nor is contrary to the environment, it will neither change nor influence waterways. To the contrary it will support their recovery and preservation,

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• Legislative Decree Nº 1013, Legislative Decree that approves the Law of the Creation, Organization and Functions of the Ministry of the Environment.
• Law Nº 26839, Law for the Conservation and Sustainable Use of Biological Diversity.
• Law Nº 26834, Protected Natural Areas Law.
• Executive Order Nº 038-2001-AG, Regulations for the Protected Natural Areas Law.
• Law Nº 27314, General Law of Solid Wastes.
• Executive Order Nº 029-94-EM, Regulations for Environmental Protection in Electrical Activities.
• Law Nº 28749, General Law of Rural Electrification.
• Executive Order Nº 025-2007- EM, Regulations for the General Law of Rural Electrification.
• Executive Order Nº 031-2007-EM, Regulations for the Organization and Functions of the Ministry of Energy and Mines.
• Decree Law Nº 25844, Law of Electrical Concessions.
• Law Nº 27783. Decentralization Framework Law.
• Ministerial Resolution Nº 535-2004-MEM-DM, Regulations for Citizen Participation for the execution of Energy Activities within the Administrative Procedures for the Assessment of Environmental Studies.

combining modern technology with ancient practices without affecting the customs and traditions of the people in the areas selected.

COPASA has operated since 2007, under the aegis of Regional Ordinance No. 090-Arequipa, once the financial support of the government of the German republic came to an end. Its roles were redefined, becoming the counterparty to the Regional Government of Arequipa for Technical and Financial Cooperation Agreements it may enter into, or have delegated to it.

COPASA's scope of action are the eight provinces of the Arequipa Region, giving priority to the less developed districts and annexations in which the highest levels of extreme poverty are concentrated.

a) The project is aligned with the policies, national development plans and sub-national focus on adaptation to climate change, including the following standards:

b) General Environmental Law (Law No. 28611 of 13 OCT2005) Framework Law of the National Environmental Management System (June 2004) Article 9 defined as functions of the National Environmental Authority follows: "a) propose, coordinate, direct and evaluate the National Environmental Policy b) Approve the Plan and the National Environmental Action Agenda". Similarly, Article 4 paragraph 4.1 states that the environmental functions under the responsibility of the entities that make up the National Environmental Management System are carried out in a coordinated, decentralized manner and subject to the National Environmental Policy Plan and the National Environmental Action Agenda and cross-sector rules made to achieve their objectives.

c) Executive Order No. 012-2009-MINAM (May 2009), approved the National Environmental Policy, incorporating in its paragraph 6, Compliance Standards, the obligation to establish specific targets and performance indicators among other provisions, which should allow monitoring their effective implementation, throughout all three levels of government.

d) With the international treaties signed by the country,the political constitution of Peru, according to paragraph 22 of Article 2 declares the fundamental and inalienable right to enjoy an environment adequate and balanced for the development of life, coupled with the Ministry of Environment which is the lead agency in the environment sector and the competent authority for the formulation of the national environmental policy applicable to the three levels of government in accordance with the provisions of Legislative Decree 1013 of May 13, 2008 which approved the law of creation, organization and functions of the Ministry of Environment.

e) The objectives of the Ministry of Environment are focused on four strategic pillars that define the full and gradual incorporation of the environmental dimension in public policies:

   Axis 1: Sovereign State and Guarantor of Rights

   Axis 2: Improving the quality of life in a healthy environment

   Axis 3: Reconciling the harmonious use of natural resources

Axis 4: Natural Healthy Patrimony: individual and social duty to preserve it.

Framework Law for Decentralization, (Act No. 27783 of 17JUL2002)

Organic Law of Regional Governments. (Act No. 27867 of 16NOV2002)

Organic Law of Municipalities (Law No. 27972 of 26MAY2003)

Organic Law for Sustainable Use of Natural Resources

(Act No. 26821 of 25JUN1997).

As described in section C, the Project has been classified as category B according to the procedure of environmental and social screening conducted by CAF. While the negative environmental and social impacts of the project are expected to be minimal or nil, CAF conducted an environmental and social assessment to verify this assumption and as a result of the evaluation will formulate a Plan of Environmental and Social Management for the project and a Monitoring, Reporting and Assessment of Environmental and Social Management Plan for the Project. During the project implementation in their annual performance reports of the project, CAF will include a description of the status of implementation of the Environmental and Social Management Plan, as well as corrective measures that have been necessary to implement in order to avoid, minimize or mitigate environmental and social risks. CAF's final and mid-term reports will also include an evaluation of the project with respect to environmental and social risks.

The preliminary assessment of the project's proponent states that no additional assessment for compliance is required for the following aspects are central to the environmental and social principles of the Adaptation Fund. While this statement is recognized as reasonable, CAF's Social and Environmental Assessment shall, if applicable, include the relevant actions in the Plan for Environmental and Social Management.

Norms that the Project must fulfill

Below are included norms with which the project must demonstrate compliance or that serves as a reference point for carrying out an activity.

- **Water Quality for Human Consumption Regulations.** Given that the project includes the implementation of 5 water treatment units for human consumption, the project will require from the contractor, prior to final reception of the installations or equipment, that the provider demonstrate through samplings and analysis that the treatment complies with the standards establsihed in Water Quality for Human Consumption Regulations, contained in Executive Order N° 031-2010-SA. Prior to the beginning of operations for the water treatment units, the project will verify that the pertinent registry and authorization requirements are satisfied per the aforementioned regulations.

- **National Strategy for the Preservation of Wetlands in Peru.** In particular, with respect to the Strategy's section 5.3.6. Design, development and recovery of technologies for the management of wetlands, and section 5.4., Management and Sustainable Development Activities, promotion of traditional use techniques for the management of wetlands, the project will report to the Ministry of the Environment on the progress and

results, in order to ensure the dissemination of the experience, and the sharing of lessons learned.

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

The project does not overlap with or support activities that are already supported with other funding sources. Consequently, there is not duplication of project with other funding sources.

Other initiatives in the Arequipa Region that complement the Project were identified:

- **MULTISECTOR PLAN IN THE FACE OF COLD SPELLS AND FROSTS 2014** (http://www.pcm.gob.pe/wp-content/uploads/2014/05/PLAN-MULTISECTORIAL-ANTE-HELADAS-y-FRIAJE-2014.pdf).

  In section 6.3., actions by the Ministry of Agriculture and Irrigation – MINAGRI, the following is expected**:** For the execution of activities foreseen by MINAGRI in order to cumply with the Multisector Plan ara la ejecución de las actividades previstas por el MINAGRI para dar cumplimiento al Plan Multisectorial in the face of Cold Spells and Frosts 2014, a general amount of USD 2.42 MM (8,352,684 PEN) has been budgeted, for the acquisition of:

  - Veterinary Kits (9,136 units),
  - Hay Kits (74,670 units).

  Said budgets can be found within the framework of the Multisector Budgetary Plan 068 Reduction of Vulnerability and Emergency Care for Disasters, The area of intervention with the product encompasses districts in Apurímac, **Arequipa,** Ayacucho, Cusco, Huancavelica, Junín, Pasco, Puno and Tacna, places where it will be held.

  These emergency assistance actions can potentially benefit the members of the participating communities in the project. In the face of the fact that the activities and budgets are already pre-defined and due to the nature of the activities, the veterinary kits can be a complement to project actions.

On the other hand, currently, there are not other initiatives in the target regions that complements the project, but it is expected that the project experience will be used by the local goverments to replicate it with other communities.

As a Regional Governmental Organization, COPASA has updated information related to Adaptation project under development in the region and is able to confirm that, currently, no other projects are being executed with overlapping scope or activities. On the other hand, after 18 years of experience COPASA has executed 11 projects since 1985. This experience has allowed COPASA to design the strategy of the project's capacity building activities considering its knowledge of the local culture, traditions and project needs.

Among the projects/programs executed by COPASA can be found “Adaptation to Climate Change Programme (2006 – 2007)”. This project’s perspective and design have been nourished by the experience gained in that programme; in particular, in the construction of a comprehensive management model that could resolver the disarray of previous experiences.

At present, the COPASA Special Project has been developing the “Program to strengthen local governments (2015 - 2018)”, leading to participatory planning processes, and local budgeting, taking into account criteria of rationality and efficiency, guiding the implementation of projects as planned and per the approved budget. This project proposal perspective is a consequence of the development of such project, and the participatory planning process criteria and processes of such Program have allowed the COPASA to respond to the needs and expectations of involved communities, after having implemented a consultation process. The local budgeting criteria of the programme have been also considered, as well as the programme criteria of rationality and efficiency.

The *Tambos*

There is a project being implemented by the central government, named *Tambo*, which is a center of support services for rural habitats. It consists of an installation built in a rural settlement in which State agents converge to provide infrastructure, equipment, and training services, in a direct way with said community and those in its area, in order to improve their quality of life.

The implementation of the *Tambos* responds to the need to bolster State presence and to make social inclusion possible among rural populations such as those targeted by the project, a population that presents the highest indices of poverty, chronic malnourishment among children, and social exclusion, a situation which has remained constant over many decades and that also, in some indicators, has worsened. Through the *Tambos* the central government seeks to carry out rapid interventions, by means of provision of services and infrastructure in rural areas, thus contributing to their social inclusion, and bolstering the presence of the State.

For the Arequipa Region, five (5) *Tambos* will be built: doubtless, with these interventions the project has options for articulating and complementing, in order to generate synergies that can contribute to fostering sustainability. It is necessary to await their implementation in order to explore possibilities, and very possibly, initiate agreements.

NOTE ABOUT CURRENT ANS RELEVANT GEF PROJECTS:

- Currently, there is a Regional GEF Project (Project name: Conservation of the Biodiversity of the Paramo in the Northern and Central Andes /Proyecto Paramo Andino), with a US$ USD 18,695,304 budget, and whose Geographical Scope includes: Colombia, Ecuador, Peru and Venezuela. The project objectives include:
    i. implement examples of good practice in Paramo management at nine critical Paramo sites,
    ii. support different governmental and non governmental levels to adopt key policies for Paramo conservation,
    iii. increase the technical capacity of Paramo inhabitants and field practitioners to manage Paramo,

iv. increase awareness and information about Paramo among decision makers and the population in general, and
v. replicate best lessons of the project to other ar and scales at Andean level.

Specially in the objective iii (increase the technical capacity of Paramo inhabitants and field practitioners to manage Paramo), the focus of this project is very close to the Aininacuy project activities related to wetlands (Bofedales) recovery. Nevertheless, for Peru, the project activities are focused on the Regions of Piura and Cajamarca, located far from Arequipa.

As this GEF project scope also includes “replicate best lessons of the project to other arand scales at Andean level”, the Aininacuy project will consult them, before, the start of activities in order to verify if there will be information relavant to Aininacuy Project activities to be assimilated.

- On the other hand there is another approved National GEF Project (Project name: Conservation and Sustainable Use of High-Andean Ecosystems through Compensation of Environmental Services for Rural Poverty Alleviation and Social Inclusion). With a US$ USD 18,695,304 budget, this GEF project is oriented to protect and sustainably use of High Andes ecosystems that provide environmental services, especially biodiversity and water, by transfering economic resources from downstream beneficiaries to upstream rural communities.

  The outcomes of this project includes “Conservation and/or sustainable use of at least 25,000 ha of high Andes ecosystems ans landscapes.” And within this coutcome one of the outputs says: “Conservation, rehabilitation, improvement and sustainable management of at least 4,000 hectares of bofedales”, which is very close to the bofedales recovery purposes of the Aininacuy Project. Also in this case, the Geographic scope of the project if Far from far from the Arequpa Region (to be developed in the Lima, Ancsh and Huancayo Regions). As a consequence, the actions of this GEF project are not to be considered as results to built upon, for Aininacuy Project.

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

COPASA has successfully executed 11 projects since 1985, addressing in a focused manner various situations such as emergencies and post-quake reconstruction, disaster risk management, access to energy services, adaptation to climate change, food security, and improved stoves. This depth of experience has provided COPASA with several lessons learned about how to develop a project like this one with Andean highland communities, so that their beneficiaries can take ownership of the project, participate in activities, sharing the effort in the follow-up to the ‘learning by doing’ methodology.

This methodology allows for the creation of foundations of a real sustainability as per the proposal's objectives, to ensure that the impacts of the extreme cold spells cease to be a recurring situation, as is currently the case, and that the population inhabiting the mountainous region of Arequipa develop its capacity to better face the consequences of climate change and to reduce their impacts, particularly for the most vulnerable members of the population (children and older adults) and their livestock capital.

Thus, the preliminary phases for developing a knowledge management strategy, necessary in order to know the resources and awareness levels regarding the Project's several facets, have already been carried out. All activities under Component 2 make up the main body of the Project's knowledge management strategy and are critical for engaging communities and some authorities both in the Project's activities as well as in and sustaining its results.

The implementation of component one activities will be implemented after component two activities have been developed. Learning activities will be based on various methodologies for adult training, including "field days", which are training days where the participants put into practice what they are learning. Learning is expected to be facilitated by the fact that participants are expected to use the techniques learned in his private life due to its practical importance. Additionally, the technical experts in rural communities (*Yachachis*) will support the development of the project with home visits. To enhance the follow up and sustainability of the learning, local vigilance committees, leaded by the *Yachachis*, will be constituted.

Every workshop and fieldwork day shall produce a written memory, with the lessons learned reported by the participants and by the activity leaders at the end of each activity, and complemented during the corresponding practical activity.

The planned development of teaching materials will also bring to capture and disseminate the knowledge already developed in the communities. The preparation of every written guide will include two consultations steps, the first to capture the existing knowledge of interest to be disseminated; particularly in the reported more experienced persons of the community, and the second one to verify the adequacy of the guide design, by using a preliminary version to be tested with community members.

The final version of the teaching materials shall be also transferred to the local authorities during the follow up and replication agreements.

The Project's assessment and monitoring activities will incorporate criteria and indicators for assessing knowledge management activities and will include items for the identification, description and reporting of lessons learned.

At the Project's conclusion, a final report on lessons learned will be made in digital format and will be presented to the authorities and institutions related to the project. This report will have printed report for dissemination to participating communities and other identified communities that may be interested in the experience and that share conditions of vulnerability prior to project.

Section J includes a description of follow up strategies que are complementary to the learning strategy described here.

Factors which make the project's replication possible:

With the intent of highlighting the project's potential for replication, some aspects are included below which reveal similarities in physical and social contexts. The development of repeatable initiatives exceed the scope of this project.

- The Andean highlands, the South American highlands, the Collao plateau and that of the Titicaca region, are all an extensive plain in South America located at an altitude of 3800 masl and which encompasses part of the northwest of Argentina, western Bolivia, part of northern Chile, and part of southern Peru. It has historic importance for giving rising to diverse civilizations, such as the Tiahuanaco culture, and for seeing the domestication of plants like the potato and of animals like the alpaca, vicuña and llama. Due to its environmental and ecological characteristics, it is a unique natural region on the continent and for its altitude it belongs to the so-called *puna* region. The term 'highland plateau' or '*puna*' is generally accompanied by a qualifying term to identify the country in which it is found, that is, the Argentine *puna*, the Bolivian *puna*, the Chilean *puna*, and the Peruvian *puna*. This ecosystem extends through four countries: northwestern Argentina, western Bolivia, where its greatest extension can be found, part of northern Chile, and part of southern Peru.
- Regarding climate change. The results of the IPCC's Fourth Report reveal the central and southern region are registering an increase in the average annual air temperatures of 0.02 to 0.05 °C per decade during the 1901 to 2005 period, with the southeast of Brazil registering the highest increase of more than 0.1 °C per decade. In the mountains the climate warming is be reported with the altitude.
- Changes in precipitation in the 1901 to 2005 period are not homogeneous in the region, revealing a reduction along the Pacific Coast (20 to 40%). The annual trends, however, during the 1979 to 2005 period show an increase (reduction) in the central coast of Chile (in the sector stretching from Bolivia to northwestern Argentina), reflecting the high variability in precipitation and the influence of El Niño in the region, including mountainous regions. At subregional scales, the expected climate change patterns are still difficult to detail due to the Andes unusual topography.
- The mountain glaciers respond with great sensitivity to climate change, both as regards temperature as well as precipitation. With few exceptions, practically all the Andean glaciers (total surface area of more than 28,000 km2, Casassa *et al*., 2007) and a few glaciers on the higher volcanoes in Mexico are experiencing an accelerated retreat in response to tropospheric warming, threatening the provision of water resources from the ice. (Bradley et al., 2006). As was explained previously, in the high elevations of Peru, Bolivia, Argentina and Chile, the raising of South American camelids is very common and widespread way of life.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the environmental and social policy of the adaptation fund.

Based on the interaction and consultation with the local communities, and the experience gathered during several years by COPASA regarding local culture and social environmental and economic issues, which all have an impact on productive activity (in particular through the execution of programs such as: Adaptation to Climate Change Programme, 2006 – 2007; Energy, Development and Life Programme – ENDEV, 2008; Andean Highlands Social Development Programme, 2009; Program to strengthen local governments, 2015 - 2018) , COPASA had identified and verified with the communities the most critical and pressing aspects needing attention, both from the perspective of climate change but also from that of development. Thus, the following aspects have been identified as the most critical and pressing:

- During dry seasons, the natural pastures lose their ability to support grazing notably, resulting in overgrazing.
- The breeders of South American camelids, who do not have access to adequate wetlands and irrigation, suffer losses in their herds as well as diminished fiber production on the order of 5%, and loss of offspring from miscarriage due to environmental stress on the order of 10-15%.
- Due to the fact that in some small villages there is no water during the dry season, losses occur due to deaths caused by malnutrition on the order of 10-15% of the herds, which de-capitalizes the breeders, instigating greater migration to nearby cities in search of means to cover families' basic needs.
- Weak organization among the breeders undermines their ability to negotiate with local authorities a prioritization of their needs within the framework of the development agenda (participative budget).
- They do not have resources to access new technologies which could allow them to diversify their production.
- Deficiencies in the handling of forage planting to improve the nourishment of their herds: high altitude seeds, harvest and post-harvest (storage and/or dry baling of hay).
- Insufficient knowledge of water management in technical manner, water harvesting through the construction of small rustic dykes and wetland and high altitude wetlands management.

As part of the project formulation and COPASA's work methodology, leaders of affected communities, representatives of public organizations, communal authorities, women's organizations, irrigation organizations, breeders' organizations and a representative from the medical post (if one were present) were convened in each of the 17 districts selected for consultation and coordination meetings.

The integrated management approach was proposed by COPASA as a continuity strategy solution to the problems described. Moreover, the set of activities that make up the project was presented to the participants, who agreed to accept it by consensus, including active participation in the activities. Although the effect of consensus at all meetings could be interpreted as a sign of passive participation, it is important to note that the issues and the

actions proposed as an intervention to this set of problems had already been reviewed and discussed over the course of COPASA's interaction with different actors in the region.

The integrated management proposal was received as the implementation of a set of necessary actions, although the participant's interest in discussing the methodology was not evident.

In light of the level of the project's development remains at the proposal stage, a coordination process has not been put forward with the different stakeholders for the elaboration of activities' programming or prioritization of places scheduled for intervention. This coordination will take place once the project has moved to the next stage of its development.

Meeting minutes are available from each of the meetings held between the months of January and February 2015. Meetings were held in each of the selected provinces of Arequipa, Caylloma, Castilla, Condesuyos and La Union. In the meetings participated representatives from the following local district governments: San Juan de Tarucani, Chiguata, Pocsi, Quequeña, Polobaya, San Antonio de Chuca, Sibayo, Tuti, Callalli, Chachas, Andagua, Orcopampa, Chuquibamba Andaray, Yanaquihua, Pampamarca, Huaynacotas Puika. Below are included samples of the supporting documentation from the consultation process.

The project outputs, based on the dominant needs, requests and interests of the participants, summarize the agreements of the meetings. The project target population are the members of the participant communities in the lowest levels of poverty (which will be verified and documented with the SIFHO information system), whose livelihood is the alpacas raising and the sale of the alpaca fiber.

Samples of Minutes and Photographs of the Meetings held in the various Provinces

Two samples of the hand-written meeting memoranda prepared by community members are included. They correspond to meeting held in the Andahua District, Castilla Province, and Huaynacotas District, La Union Province. Two samples of the rolls of those in attendance and two photographs of the meetings are included as well.

Comunidad Campesina Andagua
VºBº SECRETARIA
Provincia de Castilla

ACTA DE REUNION DEL 10 DE ABRIL-2015

10/04/15

EN EL DISTRITO DE ANDAGUA, PROVINCIA DE CASTILLA LOS ABAJO FIRMANTES NOS REUNIMOS EN EL SALON COMUNAL DE LA COMUNIDAD CAMPESINA DE ANDAGUA, PARA RECIBIR A LOS REPRESENTANTES DEL GOBIERNO REGIONAL, DEL PROYECTO COPASA PARA ESCUCHAR A SU DIRECTORA, LA ORA. MARIA ANGELICA SALINAS VALENCIA SOBRE LA POSIBILIDAD DE APOYO POR PARTE DEL GOBIERNO REGIONAL Y LA COOPERACION INTERNACIONAL PARA PODER ESTAR MEJOR PREPARADOS Y ADAPTARLES MAS EFECTIVAMENTE AL CAMBIO CLIMATICO

IGUALMENTE NOS COMUNICO, QUE LOS QUE RESULTAREMOS BENEFICIADOS DEL MISMO, SOLO PONDRIAMOS COMO CONTRAPARTE, LA MANO DE OBRA NO CALIFICADA NECESARIA PARA PODER EJECUTAR LOS DEFERENTES PROYECTOS QUE PODRIAN EJECUTARSE.

IGUALMENTE INFORMO, QUE LAS AUTORIDADES LOCALES, SERIAN RESPONZABLES DE MONITOREAR EL AVANCE DE LAS OBRAS QUE LAS COMUNIDADES SELECCIONADAS EJECUTARIAN, DE SER SELECCIONADAS, INCLUYENDOLAS EN EL PRESUPUESTO PARTICIPATIVO

TAMBIEN NOS COMUNICO, QUE EL PROYECTO CAPACITARIA A LAS AUTORIDADES LOCALES Y COMUNALES EN LO QUE ES LA EVALUACION DE DAÑOS Y CONFORMACION DE LOS COMITES DE DEFENSA CIVIL, EN EL CASO DE LAS COMUNIDADES, SE CONSTRUIRIA O MEJORARIA ESTANQUES PEQUEÑOS, SIEMBRA DE FORRAJES, MEJORAMIENTO DE VIVIENDAS, CONSTRUCCION DE COBERTIZOS, CAMPAÑAS DE SANIDAD ANIMAL Y MEJORAMIENTO DEL HATO DE CRIANZA.

EL SR. MANUEL CANDORI, EN REPRESENTACION DE LA COMUNIDAD SEÑALO QUE ESTABAN PLENAMENTE DE ACUERDO CON EL MISMO Y QUE SOLO ESPERABAN LOS NOTIFICARAN PARA FIRMAR LOS ACUERDOS

ESTUVIERON PRESENTES, REPRESENTANTE DE LA MUNICIPALIDAD DISTRITAL DE CASTILLA MEDIA Y ALTA SEÑALO QUE EL MUNICIPIO ESTABA PLENAMENTE DE ACUERDO Y QUE EN REUNION DE REGIDORES LO COMUNICARIA PARA QUE FUESE APROBADO APENAS LLEGASE.

SIENDO LAS SEIS DE LA TARDE SE DIO POR TERMINADA LA REUNION FIRMANDO LOS PARTICIPANTES EN SEÑAL DE ACEPTACION

JUSTUS

Comunidad Campesina Huaynacotas
VºBº SECRETARIA
Provincia de La Unión

000 2

Acta de reunion y trabajo 27 de Mayo 2015

Los abajo firmantes Reunidos en el local del salon consistorial de la municipalidad distrital de Huaynacotas, provincia de La Union, Arequipa. Para recibir a los integrantes del Equipo Tecnico del Gobierno Regional, para que a través del P.E. Copesa, nos explicaran la posibilidad de un apoyo de la Cooperación Internacional

Informaron que Arequipa era una de las ciudades que mas iba a sufrir por el efecto del Cambio Climatico y que en nuestra provincia era donde se iban a dar los peores efectos, por lo que debiamos estar preparemos para poder adaptarnos de mejor manera a estos efectos

Por ello dijeron que era de suma importancia la mesa Gestión del Gobierno Regional el que podamos capacitarnos en estos temas en forma Conjunta con nuestras autoridades, representantes comunales y Población en general.

Explicaron que habian presentado una propuesta a la Cooperación Internacional, para que luego de ser aprobada, se realizaran trabajos nos permitieran estar mejor preparados, como es el caso de la construcción de Cobertizos y Campañas de Sensibilización para que nuestros animales esten mejor preparados

Con respecto a la alimentación nos explicaron que nos apoyarian en la Siembra de cereales forrageros, asi como en temas de almacenamiento del mismo, Con referencia a los pastos y mejoramiento de praderas, asi como los proyectos de cosecha y siembra de agua, seria coordinado previamente con las autoridades locales y/o comunales, para luego que ellos los que elijan y los que podrian ser beneficiados, Para las familias se apoyaria con el mejoramiento de las viviendas, asi como mejorar el abastecimiento de agua Potable, para ello los Comuneros y las autoridades deberian poder comprometerse, en apoyar con la mano de Obra y seguimiento de los mismos para garantizar se terminen y despues se continue con los mismos y que ademas para garantizar esto se desarrollaria ferias campañas de Capacitacion, Tambien solicitaron que para poder continuar con estas propuestas, los autoridades deberian Incluirlas en los Presupuestos Participativos

Terminada la presentación todos los participantes manifestaron estar de acuerdo con ello comprometiendose a desarrollarlo cuando se haga realidad, mientras tanto de luego el Momento, todo se ejecutaria en armonia y hermandad.

Siendo las 11 de la mañana, se dio por concluida la reunion agradeciendo a los invitados por su participacion, se dio por terminada la reunion, siendo firmado el libro de actas por los participantes en Aprobación

Comunidad Campesina Huaynacotas

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GOBIERNO REGIONAL
PROYECTO ESPECIAL COPASA

AÑO DEL BICENTENARIO DE LA GESTA PATRIÓTICA DE MARIANO MELGAR VALDIVIESO

PLANILLA DE ASISTENCIA

TALLER: Presentación Proyecto Aymarakuy LOCALIDAD: Cayllomo

FECHA: Marzo 2015

Fredy Apaza Paz	I.E. 40127 "S.E.S."	
Oscar Apaza Llaza	PNP	
Filomena Ulica de Olivaya	GOBERNADORA	
Centro de Salud Chiguata Adela Flores Cayo.	Asistente Social	
Mateo Macedo	presidente AS. vivienda	
Regende Legoc	Presente Junta	
MARIO Quispe S.	Casi Cari	
Jose Ushiñahua	Rep Obras Publicas Municipi Chiguata	
Oscar Cayro Suaña	Regidor Municipalidad Chiguata	
Bernal Coaquira Yoselin	Asistente ODUR	
GREGORIO Corrales D.	Alcalde	
Juan Talavera R	C. Regante	
Arturo Rivera V.	GRA - Copasa	

GOBIERNO REGIONAL
PROYECTO ESPECIAL COPASA

AÑO DEL BICENTENARIO DE LA GESTA PATRIÓTICA DE MARIANO MELGAR VALDIVIESO

PLANILLA DE ASISTENCIA

TALLER Presentación Proyecto Ayninakuy .... LOCALIDAD Castilla

FECHA Abril 2015

Gladys Molina Huamán	Directora	22-05-2015
Mayra Delgado Rivera	Gobernadora Yarabamba	MINISTERIO DEL INTERIOR Mayra M. Delgado Rivera GOBERNADORA DISTRITO DE YARABAMBA
Rudo Poro Steven Neyra C.	Sacerdote encargado	
Marida Perez Vargas	Responsable P.S. Yarabamba	CEP 23317
Leonor Acuña Yucra	Prof. I.E N°40209 "Heroes de Yarabamba	29423135
Anny Fiorela Leayza Paredes	Pobladora	40360446
Kelly Coaguila Tarifa	Pobladora	[illegible]
Milagros Coaguila Centeno	Pobladora	44356386
Karol Quequezana López	Pobladora	71949263
Moisés Condori Olazábal	Poblador	40231191
Humberto Romani V.	trabajador	29584164
Alexander Soza	trabajador	29549062
Esther Cruz Malaga	Poblador	71316589
FREDDY VERA ZEGARRA	TRABAJADOR	29514573
ERICK OJEDA ARENILA	TRABAJADOR	30862375
Zoila Chávez Basilio	Trabajador	20911486

A. Rivera U. GRM COPASA

No vino?

Photograph: Meeting held in the District of Huaynacotas in the Province of La Union. **Source:** COPASA Archives (2015)

Photograph: Meeting held the offices of the Regional Department of Agriculture in Arequipa, to present the.proposal **Source:** COPASA Archives (2015)

Principal Stakeholders of the Project:

- The Regional Government of Arequipa.
- Regional Office of Agriculture of Arequipa
- Regional Office of Education of Arequipa
- Administrative Water Authority of Arequipa
- Local Water Authority of Arequipa

- Regional Office of the Environment of Arequipa.
- National Meteorological and Hydrological Service of Peru, Arequipa
- National Institute of Natural Resources, Arequipa Region
- National Animal Health Service, Arequipa Region
- The local governments of the eighteen districts, project's area of influence, belonging to the provinces of Arequipa, Caylloma, Condesuyos, Castilla and La Union.
- Representatives of Community Organizations
- Representatives of the Andean Camelid Breeders' Associations in the Highland areas of the Arequipa Region.
- Representatives of the various Health Centers, Posts and Stations in the eighteen districts, within the Project's area of influence.
- Representatives of the Civic Organizations in the selected provinces and districts.
- Rural associations or communities within the Project's area of influence.

About consultation with women of the community:

With the intent of recording the perception of the women of the project, various unstructured interviews were held, in Quechua, with women in the project's target communities, in different contexts from the meetings described above. The interviews were aimed at obtaining their opinions and points of view about the benefits of developing the project in their communities, in a context unaffected by pressure. In general, an enthusiastic approval was obtained, validating in this manner, from the femenine viewpoint, the necessity of implementing the proposed adaptation actions.

In addition to these interviews, in particular because women are the community members who spend the most time caring for livestock and crops, a series of surveys were done, oriented at establishing baselinbe information for the project.

Below is included el questionnaire employed between January and February of 2015, under the responsibility of COPASA's professional staff Arturo Rivera (engineer) and Rosmary Quiñones (social worker), who were also responsible for the aforementioned interviews.

NOTE: Although Quechua is a primary language in the rural areas of the Arequipa Region, the project is not working with specifically indigenous communities, but rather rural Andean communities, made up of families that live in and exert control over determined territories, linked by ancestral, social, economic and cultural ties, expressed through the communal ownership of land, communal work and mutual aid.

QUESTIONNAIRE USED IN INTERVIEWS WITH WOMEN IN PROVINCES OF THE AREQUIPA REGION DURING THE MONTHS OF JANUARY AND FEBRUARY OF 2015

SOCIOECONOMIC ACTIVITY

- Socio-familiar situation
- Types of family
- Total of benefitting families
- Family leadership
- Population graph according to gender and age group of heads of households
- Parents' educational level
- Population by gender and age group of children
- School Attendance
- Educational level of children

FAMILY ECONOMIC SITUATION

- Principal and secondary family income
- Family Economic Income

ANIMAL HEALTH IMPROVEMENT

- Livestock Aspect
- Livestock Population existing in the area:
- Epidemiological Data: Animal Health according species
- Animal mortality due to COLD
- Animal Miscarriages due to COLD
- Need for remedies
- Composition of livestock herd

GENERAL CENSUS OF COMMUNITY POPULATION AND ANIMALS

- Breeding style
- Characterization of breeding style
- Herd's Health Situation:
- Situation of natural pastures
- Families' Agricultural Knowledge of Forage Crops
- Families' Knowledge of Techniques for Expanding Highland Wetlands

IMPROVEMENT OF ANIMAL NUTRITION

RISK MANAGEMENT

- Knows how to identify dangers existing in his/her community
- Categorize the dangers that affect his/her community in order of importance
- Knows how to identify vulnerabilities that affect his/her community
- Knows how to minimize the vulnerabilities of his/her community
- How he/she would reduce his/her community's risks

Below are included two photographs of the surveys.

I. Provide Justification For Funding Requested, Focusing On The Full Cost Of Adaptation Reasoning.

Below is a comparison bewteen the baseline (no project intervention) and the proposal of the project's adaptation activities with the goal of justifying the Full Cost of Adaptation.

Baseline line, No project intervention.

1. Because of the cyclically repeated impacts of cold spells, raising camels at high altitude periodically suffers large losses, which, according to estimates from the Ministry of Agriculture (MINAG, for its acronym in Spanish), can reach 30% of the animal population during a cycle.

2. To date, the aforementioned MINAG (Ministry of Agriculture) has been responding to these impacts in a reactive manner, and under a distant and centralized administrative framework, with low effectiveness in prevention and meager projection in the management of long-term risk.

3. In this way, the Ministry has undertaken: distribution of seeds (2007), construction of shelters (2006 to 2010), distribution of medicine and hay (2008 to 2010); implementation of the National Intervention Plan for confronting the effects of frosts and cold spells (2012, decrees DS 092-2012-PCM y DU 015-2012-PCM); distribution of: teaching kits, coats and blankets, veterinary medicine kits, hay bales (2013, Multi-sector Plan for Response to Frosts and Cold Spells 2013, DS N° 064–2013-PCM); distribution of beds, mattresses and blankets, hay and veterinary kits, medical attention and others (2013, Multi-sector Plan in response to Frosts and Cold Spells, DS Nº 102-2013-PCM) 2014 Secretariat of Disaster Risk Management of the President's Council of Ministers (PCM, for its acronym in Spanish); construction of highland corrals, distribution of kits, coats, housing upgrades, teaching and veterinary kits, distribution of hay, others (2015, Secretariat of Disaster Risk Management, Resolution N° 001-2014- PCM/SGRD). All of these interventions have surpassed by far S/.

200,000,000.00 (PEN) (approximately USD 74,000,000. at the prevailing exchange rate in the years in which these expenditures occurred).

4. In the scenario described, the Andean alpaca raising communities affected by cold spells and other manifestations of climate change have low capacity to respond to the impacts of variability as a result of their financial and management limitations and the lag in the effectiveness of their ancestral practices in the face of the rigors of climate variability (low temperature, intensity of winds, rainfall patterns, decreased water supply from glaciers). As a result, the sustainability of their livelihood at present is threatened in the medium term, due to high cyclical losses.

5. The interventions undertaken by the central government have had significant financial costs, due to the weight of a remote, complex administrative structure, with a low capacity for sustaining prolonged contact with the target communities, and with scarce or non-existent followup and assessment of intervention results.

6. The interventions undertaken to implement physical protection from the cold, for alpacas, have been done as external intervention, without the accompaniment of technical training that might prepare for ownership and the maintenance of the physical protection elements provided.

7. The interventions undertaken in order to resolve abrupt limitations in forage has had two actions: delivery of hay to rural populations, and of resistant seeds. These actions have had significant financial costs. Hay deliveries, despite having become reaction framework and even a symbol of government aid, turn out to be ineffective insofar as they do not respond to the necessities and nutritional option of alpacas, and the rural populations tend to convert these contributions into commodities for the regional market. With respect to the delivery of seeds, they have been handed over without any sustained technical assistance that could make the transformation of productive forage practices possible. Additionally, generating the custom of this kind of support tends to generate habits of passivity in the affected communities, as a result of which, in the long run, the aid comes social and prejudicial to production.

8. In the face of a reduction in the productive capacity of natural resources used for grazing (highland wetlands or *bofedales*), there are no antecedents of neither state nor private interventions, for avoiding their continued reduction due to the limitation of water resource, nor for avoiding their exhaustion due to overgrazing.

9. Scarcity of water resources (a resource necessary both for basic necessities as well as to sustain the foraging productivity of terrain used grazing) is also an element of cyclical stress that has been increasing in these areas. Given that it is not a trigger element of cyclical climate crises, it has not received attention in emergency responses. Although it is an element that has begun to receive attention in regional strategic plans[45], it has not yet

[45] Regional Climate Change Strategy in the Arequipa Region 2009: In the measures and policies for confronting Climate Change, some guidelines are defined in section 6.3.3 Diversity and Water Sources Protection.

moved past the level of strategic considerations, without reaching the level of the definition of practical projects on a broad scale. Without the project's intervention, the risks to the sustainability of productive activities like alpaca raising are increased in the medium term, due to projections regarding water scarcity in the future.

10. Limitations in the availability of water resources lead to use for human consumption from non-potable sources. This situation has been generating high indices of diarrheic illnesses that affect principally the population younger than 5 years old in the project's target areas. Even though health campaigns have been undertaken that include an awareness raising element of the impacts on health due the use of untreated water, there are no antecedents of systematic actions directed at eliminating the cause of untreated water. From the perspective of no project intervention, this situation will tend to persist. Although it is an aspect of quality of life, its impact on productive activity is found in a basic motivation to sustain family life in this area, in the face of the expectations of migration.

11. From the perspective of building sustainability of alpaca raising for fiber production, the basic housing conditions in the face of climate changes are an unavoidable factor for the social validation of the project's actions: taking care of shelters for alpacas without taking into account family living conditions bring to the fore risks of social rejection of the proposals. New conditions arising from temperature variations are an unforeseen factor in the traditional family dwelling, and the high indices of respiratory illnesses that affect the population younger than 5 years old demonstrate this. In emergency responses, the government has dealt with this problem in the dimension of its consequences, so, for example, the Executive Order Nº 102-2013-PCM, from the Secretariat of Disaster Risk Management of the Ministry of the Presidency of the Council of Ministers (PCM), established a series of actions to defend the lives and well-being of the affected population: distribution of beds, mattresses, shelter kits for children younger than three, medicine for prioritized attention of acute respiratory illnesses. Although responses are plausible, they are not accompanied by others aimed at reducing exposure to cold risks in the family residence. On the other hand, although awareness and information about the solutions for confronting this problem have started to spread through professional circles related to the problem, in the institutional strategic projections, a broad spectrum response has not yet been incorporated.[46] Without project intervention, for target areas, exposure in the face of heightened risks due to new extreme variations in temperature, in the family life, tends to persist unchanged.

12. The establishment of early warning systems also have been incorporated into regional strategic guidelines[47], but local solutions are not yet being built on a large scale. Without project intervention, for the target areas, the implementation of basic early warning systems could take many years.

[46] Regional Climate Change Strategy in the Arequipa Region 2009.

[47] Regional Climate Change Strategy in the Arequipa Region 2009: Section 6.3.2. Institutionality for the Monitoring Systems for risks in the region. It proposes the guideline of building institutionality for integrating risk monitoring. 6.3.2. Institutionality for Monitoring System for risks in the region (glacier retreat, natural dangers, etc.)

13. In terms of skills development, the regional strategic forecasts are moderate. The Regional Climate Change Strategy in the Arequipa Region 2009 foresees in the measures and policies for confronting Climate Change some guidelines that only emphasize awareness raising. [48] In order to build sustainability for the productive activity of alpaca raising for fiber it is essential to achieve an important cultural transformation that involves: the modification of some key productive practices of the participating communities (water management, cold resistant forage production, preservation and maintenance of grazing areas, rotational pasturing, physical of herds, recovery of highland wetlands, adaptation and improvement of family residences), the assimilation of basic risk management practices on the part of community members and some local authorities, the sensibilization of communities in the face of their participation in the development adaptive capacity. Without project intervention, the risk of repeating the same emergency response actions without the active and responsible participation of the affected communities in the construction of effective adaptation scenarios, as a result of which the productive activity of alpaca raising is maintained under a known risk.

Adaptation Measures within the project's framework.

Note: In order to facilitate the comparison, this section follows an enumeration parallel to the one utilized in the prior section. As such the paragraphs of the two sections marked with the same numeral can be compared.

1. The Project is oriented to responding to set of challenges that the sustainability of economic activity of alpaca raising for fiber production, in the Andean highlands of Arequipa (an activity which in the majority is exclusive):

2. The project is aimed at implementing an integrated management model that avoids the replication of disperse efforts and offers a consistent set of options for strengthening the main and almost sole livelihood of vulnerable target communities (raising alpacas for selling their fiber). The project seeks to manage the set of variables whose dynamic jointly affects the sustainability of alpaca raising productive activity for their fiber in Andean highland communities in the Arequipa Region.

3. The Project proposes an integral solution in which the articulation, centralization and coordination of adaptation measures can offer a reduction of costs which recur cyclically, as well as greater effectiveness.

4. While centralized state interventions have evolved into some preventive measures, the centralized action scheme has not arrived at a preventive solution for medium and long term that will avoid or significantly reduce the recurrence of progressive losses caused by climate change. The Project proposes an preventive solution for medium and long term.

5. A project component is oriented to developing, in the participating communities, the technical capacities that will allow them to develop their adaptation capacity, integrating

[48] Regional Climate Change Strategy in the Arequipa Region 2009: Section 6.3.10 Citizen Participation: Recruitment, awareness and dissemination.

them to traditional knowledge through a proposal of communication and transference of practical knowledge of proven efficacy in the region (support from the Yachachiqs).

6. In addition to cost reductions (with respect to prior and habitual state intervention), the project includes a follow-up, assessment and reinforcement of training activities, in order to guarantee their effectiveness.

7. The activities oriented to the construction of shelters against the cold for alpacas will be accompanied by technical training in parallel, in order to establish among the members in the participating communities a capacity for response and the maintenance of said shelters.

   Although the rural community members who have maintained this activity for generations had traditional technical solutions for building shelters against the cold, climatic changes have pushed their effects beyond the scope of known protection strategies. The wind patterns in particular require a transformation in the design of shelters, to ensure their resistance to the new wind patterns, while the communities' ability to respond to this variable has not allowed for a transformation of traditional knowledge. On occasion they have been aided with the distribution of technically upgraded shelters. This know-how, however, has not yet been assimilated by the communities. The distribution of a physical good is not sufficient because it does not guarantee the sustainability of its benefit. The project aims to build technically updated shelters with the proficient and instructive support of community members, previously trained, with the dual purpose of building these essential physical assets in a cooperative and participative action by the community and of encouraging both the assimilation of new technical approach into the community's culture. It is hoped that with the assimilation of new technical perspective, the community members remain able to reproduce the construction of these shelters and perform their maintenance on their own.

   Another important aspect of protecting the health and lives of camelids in the face of the effects of climate change is the care of their health to ensure that the herds are in optimal conditions in order for them to best withstand the cold spells. This is why the project includes also camelid health campaigns.

8. Faced with the cyclical reduction in forage sources for alpacas, caused by cold spells, and the loss of pastures during periods of drought, in order to reduce in medium and long term the costs of these interventions and to generate the sustainable practice of self-sufficiency regarding the necessary forage, the project proposes:

   - Introduce the cultivation of pasture and forage plant species that are resistant to cold, such as ryegrass and dactylis glomerata (pastures) and forage grain, UNA 80 variety, basic Hatif Grignon Barley (forage). Although this includes the delivery of resistant seeds, which the State has been done on various occasions, the project seeks to break the long-term ineffectiveness of this kind of action by coupling the distribution of seeds with a technical training process under the 'learn by doing' approach.Additionally, in order to overcome the limitations of cultural gaps in intervention actions, and in seed distribution, the project will use a practice with

proven effectiveness that consists of relying on community members recognized for their knowledge and experience (the "*Yachachiqs*") in order to implant into the community's customs the use of the high altitude species or varieties of improved seeds (this resource will also be used for other skills training actions).

- Introduce pasture rotation and fencing, with the aim of avoiding overgrazing and pasture scarcity.

9. In the face of a reduction of the productive capacity of the natural resources used for grazing (highland wetlands), the project proposes to engage the communities that use these natural pastures, such as high altitude wetlands (bofedales), in the care and expansion of these areas through the introduction of native species (red and white clover) and the maintenance of the distribution canals that provide them with water.

10. In the face of a scarcity in water resources, the Project introduces a rationalized use of water, extending the construction of earthwork dykes for storage and implementing irrigation systems to sustain pastures during droughts.

11. With respect to limitations in the availability of water resources that leads to use of non-potable sources for human consumption, the project proposes the implementation of five (5) community water treatment systems.

12. In reference to the limitations of family dwellings in resisting cold spells, the project proposes the implementation of improvements in two rural residences in each of the participating communities (for a total of 72 improved dwellings), with cold resistant specifications and composting latrines. These improved residences have the purpose of serving as a model for low-cost upgrades within reach of the communities. In order to bring the upgrades to communities' technical capacity, the project's training component will include the implementation and management of the upgrades.

13. The implementation of EWS (Early Warning Systems) is indispensable for reducing exposure to the risks of extreme cold and for setting in motion response actions. In of itself, the financing dedicated to this activity fulfills an adaptation to climate change function and also complements and ensures the investment directed at all the other actions designed to strengthen the camelid breeders' way of life and fiber production.

14. The majority of the project's skills development activities are focused on increasing the resilience of the project's target communities: the transmission of technical knowledge (for the construction of shelters, for the cultivation of alternate species and for the preservation of pasturing areas, for pasture rotation, and for sustainable water management), which include the development of support materials for these activities, indispensable support for ensuring success in the results arising from the implementation of Component 1 activities.

    The rest of the skills development activities are aimed at local authorities or the immediate surrounding, with the goal of developing and strengthening awareness in the face of risks arising from climate change and preparedness for managing those risks.

The project proposes Followup on the effectiveness of skills formation and the need for their reinforcement will be agreed on with local authorities, through the same means of communication (*Yachachiqs*). As regards training actions for the communities:

The project seeks to create within target communities resource appropriation skills in order to manage the impacts of cold spells. Thus, the project, instead of delivering shelters built by foreign technicians to manage the emergency, aims at empowering communities in the construction and maintenance of technically improved alpaca shelters. In this same vein, the project will provide training in the streamlined management and optimized use of grazing areas. The autonomy the project seeks to instill in the affected communities arises from an interest in ensuring that the management of cold spell impacts are appropriate for the community, which will contribute to the long term sustainability of the results. With this, the project offers the prospect of avoiding or reducing in future significant costs arising from reactive actions common to the centralized government's response model.

15. The project seeks to establish a precedent of comprehensive management run and coordinated at the local level, with the goal of contributing to the transformation of the ensconced social dynamic of ineffective and reactive attention in which the same communities, the state with its centralized management schemes, and other social agents have participated with a notable level of passivity. Each one of the two project components ends up being essential for achieving the stated objectives.

16. Adaptation Fund resources will be used to ensure that vulnerable communities targeted by the project are provided with adequate knowledge and resources in order to strengthen and develop their livelihoods and reduce their vulnerability to climate change risks. The project is expected to be replicated subsequently in more regions of the Andean highlands in Peru.

    This project has an emphasis on gender, as it is largely the responsibility of women to do the alpaca herding and tend to the highland crops, considering male migration in search of employment options.

    The project has been designed to integrate with government programs and the knowledge and experience gained will be shared with authorities at the municipal**, regional** and national levels to encourage their replication.

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

An initial element intended to ensure the sustainability of project outcomes is the active involvement of stakeholders in the project's target communities engaged in productive activities. This aspect aims at encouraging autonomy and initiative in the management of climate change risks that affect their productive activities, and that are within their reach, with the goal of disrupting the passivity inherent in being cared for, a very significant cultural aspect in the framework of response capacity in the face of these risks.

A second element considered in order to ensure the sustainability of the project's outcomes is the incorporation of transmitted knowledge in the training activities. The strategy of relying on

knowledge leaders, who will have received prior technical training in order to channel information and learning through communication channels important to the communities will also be proposed both for the purposes of follow-up as well the implementation of practices, such as the permanence of construction skills.

The design and implementation of the training activities are based on the experience of COPASA with the communities of the project area. This is why the *Yachachiqs* and the Quechua are going to be considered, and a participative paradigm of teaching. On the other hand, the empowerment of the women the project will seek is expected to promote participation, leadership and decision of the women in the production activities to be developed and improved. It is expected to favour an active and respected role of the women, not only to influence the sexist dominant culture, but also to enrich that culture with the dynamism of a recognized role that will seek to affirm his presence in the community by leading what they have been trained to do.

As mentioned, the main strategy to sustain the community management of activities (in addition to the capacity building activities) is to make agreements with the local authorities to include the project outputs and activities in their monitoring activities and also to expand or replicate them. Currently it is not defined if those agreements will include additional financial support to ensure sustainability beyond the project.

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At the institutional level, to ensure the project's sustainability, project plans include the implementation of inter-institutional agreements between local governments, presidents of rural communities, boards of irrigation users, irrigation committees, producer associations Alpaqueros, associations of parents, the regional Directorate of Agriculture, Local education Management Units, health centers, National Meteorological and Hydrological System-SENAMHI and COPASA, a public decentralized entity under the Regional Government of Arequipa, dependent on the Regional Government, which acts as a technical and financial counterpart to the cooperation agreements entrusted to it by the Regional Government of Arequipa. In its role as an autonomous body, COPASA has autonomy and relies on support from the authority of the Region's executive branch. These inter-institutional agreements include specific clauses for:

- Following up the results of the project, using the indicators proposed by project that are applicable.
- Identifying training and updating needs as necessary to give continuity to the techniques, practices and knowledge provided by the project and implement a systematic process for monitoring, evaluation, and corrective training action, relying on the model proposed by the project outline, centered on the *Yachachiqs*.

- Regarding the project results and other needs identified as necessary to ensure the sustainability of the productive activity of raising alpacas, identify periodically (every six months or at most annually, as agreed with communities at the end of the project) those coordination needs with community and local authorities and lead and/or participate in the implementation of their agreements, verifying the active participation of communities. These actions will be supported in a constant monitoring under the responsibility of the Regional Government through its various interventions in the project areas.
- Incorporate the Adaptation to climate change component in the district strategic plans, to ensure that local authorities are those responsible for the economic and political sustainability of project results.

In Peru, the National Budget Act, the destination given to the resources provided by the national government, local governments, is established in public hearings where the attention given to the projects is prioritized according to the analysis and requirement of the population which approves it. This is called participatory Budgeting. Part of the training the project will develop shall aim at encouraging the active participation in hearings and in the participatory budget.

The Arequipa Region has developed the Coordinated Regional Development Plan, 2013-2021 Arequipa, which provides the regulatory framework, regional policies, external and internal context, Regional Vision 2021, regional strategic priorities, and evaluation, tracking and monitoring schematic, which form part of this Regional Ordinance, and their pp. 94, 115, and 118 points to the Development Axis, the Regional Goals and Agenda of Regional Programs and Projects. [49] The current development of this regulatory framework is consistent with the aspirations of maintaining the project's sustainability, since the intended objectives are gathered into the design of the Plan.

It is through these processes that we will ensure the project's financial sustainability, since the beneficiaries thereof will request that the respective bodies provide the budget necessary to continue these activities. Similar experiences are now found in other activities that COPASA is developing in the mid-range zones of selected watersheds, because the activities are part of the priority projects in the participatory budget in each district. The support in this successful history is part of the strategy proposed by COPASA to ensure the project's sustainability.

For the project's development, the building of balanced relationships based on mutual respect are held as a core principle as regards the expectations of rural populations for improving their living conditions and way of life, and achieving sustainable development. In the culture of the local communities there are already present principles of this nature which form an important part of their cultural heritage.[50] The project will seek to unfold in harmony with them and at the

[49] file://servidor/Users/proyectos/Mis%20Documentos/Downloads/pdc2012-2021.pdf

[50] Among these principles, the following ones stand out:

Interrelatedness. For the Andean world all that exists is knot of interrelations (ex. Offering to the Earth).

Correspondence. As a complementary part of the former principle which explains the existing correspondence between different aspects or areas of reality, a species of harmony of the cosmic and human planes, of life and death, good and evil,

Complementarity. It is fundamental and it deals with a specification of the former principles that establish in a clear and firm manner that no being, no action exist in separation.

same time recognize these values and promote them with the goal of developing a living relationship between the project and the cultural and social dynamic of its immediate setting.

NOTE: As mentioned in section A, the project follow up strategy includes: 1. Project impact evaluation (about six months after the end of the project); 2. Indicators follow up (at least one year after the end of the project); 3. A follow-up budget allocation to be negotiated with the local governments; 4. Periodic visits by COPASA, after the end of the project (to be negotiated). Follow up findings shall be solved by reinforcement plans or action in order to cover gaps f the learning process (the actions may consider the local experts support).

To ensure the financial sustainability beyond the project, in addition to the follow up budget allocation to be negotiated with the local governments, strategic alliances with development banks will be explored.

The table included below shows the commitments and coordination actions anticipated for ensuring the sustainability of project results:

Table N° 13

	ACTIVITY	**OUTPUTS**	**ACTORS**
1	Presentation of the detailed proposal of the project's components	• Working meeting with Municipal institution at the provincial and local level • Working meeting with the Community Organization • Memorandum: concerns and commitments for the signing of Inter-institutional Cooperation Agreements	Local Authorities: • Provincial level • District level • Community level
2	Elaboration of cooperation agreements and shared responsibilities	• An Agreement for each public institution in the project area • An agreement for each province • An agreement for each district • Elaboration of an agreement for each community **In the end there will be:**	✓ Institutional representatives ✓ Local, provincial and district authorities ✓ Community authorities ✓ Representatives of producer organizations

Reciprocity. This principle is an ethical expression of the principle of correspondence which governs the relationship between man and nature and with other humans. (ex. The *Ayni* (mutual exchange), the *Minka* (communal work) are forms of reciprocity with peers).

	ACTIVITY	OUTPUTS	ACTORS
		✓ 20 Agreements with public and private institutions ✓ 05 Agreements with provincial municipalities ✓ 17 Agreements with district municipalities ✓ 34 Agreements with irrigation organizations ✓ Agreements with producer organizations ✓ Agreements with representatives of rural communities	
3	Selection of beneficiaries	Definition of direct and indirect project beneficiaries. NOTE: In a community assembly the criteria for selecting direct beneficiaries will be determined Meeting minutes are generated in which the commitments of selected persons are recorded and sanctions indicated for failure to fulfill agreements.	Local authorities, community authorities, representatives of community organizations
4	Improvement and development of skills	Participation of all the members of the prioritized communities in the skills building field days	All the community members that participate in the other project activities
5	Realization of activities	Definition (with the participation of community authorities) of the selection criteria for suitable instructors for the training activities (*Yachachiqs*,	Community authorities

	ACTIVITY	OUTPUTS	ACTORS
		technicians, promoters, etc.) Attainment of key project outputs.	
6	Participation in the development of local planning tools,	Inclusion of pertinent actions and follow-up to project outcomes in the participative budgets and realization of Strategic Plans NOTE: Through participative budgets, it will be assured that the government lend support to these activities and that they remain as objectives to be pursued every year: these objectives will also be included in their strategic development plans	Local and community authorities
7	Coordination between local and communities authorities for the implementation of monitoring and assessment.	Coordinated implementation of monitoring and assessment actions	Local and community authorities NOTE: these actors, as the signatories of the agreements, will also be responsible for guaranteeing the subsequent monitoring and assessment after the culmination of the project
8	Elaboration of report with local authorities	Final report (to be presented to the Adaptation Fund) NOTE: The community representatives reveive a copy of the report for their assessment of corrective actions.	Local and community authorities

Key stakeholders identified for guaranteeing the resources coming from the State (through the Participative Budgets explained above) and for the prioritization of support for future projects for climate change adaptation are local, provincial, district authorities, mayors and municipal council members.

As key stakeholders for proposal ownership and the inclusion of its continuity in the Participative Budgets the following roles have been identified:

- Leaders of rural communities
- Boards, commissions, and irrigation committees
- Camelid breeders associations
- Mothers' clubs
- Political authorities (lieutenant governors)
- Parent Educational Associations (APAFA, for its acronym in Spanish)
- Nutritional committees (known as *Vaso de Leche*, 'glass of milk')
- Medical post
- Educational institutions
- Other Institutions: ARMA (Regional Environmental Bureau), SENAMHI (National Meteorological and Hydrological Service), Farm Bureau, INDECI (Institute of Civil Defense), provincial, district and community civil defense platforms)

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

CHECKLIST OF ENVIRONMENTAL AND SOCIAL PRINCIPLES	NO FURTHER ASSESSMENT REQUIRED FOR COMPLIANCE	POTENTIAL IMPACTS AND RISKS – FURTHER ASSESSMENT AND MANAGEMENT REQUIRED FOR COMPLIANCE
Compliance with the Law		To be reviewed during E&S Evaluation
Access and Equity		To be reviewed during E&S Evaluation
Marginalized and Vulnerable Groups		To be reviewed during E&S Evaluation
Human Rights		To be reviewed during E&S Evaluation
Gender Equity and Women's Empowerment		To be reviewed during E&S Evaluation
Core Labour Rights		To be reviewed during E&S Evaluation
Indigenous Peoples		To be reviewed during E&S

		Evaluation
Involuntary Resettlement	Not applicable	Not applicable
Protection of Natural Habitats		To be reviewed during E&S Evaluation
Conservation of Biological Diversity		To be reviewed during E&S Evaluation
Climate Change		To be reviewed during E&S Evaluation
Pollution Prevention and Resource Efficiency	Not applicable	Not applicable
Public Health	Not applicable	Not applicable
Physical and Cultural Heritage	Not applicable	Not applicable
Lands and Soil Conservation		To be reviewed during E&S Evaluation

NOTE: The Project Environmental and Social Evaluation shall be executed after the presentation of this proposal to the AF Secretariat. Its corresponding Environmental and Social Management Plan and the Monitoring, Reporting and Evaluation Plan will be delivered to the Adaptation Fund Secretariat as soon as the assessment is completed. The impacts of the project activities are expected to be very low, and the project has been categorized as B in order to verify this assumption. Following, a list of minimal environmental impacts is shown, **just to demonstrate** that the impacts have been reviewed and why they are considered minor impacts.

Preliminary Analysis of the Project's Environmental Impact

1. Compliance with the Law

No special issues are considered. To be confirmed verified during the evaluation visit.

2. Access and Equity

No special concern.

3. Marginalized and Vulnerable Groups

During the construction phase, which will last for one month, a positive impact on the sector is expected due to the participation of the villagers themselves in construction projects, which will allow them to receive a salary for their contribution as labor.

Te compliance with this principle shall be carfully considered during the evaluairon visit.

4. Human Rights

No special concern.

5. Gender Equity and Women's Empowerment

Gender issues to ve verified during the visit.

6. Core Labour Rights

No special concern.

7. Indigenous Peoples

Not applicable

8. Involuntary Resettlement

Not applicable

9. Protection of Natural Habitats

During the operation and maintenance phase, the impact on vegetation will not be relevant in the ecological context. During the operation and maintenance phase, the impact on fauna will be minimal, given that it will become accustomed to movement in the area, and be able to return from the areas it will have migrated to during the construction phase. These couple of assumptions shall be carefully verified during the evaluation-verification visit at the bofedales.

10. Conservation of Biological Diversity

Bofedales handling to be carefully considered during evaluation visit.

11. Climate Change

No special concern, beyond adaptaaion activities.

12. Pollution Prevention and Resource Efficiency

During the operation and maintenance phase the impact on the aquatic environment will be minimal. This assumption shall be carefully verified during the evaluation-verification visit at the bofedales and other open spaces.

While environmental and social assessment of the project is done, we have established the following measures to control and mitigate impacts that will be confirmed, transformed or replaced as a result of the evaluation.

Avoiding air pollution:

The ground will be sprayed with water to control dust; the vehicles will be operated at low speeds.

Transported materials should be adequately wetted and covered to prevent their dispersal.

Avoiding potential soil contamination:

Construction areas will be demarcated to avoid impacts on soils outside the perimeter of the building site.

No material will be deposited inside the canal trenches to avoid their contamination.

The organic soils removed during the initial construction phase will be stockpiled in designated areas for later use during the operation and maintenance stage.

The inorganic soils removed during the initial construction phase will be stockpiled in designated areas for their use during this same phase.

Septic tanks, ponds for sewage treatment, and drainpipes will be sealed.

Avoiding the potential contamination of moving water:

The dewatering system chosen must not cause any turbidity in water, puddling or other damage to the environment.

To avoid generating particulate matter (dust), access roads and work areas will be kept wet.

The disposal sites for excess material will be at a sufficient remove from bodies of water, so that, even during flooding, they will remain unaffected.

During the Closing Phase:

The embankments resulting from cutting in quarries must be replanted in order to increase their soil stability. This measure will minimize the landscape alterations that occur in the area.

During the construction's execution period environmental training activities must be held, aimed in a preferential manner at the construction personnel (professional and technical), since this stage constitutes the period in which the environment will be most exposed to changes arising from the construction of the project's proposed works.

To avoid altering the area's landscape, reforestation is recommended using native vegetation, in areas where the camps and workshops have been built camps, or other places where excavation has been done (quarries and trenching for canals).

13. Public Health

Issues related to Cold peaks inciding on public health shall be carfully verified during the evaluation visit

14. Physical and Cultural Heritage

No risks are considered, except for the living traditions in the alpacas raising activities

15. Lands and Soil Conservation

This project, given the areas of the terrain involved in the process, the use of tools and equipment eminently friendly to the environment, as well as the use of materials native to the areas, in the various construction processes, the use of local labor for required earthworks, the use of seeds indigenous to the area, the avoidance of project location in reserved areas or ecological buffer zones, non-alteration of natural rural landscape, endeavors to make the environmental impacts minimal in the area

The process planned to undertake any necessary assessments before the full proposal stage.

Prior to the start of the full proposal stage, the following series of activities have been planned in coordination with project proponent:

1. Request from the proponent a preliminary program of project activities. The program must include:

a. The breakdown in the main groups of activities. The activities' groups will include information about the places, locales or environments in which each group of activities will be developed.

b. An established timetable per week of project execution.

c. The roles foreseen for leaders and those responible for execution and supervision of the project. The names of the candidates for fulfilling these roles.

d. The roles foreseen for the social management of the project execution and for the supervision of this management. The names of the candidates for fulfilling these roles.

e. A list of all the contacts with community leaders, local authorities, possible advisors, project consultants or contractors (including the *Yachachiqs* and training technicians), that are going to play an important role in the project or with whom agreements, partnerships and skills development activities are expected. The list will include contact coordinates (email, telephone)

f. A first draft of RBM indicators for project execution.

g. A listing of possible significant environmental and social impacts and aspects of the project, from the perspective of the project's proponent.

2. Beginning with the review of the preliminary program of project activities, the party responsible for social and environmental assessment and follow-up of the project, from the CAF team, will agree with the project's contact executive and the project's proponent on an agenda for a verification visit and the project's risks and social and environmenal impacts assessment.

   The visit will have as an objective the verification of the considerations and results of the preliminary assessment as well as evaluation and verification of the project's execution risks and possible social and environmental impacts, both foreseen in the preliminary assessment as well as others not yet considered.

   For the visit a route will be established that will allow for the identification and reconnaissance of physical and social contexts in which the project will be develooped and identification of possible risks and aforementioned impacts.

   The visit for the verification and the project's risks and social and environmental impacts assessment will include interviews with community leaders of both genders, withg community members of both genders, local authorities who are expected to play a role in the development of the project, with project contractors, advisors or consultants (including at least one *Yachachiq*).

   At the discretion of the party responsible for the assessment-evaluation, the visit can include other appropriate activities for the assessment-verification regarding compliance

with Social and Environmental Policies of the Adaptation Fund and with Peruvian environmental regulations.

After the verification and the project's risks and social and environmental impacts assessment visit, the party responsible for the project's social and environmental assessment and follow-up, from the CAF team, will issue the assessment-verification report. The report will include a draft of th Social and Environmental Management Plan for the project's development and will issue an explicit finding on the risk aspects and particular considerations in light of including other appropriate activities for the assessment-verification in compliance with the Social and Environmental Policies of the Adaptation Fund Peruvian environmental regulations.

In accordance with the results of the assessment, the aforementioned Management Plan can request the undertaking of an Environmental Impact Study, if necessary (although it is not expected to be so, in accordance with the nature of the project).

3. The draft of the Management Plan will be discussed with the project's contact executive, the project's proponent and the party from the CAF responsible for the assessment-verification of the risks and social and environmental impacts. The final version of the Management Plan will be attached to the Full Proposal to be present to the Adaptation Fund.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The project will be carried out in direct coordination with local governments of the 18 districts within the project's area of influence. Its implementation will engage stakeholders such as the Regional Government of Arequipa, local authorities, Andean camelid breeders' associations, health centers in the districts, associations and rural communities and civil society. All of this will be done in coordination with the Ministries of Environment, and Agriculture, and the National Water Authority. The Project's institutional arrangements that are designed to work through the PE COPASA in direct collaboration with the Regional Government and local governments, maintaining constant communication, and as far as possible, will be aligned with other initiatives.

Executing Entity:

The COPASA Special Project (Cooperation with the process of self-sustaining development in Arequipa), is an autonomous agency of the Regional Government, created by EO 002-97-PRES on January 30, 1997, under the Technical Cooperation Agreement between the governments of Peru and Germany. To date and in compliance with its purpose, it has Executive Management, reporting to the President of the Regional Government, and possessing technical, administrative and financial autonomy

The applicant has previous experience in technical cooperation in this topic, fulfills its function as the region's counterpart for technical and financial cooperation accords that the Presidency of the Regional Government of Arequipa entrusts to it. In its years of operation it has developed many and varied work programmes, among which we can highlight:

Integrated Food Security Programme – PISA [Spanish acronym] (1985 – 1993)

- Marginal Urban Areas Emergency Programme – PEUM [Spanish acronym] (1985 - 1993)
- Colca Valley Rural Development Programme - PDR [Spanish acronym] (1995 - 2001)
- Emergency: Post Earthquake Reconstruction Project (2001 – 2002)
- Emergency: Special Measures to Mitigate Cold Spell Effects (2002)
- Disaster Risk Management Project with a Focus on Food Security – PGRD [Spanish acronym] (2002 - 2007)
- Adaptation to Climate Change Programme (2006 – 2007)
- Access to Energy Services Programme (2007 – 2008)
- Energy, Development and Life Programme – ENDEV [Spanish acronym] (2008)
- Andean Highlands Social Development Programme (2009)
- Execution of Framework Agreement undersigned by the RGA and the UNDP (United Nations Development Programme) (2009 – 2011)
- Programme for the Installation of Improved Stoves in the Arequipa Region (2010 - 2011)
- Program to strengthen local governments, leading to participatory planning processes, and local budgeting, taking into account criteria of rationality and efficiency, guiding the implementation of projects as planned and per the approved budget (2015 - 2018)
- •Program to strengthen local governments, for them to know and apply methodologies and tools in which risk management and adaptation to climate change are incorporated, reducing their levels of vulnerability, implementing an environmentally responsible management of natural resources (2015 - 2018)
- Program to strengthen local governments, to carry out maintenance, construction and use of improved stoves, contributing to environmental improvement and sustainability of the technological proposal. (2015 - 2018)

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

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

E. Include a results framework for the project proposal, including milestones, targets and indicators.

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)[51]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)

G. 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.

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

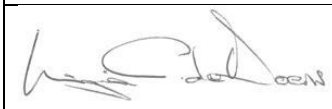
(i) [51] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

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

A. Record of endorsement on behalf of the government[52] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Viviana Grissel Zaldívar Chauca *Asesora* *Gabinete de Asesores de la Alta Dirección* *Ministerio del Ambiente del Perú*	Date: *January, 11, 2016*

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

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (General Law of the Environment, Law No. 28611; Bicentennial Plan, Peru 2021; National Environmental Action Plan - Peru 2011-2021 PLANAA); The Regional Strategy for Adaptation to Climate Change in the Arequipa region 2008-2018; The Concerted Development Plan 2013-2021 of the Arequipa Region; and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
 *Ligia Castro* *Dirección de Ambiente y Cambio Climático* *Implementing Entity Coordinator*	
Date: *January, 11, 2016*	lcastro@caf.com +57.1.743.7355
Project Contact Person: María Carolina Torres	mctorres@caf.com +52 55 11026904

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

Lima, January 11, 2016

Letter N° 002-2016-MINAM/DM/VZCH

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project "*AYNINACUY: Estrategias de adaptación al cambio climático, para la preservación de su capital pecuario y medios de vida en comunidades campesinas en las zonas altas de las provincias de Arequipa, Caylloma, Condesuyos, Castilla y la Unión, de la Región Arequipa"*

In my capacity as designated authority for the Adaptation Fund in Peru, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of climate change in Arequipa, Peru.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project will be implemented by CAF-banco de Desarrollo de America Latina and executed by Government of Arequipa.

Sincerely,

Viviana Zaldívar Chauca
Adviser Minsitry of Environment
Designated Authority