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AGRICULTURAL INSURANCE AGAINST FOOD DEMAND



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INTRODUCTION

Once again we meet the XIV World Congress of AIDA 2014, to feel united in the same desire, to be part of changing the world. The time, space, distance, people, cultures played a mother idea "The Agricultural Insurance against global food demand" topic within the international agenda is the most important in the times in which we live, and we say non-undereestimate the importance of the other.

The world faces one of the most difficult challenges to overcome, how to feed humanity without degrading the planet? Today, millions of people suffer from chronic hunger, however it does not, the global food production enough to feed everyone, inappropriate distribution prevents and even allow, escalating food prices make it impossible to acquire many. Moreover, one of the major obstacles lurking around the year 2050 is the population growth will increase in 2000 to 3000 million, so maybe double the demand for food. In this increase will contribute the highest standard of living of many people who consume more. Regarding the crops are mostly for the production of biofuels, which imposes new requirements to farms, to meet the global demand for food production will have to double. The conflict between biofuel and food is a fallacy of composition. Controversy exists since man flat land, since the agro always produced the two elements. At the time of the hunter man power needed to heat the wood came from and the remains of food. The controversy had to use wood for heating and cooking or to build houses, but such was the magnitude of the resource that the confrontation did not arise.

Humanity to deforest rainforests, marginal land and promote industrial labradfos on fragile soils and watersheds, agriculture has become the greatest threat to the environment. Crops occupy a large percentage of land area, with the consequent destruction of habitats, depletion of fresh water and pollution of rivers and seas. Also released more gases into the atmosphere that no other human activity greenhouse. To ensure the health of the planet long term it is essential to dramatically reduce the adverse impacts of agriculture.

Mankind must address three closely interrelated challenges: Ensuring adequate nutrition current 7 billion people on Earth, doubling food production in the first 40 years and accomplish both goals in a sustainable way for the environment.

A group of experts has formulated a five-point plan jointly implemented more than double increase in available food resources, as well as reduce emissions of greenhouse gases significantly, losses in biodiversity and consumption and pollution water. Modern agriculture has driven extraordinary way global development. On the other hand you can not continue to ignore its limited expandability and the growing environmental damage imposed. Studies researchers generated from agricultural and environmental data have outlined a five-point plan to address, in a coordinated fashion the problems of food and the environment:

Stop the expansion of agriculture, is to slow down and eventually leave the expansion of agricultural land, especially tropical forests and savannas. The destruction of these ecosystems are enormous and serious environmental impacts, including loss of biodiversity and increased emissions of carbon dioxide, due to removal of natural vegetation.

Eliminate disparities yields to double world food production without extending the agricultural area, it must enhance the current crop labradíos.

More effective use of resources, to mitigate the environmental impact of agriculture, more efficient farming practices should be applied.

Decrease consumption of meat, if more of our crops is devoted to directly feed people and less fattening of cattle, the global availability of food grow appreciably.

Reducing losses and waste, reduce losses and waste in the food system. About 30 percent of the food produced in the world is discarded, lost, spoiled or are consumed by parasites. Today science has an advantage over politics and shows clear progress in defining the effects of different concentrations of GHGs on the systems that support life. The fourth report of the IPCC (2007), and the fifth assessment report, seek to quantify the relationship between concentrations of certain gases corresponding to increases above 2 ° C temperature and the effects on biological, economic and human systems to guide decision makers in the adoption of policies for mitigation and adaptation.

How did face agricultural producer in the Mercosur region, the challenges imposed by climate change, compared to the production of food and what tools to use for the assessment and management of climate risk as a preventive measure be?

Address this question, we must not forget that when man becomes sedentary, begin to consider the use of energy and the need to feed, so time passes until the warming is discovered, the ozone hole and the so-called "climate change", which we believe is the effect of human activity on climate cycles, which are undoubtedly deepened by energy waste. In this research, we will develop the theme "Agricultural Insurance against the threat of global food production"

Henceforth, when we are in front of us, when it should ponder all, the owner of the work fades and loses strength until it disappears, and said Jorge Luis Borges, "When I put the last point, lose my identity and what I did belong to those who receive it"

ACRONYMS

AVHRR Advance Very High Resolution Radiometer

IDB Inter-American Development Bank

BSE BankState Insurance

COMSA Farm Security Committee

CONAE National Commission on Space Activities

CPR Insurance Certificate Product

CORFO Development Corporation Production

EGM Georeferenced Sampling Station

ENSO El Niño Southern Oscillation

FOGASA Guarantee Fund for Agricultural Insurance field and

FONEDA National Fund for Disaster Mitigation Emergency Agricultural

FRFG Fund for Reconstruction and Development of the Farm

GPS Global Positioning System

IFPRI International Food Policy Research Institute

ING National Geographic Institute

INTA National Institute of Agricultural Technology

MAGyP Ministry of Agriculture, Livestock and Fisheries

MINCETUR Ministry of Foreign Trade and Tourism

MGAP Ministry of Livestock, Agriculture and Fisheries of Uruguay

MODIS Moderate Resolution Imaging Spectroradiometer

NOA National Oceanic Administration Atmospheric

ORA Office of Agricultural Risk

POES Polar orbiting Operational Environmental Satellites

PSR Grant Program for Rural Insurance Premium

PROAGRO Guarantee Program for Agriculture and Livestock

SIIA Integrated Information System

SVS Securities and Insurance Superintendency

UTM Universal Transverse Mercator

TRMM Tropical Rainfall Measuring Mission

VBP Gross Value of Production

ABSTRACT

CHAPTER I

In Chapter I, the tools for assessing and managing climate risk, early warning systems, geographic standards for the integration of spatial data, to predict possible climate phenomena affecting agricultural production are analyzed.

Weather events that affect agriculture in Mercosur Region.

CHAPTER II

In Chapter II, agriculture was developed in Argentina, Agricultural Regions, innovative tools for assessment and climate risk management and crop insurance.

CHAPTER III

In this section, agriculture is in the Republic of Brazil, Agricultural Insurance Agricultural Regions and its implementation in the insurance market.

CHAPTER IV

In Chapter IV, the Agriculture of the Republic of Chile develops, Agriculture and Agricultural Regions Insurance, its implementation in the insurance market.

CHAPTER V

This section agriculture of the Republic of Peru is analyzed, and the Agricultural Insurance Agricultural Regions, its implementation in the insurance market.

CHAPTER VI

In this section, Agriculture develops in the Oriental Republic of Uruguay, Agricultural and Agricultural Regions Insurance in the insurance market

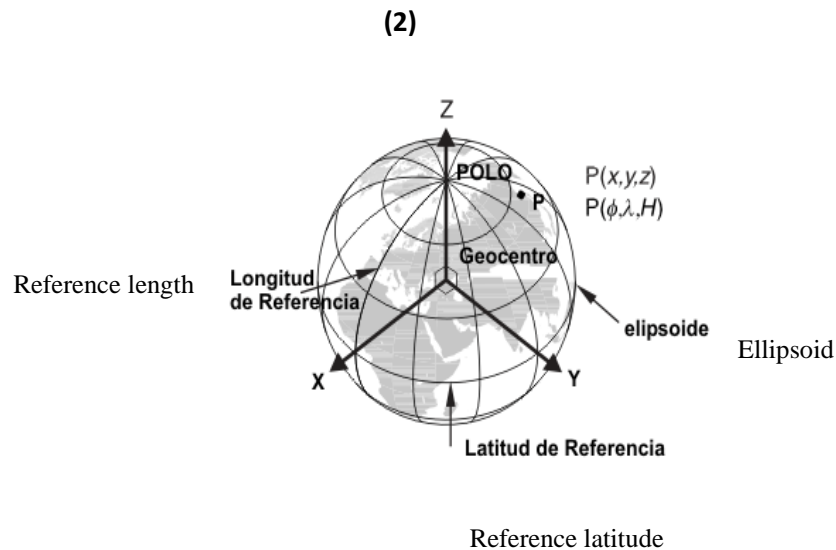
CHAPTER I

EARLY WARNING SYSTEMS

Geographic Standards for spatial data integration (1)

The Geographic Information Systems (GIS) are supported by a reference system that underpins it. This reference system consists of a set of definitions of the geometric model (shape of the earth) that wants to adopt as support thereof.

A referral system is a set of parameters that allow the location of a point on the earth's surface. The most basic system is a triplet whose geocentric Cartesian X axis is the intersection of the plane of Ecuador with the Greenwich meridian, the Y axis is also located on the plane of Ecuador but 90 ° from X axis to the east and the axis Z completes the trio on the Earth's rotation.



The geographic information is integrated to process agricultural risk analysis is transformed to digital and geodatabases related to Geodetic Reference System geocentrado in the center of mass of the earth WORLD GEODETIC SYSTEM 1984: WGS-84.

(1) -David, Arthur y Zeiler , Michael. Designing Geodatabases

(2) - www.unal.edu.co

In regard to geographic information systems, there are two types of systems that can be used in (GIS).

Geographic coordinate systems (3)

This system uses a three-dimensional spherical surface to define locations on Earth (where the coordinates are measured from the center of the Earth). The latitude and longitude define a system of spherical or global coordinates. Each point is referenced by latitude and longitude. Is generally used for presentation and for distribution and dissemination via the Internet.

The latitude refers to a series of parallel circles Ecuador. The numbering starts in Ecuador and is from 0° to $+90^\circ$ north, and from 0° to -90° south.

LENGTH refers to a series of circles called meridians. Numbering starts at the Greenwich meridian and ranges from 0° to 360° east.

The horizontal position of a point is the intersection of a parallel and meridian and is expressed in terms of latitude and longitude.

This geocentrado in the center of mass of the Earth system uses the Word Geodetic System 1984 WGS-84. The system allows to determine absolute positions (coordinates x, y, z) or relative position to a previously determined point.

2 - projected coordinate system: defined in a flat, two-dimensional, like a map printed or viewed, therefore also called map projection. A map projection uses mathematical formulas to relate spherical coordinates the globe with planar plane coordinates. This system is used during the stages of editing and GIS development or dissemination of printed maps or thematic maps.

In the Mercosur region, the coordinate system used is:

Gauss-Krüger

This projection is cylindrical, transverse and under. It was proposed by the mathematician Carl Gauss between 1816 and 1827 and in 1919 the surveyor Leonhard Krüger, Institute Potsdam proposed dividing the territory into zones with the cylinder tangent to the central meridian and a width such that deformations do not exceed values identified in advance.

With this projection which sees the Earth as a sphere tangent to a cylinder as a meridian, where the points do not suffer any deformation.

From this central meridian east and west, each strip is limited by two meridians, that distance $1^\circ 30'$ from the central meridian. This projection is used by the IGN for editing topographical charts at different scales.

Universal Transverse Mercator (UTM)

It is a cylindrical projection as transverse and therefore retains the angular relationships and has spread with the advent of GPS receivers.

At an intersection UTM cylinder used with the terrestrial sphere, so that is the central meridian for the round value of 10,000,000 m, value is known as "False northing". This established a deformation to the central meridian, is equivalent to take the value of $k = 0.9996$ in the formulas of Gauss-Krüger, which makes tangent on blotting. As a consequence of this new geometric arrangement of the central meridian acquires a minor dimension and deformation decreases away from the central meridian, allowing therefore cover a larger extension in length.

The system divides the Earth into 60 zones or belts 6th, three on each side of the meridian. The zones are numbered 1 to 60, starting from the meridian of longitude 180° east. Areas covering Argentina are 18, 19, 20 and 21 with their respective central meridian: -75 , -69 , -63 , and -57 . Each zone is divided into horizontal bands of 8° latitude. These bands are lettered from south to north, starting with the letter C to the letter X. The letters I and O are omitted to avoid confusion with one and zero. The X band is comprised of 12° instead of 8° .

In the UTM denote N and E and we also know the number of area where the point is. These coordinates are expressed as distances in meters to the east and north. The E coordinate is referenced to the center line of the area, known as central meridian. This meridian is assigned the arbitrary value of 500 thousand meters E. The zones have a maximum width in Ecuador.

Each information layer has a coordinate system. This allows reference the data of the Earth's surface and particular points of interest, and integrate the information with other thematic layers. Each project must integrate geographic data under a common coordinate system, allowing thematic integration and performing analytical operations between data.

The objective of these rules is to ensure the integration of spatial data from different sources and its compatibility with data generated by other institutions nationally and internationally. In order

to integrate data from different geographic coordinate systems, it is necessary to convert the information to a single system.

Editing	Ability to produce new information from the available geo, mapping specific areas
Selection	Search and query geographic Select by simple or complex searches of geographic features or attributes geodatabases
Determination of proximity	Analysis or nearby areas of influence between geographical elements from set distances or radii.
overlap integration	Matching spatial between different geographical elements that allows the correlation of variables by geographic location
Location	Map of objects, positions or geographic patterns related to certain risks.
Determination of areas	Determination of areas affected by certain patterns or search criteria in the available information
Detection and mapping	Of changes Mapping changes in an area to determine the impact of changes on it, for example after changing hydraulic works in the areas at risk of flooding, or anticipate future trends and needs
Density and concentration	Identification of areas with a high concentration or density of a variable
Optimal routes	Determination of convenient paths between spatially related items

Sensor networks for observation and monitoring (4)

Remote sensors are remote sensing systems for acquiring information about properties of objects, surfaces or materials through instruments which are not in contact with said object surface or material. Measure the electromagnetic energy reflected or emitted by a distant surface, identifying and categorizing patterns per class spatial distribution.

Moreover, these sensors allow obtaining knowledge of the territory, while satellite remote sensing allows through monitoring of environmental phenomena, natural resources inventory and determine the areas affected by risks and processes generated by the impact of weather.

Remote sensing is complemented and has much synergy with Geographic Information Systems (GIS) issue that we discussed in the previous section.

It is interesting to note that satellite images allow to obtain a synoptic view of each risk or process analyzed, make it a useful tool for the study of highly dynamic phenomena, such as floods, desertification, wind erosion, deforestation, large fires etc.

At the same time, the number of historical satellite data are useful for determinations of vulnerability in different industries and to determine limitations of different environments and agroecosystems.

At present it has large banks of multi-temporal data over 35 years of acquisitions of Landsat program for agricultural risk applications.

NASA's MODIS and SAC-C data is used in assessments of areas affected by risks and agricultural emergencies and regional scope.

The sensors can be active or passive, depending on whether or not their own source of radiation, respectively. Active sensors are optical with panchromatic and multispectral bands, passive microwave sensors are radar. Platforms for data collection can be satellites or air.

With respect to the sensors mounted on satellites, we can describe two types:

- 1) The geostationary orbit
- 2) quasi-polar orbit

Regarding sensors geostationary orbit, the satellite moves along with the earth always watching the same portion of the planet, providing imaging with frequency between 15 minutes to an hour, allowing adequate monitoring of meteorological events visualization of clouds, watching the water vapor in the atmosphere, surface temperatures of land and sea, determination of wind vectors, incident solar radiation, vegetation conditions, among others.

Moreover, the quasi-wave polar, is slightly offset from the meridian capturing information from east to west of different portions of the surface at the same site.

Major satellite programs quasi polar wave

POES (Polar Operational Environmental satellites orbiting)

The POES satellites are placed in service by the NOAA (National Oceanic Atmospheric Administration), noted for his AVHRR (Advanced Very High Resolution Radiometer) sensor, which was initially designed to determine cloud cover and temperature structure of the sea surface but to provide data of different bands within the visible spectrum near infrared or thermal infrared has been possible to apply in numerous studies in the field of Earth observation: clouds, lakes, oceans, vegetation, ice, snow, coasts, as well soil temperatures, water surfaces and clouds and seas building indexes combining information from different bands.

MODIS (Moderate Resolution Imaging Spectroradiometer)

The MODIS sensor is a hyperspectral radiometer on space platforms Terra (EOS AM) and Aqua (EOS PM), developed by NASA. While these platforms have other sensors such as ASTER, CERES MODIS and MISR data capture 36 channels between the visible and infrared heat at different spatial resolutions.

Products made from this information were designed for oceanographic, biological and atmospheric studies, among which we can mention:

Vegetation and land area coverage

Leaf area index

Photosynthetically active radiation

Chlorophyll

The vegetation indices are a typical product for use in the agricultural sector is developed based on data captured by these platforms.

SAC-C

It is an Argentine satellite designed and operated by the National Commission on Space Activities (CONAE) that provides data on spatial resolution of 175 m, with a sweep width of 360 kilometers and a 16-day revisit. The mission of the SAC-C covers the Earth observation and measurements for scientific purposes. The SAC-C satellite conforms with U.S., international constellation for Earth Observation.

TRMM (Tropical Rainfall Measuring Mission)

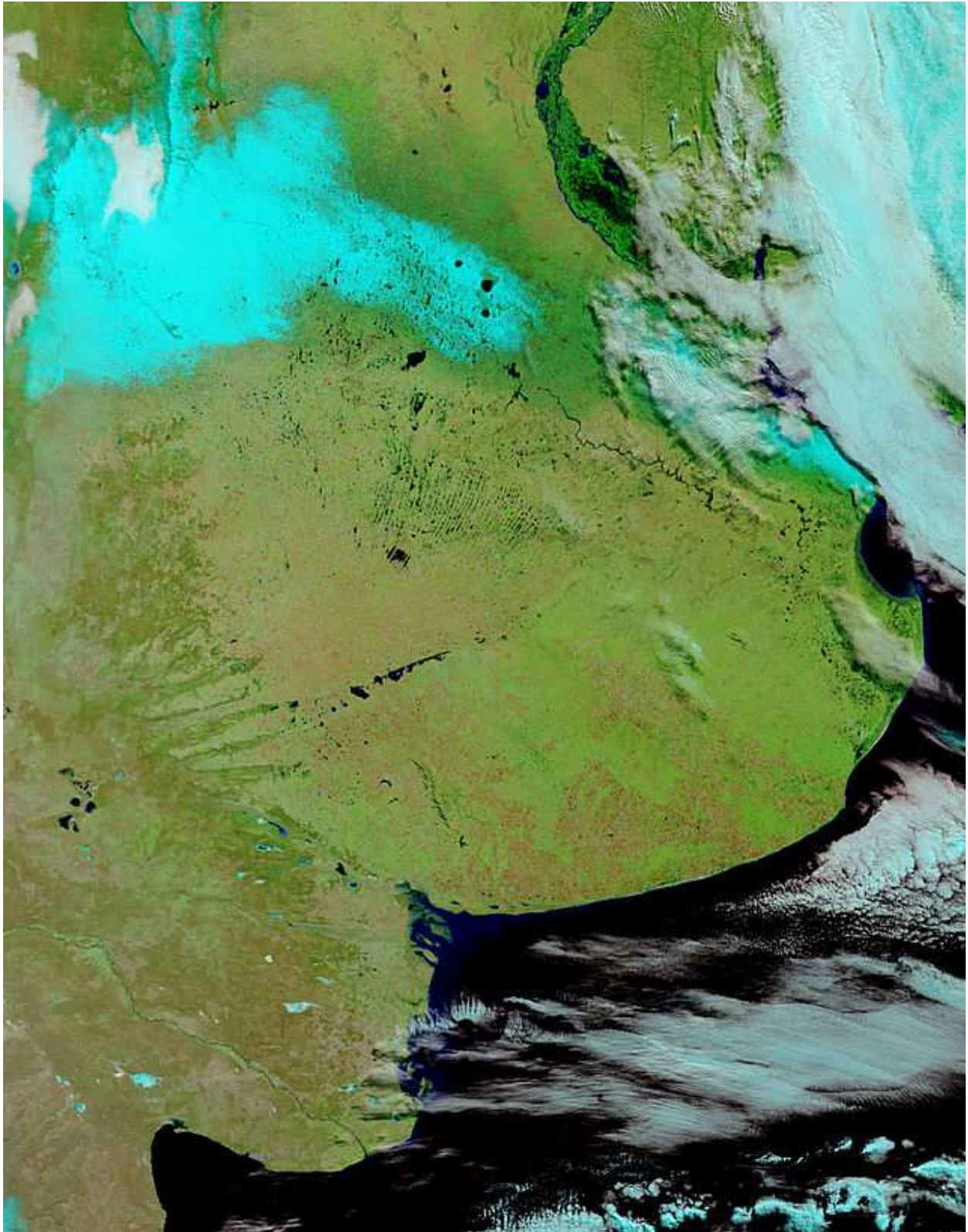
It is a satellite, comprising five unique sensing instruments, four of which are intended to produce images of clouds, rain and lightning. Shoot between latitudes 35 degrees north and south, so it is considered essential for the study of severe weather. The data sheds are very useful for mapping spatiotemporal precipitation fields.

LANDSAT

The Landsat satellites and sensors of similar resolution, are the most used to study natural resources and environmental monitoring.

The Landsat platforms dating back more than 30 years and have channels in the visible and the latest channels in the near infrared, and thermal medium and high resolution panchromatic window. Today, the missions of Landsat 5 and 7 with a temporal resolution of 16 days and a spatial resolution of 30 m pixels side still valid.

This is the optimal resolution for the development of mapping and mapping scales. They are highly effective for determining vulnerability of different areas to different risks and processes derived climate impact. One example is the determination of vulnerability and frequency of flooding and flooding.



MODIS snow (in blue) on July 10, 2007 Buenos Aires -. Argentina

CLIMATE PHENOMENA AFFECTING AGRICULTURAL SECTOR IN THE REGION OF MERCOSUR

ENSO - El Niño - Southern Oscillation (5)

The ENSO phenomenon arises from the interaction of atmospheric and oceanic factors, when installed causes alterations in the normal patterns of oceanic and atmospheric variables. The ENSO associated with an increase or decrease in the temperature of the sea surface, however it there are other changes associated with the phenomenon.

The Southern Oscillation is the atmospheric component of the phenomenon. One way to measure it is by the SOI (Southern Oscillation Index): anomaly of monthly mean pressure difference between Tahiti (French Polonesia) and Darwin (Northern Australia).

During the events of ENSO Customised is the temperature of the atmosphere. About the area ENSO air temperature at a height of 5000 meters El Niño-Southern Oscillation or ENSO is monitored occurs along the coasts of Ecuador, Peru and northern Chile and across the equatorial Pacific Ocean when temperatures up for a period of three consecutive months. When ocean temperatures fall below the average, the phenomenon is given the name La Niña.

This phenomenon is of extreme importance as a risk factor for disaster because it generates changes in climate: El Niño is associated with drought in the western Pacific, rainfall in the equatorial coast of South America (especially Colombia, Ecuador and Peru) storms and hurricanes in the central Pacific. El Niño and La Niña, usually last from 9 -12 months. Often begin to form during June-August, reach their peak during the months of December and April and then fell between May and July of the following year. However, some prolonged episodes have lasted two years. While their frequency can be quite irregular, El Nino and La Nina occurs every 3-5 years on average. Strong events can be expected approximately every 15 years. The phenomena involved can generate a surplus of rain that can produce flooding and landslides, or a lack of rainfall that generates droughts and forest fires, clear skies and frost. Rising sea levels in conjunction with winds perpendicular to the coast can cause surges to flood and erode coastal areas.

(5)- UNISDR AMÉRICA DEL SUR: Una visión regional de la situación de riesgo de desastre.

One of the indicators used to track these phenomena is the Oceanic Niño Index (ONI, for its acronym in English), developed by the National Oceanic and Atmospheric Administration (NOAA) of the United States. This index is calculated from measurements of sea surface temperature in the central sector of the tropical Pacific off the coast of South America.

In El Niño conditions, the ONI should be equal to or greater than +0.5 degrees Celsius anomaly, while La Niña conditions, the NIB must be less or equal to -0.5 degrees Celsius.

Droughts

Droughts affect almost every country in South America. Are usually generated by long periods (months or years) with precipitation deficit. Cause important economic losses and affect the lives means expansive rural communities and subsistence farming. To show susceptibility with certain parts of South America to drought then submit Severity Index Drought Palmer (Palmer Drought Severity Index), which was developed by Wayne Palmer in 1960 and uses the temperature information and precipitation in a formula to determine soil moisture. It has become the semi-official drought index.

Palmer Index is most effective in determining the long-term drying. 0 is used as normal, and drought is shown in terms of negative numbers eg -2 is moderate drought, severe drought is -3 and - 4 is extreme drought.

Extreme temperatures

The climatic diversity in South America, seasonal variations and local effects are partly the cause of extreme temperatures in different areas of the region. Extremely low temperatures (frost, cold waves) in populated areas are those that cause the greatest impacts on people and their livelihoods. Above 2.500mts frosts are more frequent and occur above the 4.500 m along almost the entire year.

A cold wave is a weather phenomenon that is distinguished by a cooling of the air. Accurate measurement of frost is determined by the ratio of the speed at which the temperature drops and the minimum temperature at which it arrives. Conditions are presented in season between May and September to frost and manifest in high plateau lands, freezing temperatures, wind and ice storms.

Earthquakes

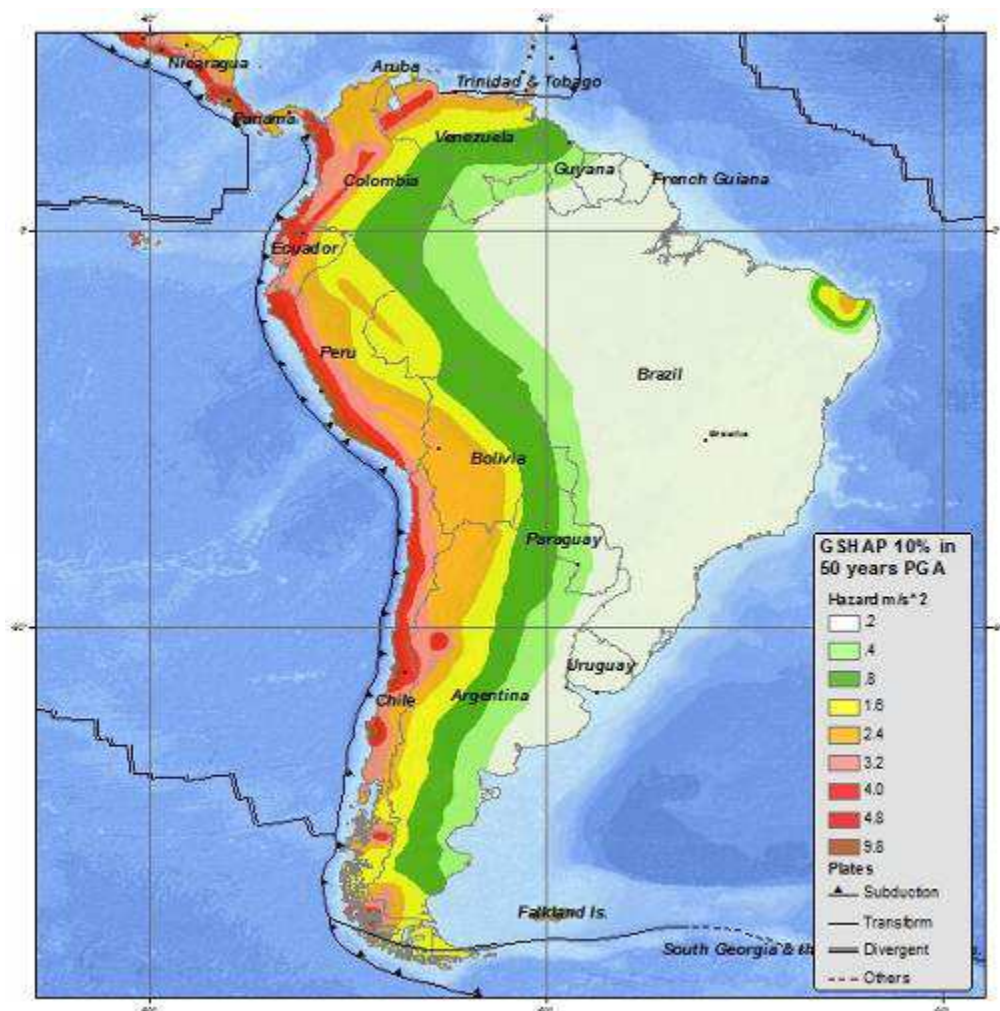
The geotectonic location of the Pacific slope of South America on the Pacific Ring of Fire makes this zone is located in one of the areas of greatest release of energy on the planet, where 80%

reported seismic activity and volcanic earth. So that the countries of South America have suffered some of the most powerful earthquakes that have occurred worldwide, such as the Valdivia that affection.

This geographic location, which sits to South America on the confluence of three active tectonic plates (Nazca, South American and the Caribbean, which can be seen in the map 9), which is also causes threat of volcanic activity and tsunamis.

Volcanic activity in South America is intimately linked with the seismic activity of the region.

Most volcanoes are in the Andes.

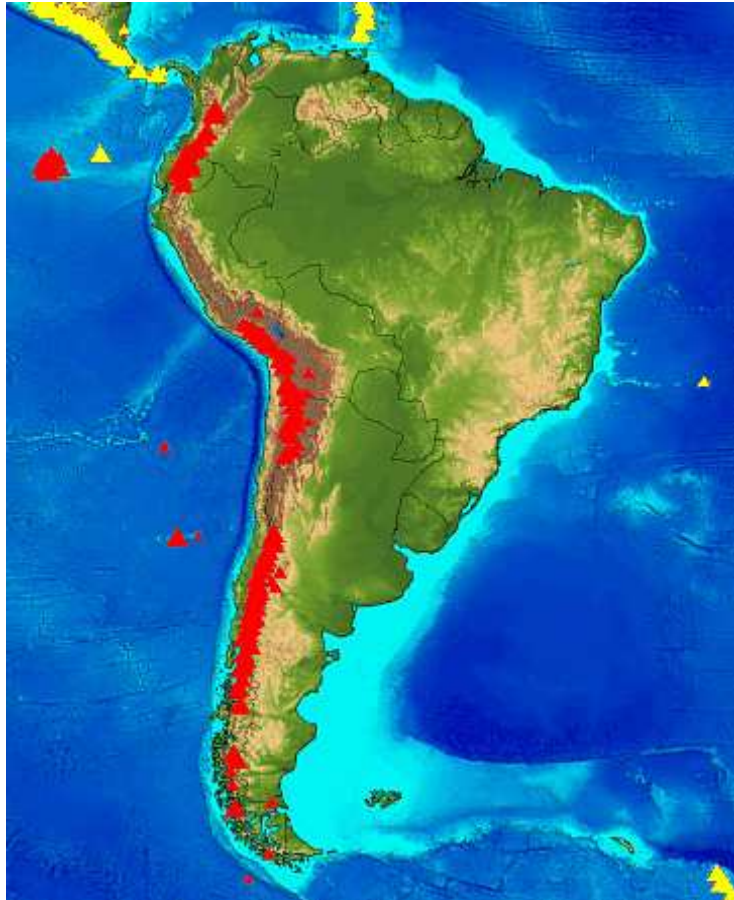


The map shows how the seismic hazard occurs in South America. The colors indicate the different levels of seismic hazard. The red color indicates high hazard and colorless areas represent regions in which there is no seismic hazard. It can be seen that the western coast of the continent presents a high degree of seismic hazard, which descends gradually (except in an

enclave east of Brazil as seen on the map), in so far as it progresses eastward of America South.

Volcanic activity in South America is intimately linked with the seismic activity of the region. Most volcanoes are in the Andes. However as can be seen in the figure below, there volcanoes in the Pacific Ocean (Galapagos Islands-Ecuador, Easter Island, Chile, Hawaii-USA) and the Caribbean Sea near the Caribbean coast of South America (Kick -em-jenny, Mt St Catherine, Montserrat).

In figure big red triangles show the assets and smaller volcanoes no recent activity report. Yellow triangles represent volcanoes in Central America and the Caribbean.



Case - Puyehue Volcano Eruption - Lase Caulle - CHILE (2011)

The eruption of the volcano Puyehue - Cordón Caulle in Chile of 2011 significantly affected Argentina way, air traffic and other countries in South America. lace Caulle, is a volcanic fissure and has erupted several times in history. On June 4, 2011 eruption began Puyehue-Cordón Caulle in Chile. At least 3,500 people were evacuated from nearby areas immediately, while the ash cloud blew across the southern hemisphere. The pen crossed the borders of Chile and precipitated the Argentine cities of Villa la Angostura, Bariloche and the northern part of the province of Chubut. The Argentine Government organized the transfer of staff of the Argentine Army, transportation and water treatment plants to affected areas on the border of Argentina and Chile. On 9 June the ash plume from the eruption reached Uruguay, forcing the cancellation of most flights. On 11 June the ash cloud reached the southern tip of New Zealand. On June 18, the ash cloud had completed its first circle to land.

This theme is developed at length in the second session of the Commission in Tel Aviv

Tsunamis

The origin of tsunamis can be diverse, such as earthquakes, volcanic eruptions, landslides, and other causes, but almost all of the reported tsunamis in South America are due to earthquakes. The map with circles represents the tsunamis reported in South America, whose colors show range reported deaths (white: no deaths, red: more than a thousand deaths). Geometric figures shown in the tsunami source (circle earthquakes, triangle volcanic eruption), the larger the circle the higher the magnitude of the earthquake that generated the tsunami. As can be seen, the western slope of South America have suffered the devastating effects of a large number of tsunamis and, to a lesser extent, this phenomenon has also affected territories in the extreme north of the continent.



CHAPTER II

REPUBLIC ARGENTINE

Geographic Location

Argentina is in the Southern Hemisphere, with respect to Ecuador. And is in the Western Hemisphere, with respect to the Greenwich meridian.

Argentina is located in the southern tip of South America. It is the second largest country in South America and eighth in the world. It has a land area of 2,791,810 km². The Argentina is bounded on the north by the Republics of Bolivia and Paraguay; south by the Atlantic Ocean and the Republic of Chile; east the Federative Republic of Brazil, the Republic of Uruguay, the Rio de la Plata and the Atlantic Ocean (Argentine Sea) and the West, the Republic of Chile.



The Argentina is characterized by the production of a variety of crops. This is possible, largely for its agro-ecological diversity, ie, the existence of areas, each with specific characteristics in terms of climate, soils and natural vegetation, suitable for the development of certain agricultural activities (selected crops) and / or livestock. In general, crops grown under two different modes of agriculture:

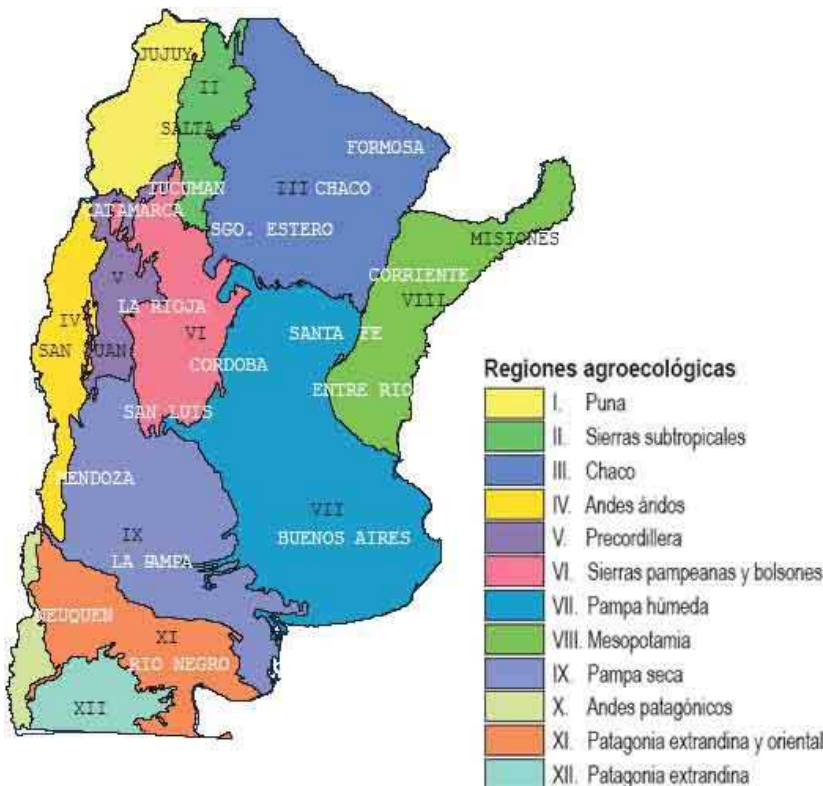
- Rainfed agriculture: is done without irrigation, only the contribution of rainwater.
- Irrigated agriculture: is from the use of river water to irrigate crops, where rainfall is

insufficient. These agricultural areas developed in arid areas are called oasis irrigation. In recent decades, the agriculture Argentina has experienced tremendous growth manifested in:

- Increasing the area under crops. This is because, in some areas, the advance of on livestock farming, a process known as "agriculturization". In other areas, is caused by the expansion of the agricultural frontier (ie, the expansion of agriculture into areas that have not been used for agricultural activities).

- The highest production volume harvested. This not only responds to the increase in the area under different crops, but also to increased yields of many of them (ie, obtaining higher production volumes per hectare).

In large measure, this agricultural expansion is explained by the spectacular growth of soybean cultivation, increased since the 1990s.



Responsible for implementing public policy agricultural risk management is the Ministry of Agriculture, Livestock and Fisheries (MAGyP), through the

Agricultural Risk Office (ARO). This office is a unit of analysis, management and proposal development related to the management of production risks, whose functions are: Develop, analyze and disseminate evaluation tools and risk reduction agriculture from a holistic perspective, and help create the right framework for expansion and diversification of insurance markets and hedging instruments for the agricultural and forestry sector.

To assess the risk factors affecting the agricultural and forestry sector (climatic, economic and market) and generating tools and strategies for prevention, mitigation and transfer of agricultural and forestry risks in coordination with public and private agencies concerned with these issues.

Analyze, develop and implement mechanisms to promote and expand to improve the conditions of access to agricultural and forest insurance, prioritizing productions and regions and active risk mitigation practices.

Develop and propose risk transfer mechanisms for the agricultural sector. Provide training and technical assistance on issues of assessment and management of agricultural risks.

Another dependency linked to agricultural risk management is the office that is responsible for the application of the Emergency Law Agricultural MAGyP. Meanwhile, the agency responsible for the regulation, and Comptroller of the insurance business is the Superintendent of Insurance's Office, under the Ministry of Economy and Public Finance Argentina also has a set of institutions that nourish the information MAGyP activities: Integrated Agricultural Information System (SIIA), the National Institute of Agricultural Technology (INTA), and the National Weather Service.

Argentina has the Agricultural Emergency Act n. # 26 509, dated August 20, 2009, this law creates, in the field of MAGyP, the National System for the Prevention and Mitigation of Disaster Emergency Agricultural, with the aim of preventing or mitigate the damage caused by climate, weather, earthquakes, biological or physical factors that significantly affect the production or capacity of agricultural production.

This law created the National Commission for Emergencies and Disasters Agriculture and the National Fund for Emergency Relief and Disaster Farming (FONEDA), whose resources will be exclusively used to finance the programs, projects and activities of the National System for the Prevention and Mitigation Agricultural Disaster Emergency. Of the 28 insurance companies that offer agricultural, five account for 62% of the insured's surface and 63% of premiums. These companies are, in alphabetical order: Allianz, La Segunda, Mapfre, Saint Kitts and Sancor. In 2008, two of the five insurance companies mentioned together about 37% of insured acres and more than 40% of the premiums. There are five other companies that also participate in the market, but in lower percentages. The companies generally cover the following risks: hail, hail with additional multi-hazard and agricultural fires in forest plantations. In 2008, five companies covering livestock risks; in 2010, this figure was reduced to three companies. In the 2011-2012 campaign, the agricultural insurance market reported approximately \$ 264 million, reaching about 20 million hectares insured, which represent 60% of the cultivated land area.

Among the different types of insurance, the most important in the agricultural branch of Argentina is Damage Insurance, the coverage being compensated for damages caused by the most widespread hail. In this traditional insurance have joined other risks: for example, damage, commonly known as "additional" heavy hail, icy winds and fire. Total insurance companies in all branches authorized to operate at 30 June 2012 was 180. Among them 104 are engaged or Mixed Heritage Insurance, of which 29 entities operating in the Agricultural and Forestry sector.

Three insurers account for 50% of total production of agricultural insurance, operating risks hail mainly for cereals and oilseeds in Buenos Aires, Cordoba and Santa Fe hail risk remains the most coverage in the market, accounting for 61% respect of all risks insured. While those who offer cover against hail with additional (wind, frost, etc.). Reach 33%. The multi-risk insurance insurance-performance-reach 6% on the total. While most companies offer traditional policies of hail, only 8 offer multi-risk coverage.

Other types of coverage related to agriculture such as cattle theft, fires in forest plantations and silos, represent less than 1% of total net written premiums in the insurance sector. With respect to the insured production, annual crops constitute a large majority, primarily Oilseeds with 57% of premiums (11.9 million hectares of oil are insured) and cereals with 36% (7.2 million hectares covered). In the past year, has fallen into the category Snuff participation, particularly when claims reported, with an increase in the overall accident rate, which exceeds 100% in perennial crops.

An analysis of annual variables, although oscillations are present due mainly to climatic prospects campaign affecting demand hedging by producers, the insurance market shows an increasing trend in recent years, mainly noticing the growth in the sum insured and premium volume, beyond the particularities affecting both the supply and demand of insurance in each of them.

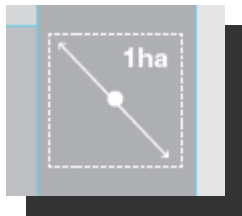
There, other tools for assessment and management of climate risk, which the farmer can determine the success of the harvest. We consulted Solapa4, Enterprise Technology Services for Agriculture without borders and constantly evolving, formed by a group of professionals with experience and recognition in the market, whose mission is to improve the process of decision making in complex environments to assist in the global challenge of creating quality food for mankind

What Flap 4 offers?

Interactive Reports on the development of culture-based Integrated Sensor Information (EGM's) Remote (Green Index Modis)

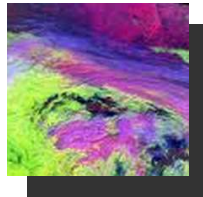
What is EGM? Georeferenced Sampling Station

It is a Georeferenced point that identifies and represents a specific area. It is in these areas that integrate information from satellite images (1 pixel Modis 6 acres and on which we will capture information.



EGM's

+



IV MODIS



The User identifies their items and draw the points (EGM) on representative places.
Then enter the data:

1. Growing
2. Genotype
3. Planting Date

Interactively displays the following reports:

1. Green Historical Index (from 2001 until now).

Benchmark against the average area

1. Green Monthly Index as the crop grows.

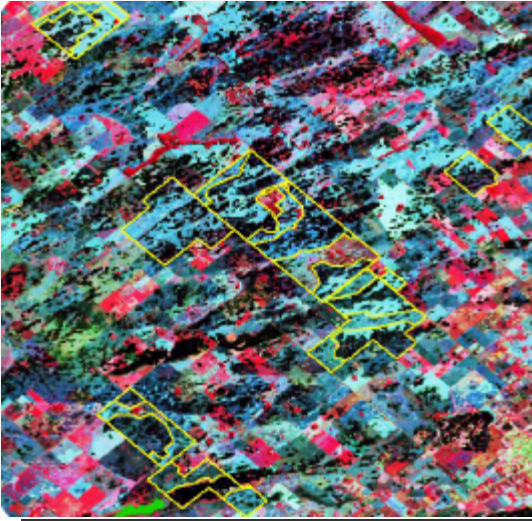
Benchmark against historical curve zone.

Benchmark against historical point curve.

Benchmark against the average of the area for that campaign.

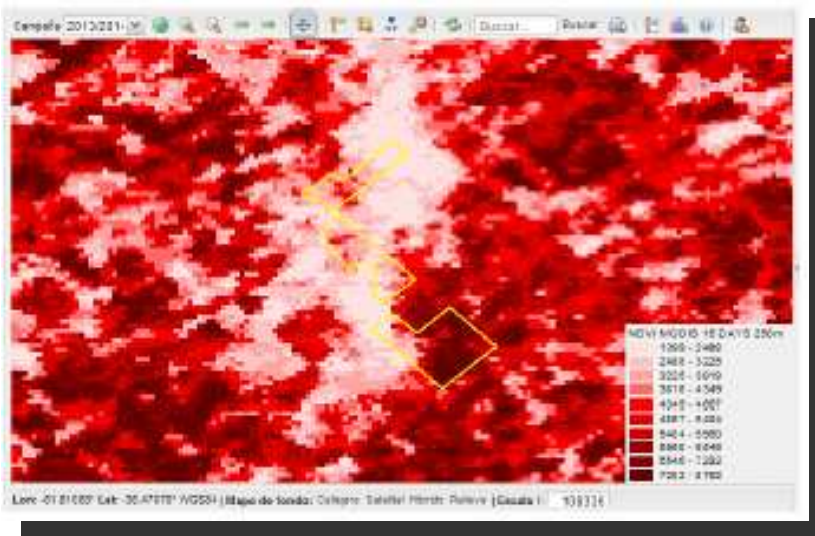
The monthly report, enables farmers to create, visualize the evolution of the production month to me.

Event Tracking

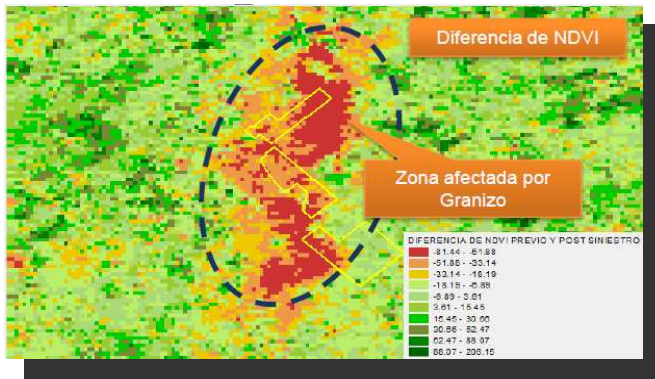


Report a flooded area

Level area / commercial centers / branch



Report hail zone level / department / branch



Green Map Index between pre and post dates for areas declared disaster with hailstones

This system allows assessment tools:

Compare the monthly evolution

Anticipates yields

Improved time management

Reduce the cost of field trips to assess the evolution of culture

Parametric Insurance

It is based on weather index insurance. Despite its increasing penetration in the world, this insurance also called parametric, not used in Argentina.

Advantage

The payment of compensation is based on the behavior of a variable
No field survey

The cost of term insurance is less than the coverage of Square

Has lower management costs

Moreover, the National Institute of Agricultural Technology Rafaela Santa Fe Province, presented a draft Security based on climate index for soybean production. (7)

The insurance is designed to match the behavior of the rains in the place between the agricultural campaigns 1931/1932 to 2009/2010. The cover design for the drought period, the dates of beginning and end of the drought were established taking into account the most common agricultural practices in the region. "Drought event" was defined as accumulated during the coverage period rainfall was below 130 mm.

7 - Instituto Nacional de Tecnología Agropecuaria de Rafaela Provincia de Santa Fe

This value, called trigger rate was used to retrospectively estimate the compensation that would have taken place between 2009/2010 and 1931/1932.

The biggest challenge lies in the correct selection of the parameters used and assumptions about the future behavior of the rains, which will determine the insurance premium. Insurance is design for first occupancy soybean area Parchment, Province of Buenos Aires (33 ° 54'40.78 "S 60 ° 36'22.49" W), a crop that occupies 57% of the agricultural area compared to 16 % with soybean or 15% corn. The choice of this site was based on the availability of information and the fact that the risk associated with changes in the amount and frequency of rainfall is perceived by farmers as a zonal relevant problem for the next 10 years (Cabrini and Calcaterra, 2008). Additionally, this is an area where there is high willingness to making agricultural insurance. For example, in the hood 2006/2007 95% of the soybean area was secured hail at an average yield of 25 tons / ha (Cabrini and Calcaterra, 2008), the zonal average yield of 32 tons / ha (2007/08 bells 2009/10 SAGPyA). For the design of coverage following parameters were considered.

- Covered climate Event: Deficit of showers.
- **Weather Station Reference:** rainfall data from the meteorological station of the National Institute of Agricultural Technology (INTA) of Parchment network belonging to the precipitation rate of the National Weather Service (NWS) were used. The data cover the period July 1931 - June 2010 and presented the following distribution: i) median annual 943,10 mm; ii) quartile 1: 802.3 mm; iii) quartile 3: 1134.10 mm; iv) Maximum: 2014.6 in the period July 2006 to June 2007; v) Minimum: 511.9 mm between 1949-1050.
- **Coverage Period** (pc) is the period measured in days, during which the occurrence of the covered event climate is liable to be compensated. The coverage period proposed - 21 December to 20 February - was specified from the phenology developed by the ORA for soybean first occupation in the region Buenos Aires Norte (where it is parchment), considering the critical period of deficit rainfall maturity groups of more soybeans planted in the region
- **Climate Index:** daily rainfall accumulated during the period of coverage, expressed in millimeters (bcf) were considered. To calculate the cumulative rainfall, daily rainfall values were truncated at 70 mm (maximum allowed), assuming volumes above this level are lost by precipitation runoff.
- **Index trigger (mmd):** The value accumulated during the coverage period (bcf) compensatory mechanism that activates the rains. The value used mm- -130 was selected so that the insurance guarantees between 20 and 30% of the water requirements of the soybean crop top, in the region of study vary between 450 and 650 mm, respectively (Andriani, 2000).
- **Output Index (mms):** The index value below which 100% of the sum insured is

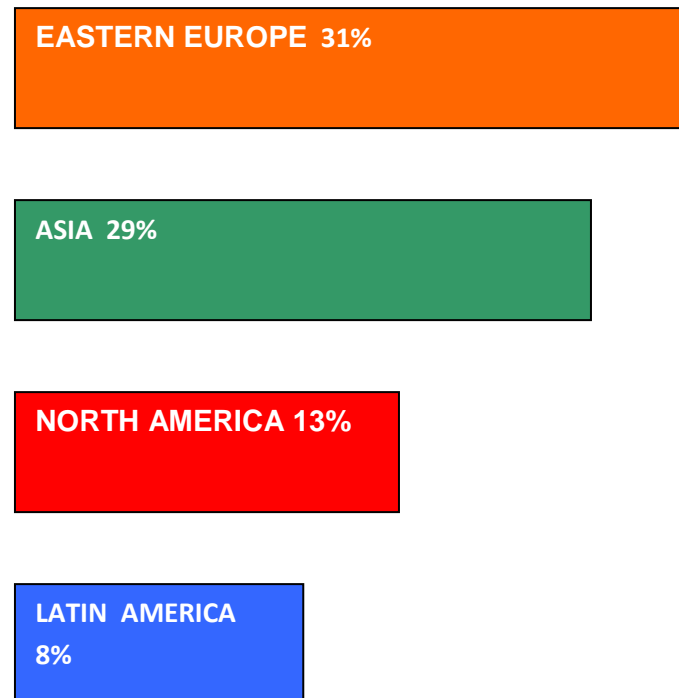
indemnified. I was selected considering the minimum value of mmpc Parchment registered during the period 1931-2010, rounded to the nearest whole number mm-50.

- **Sum insured:** The capital on which the compensation is calculated.

MARKET TRENDS IN FOOD

With respect to trends in the development of cereal-based foods, we consulted Granotec Argentina, a Chilean company with representation in Buenos Aires. According to the study conducted by the firm, the conditions during the growing season of wheat 2013/2014 were important in performance, only two subregions numerically surpassed the average with respect to the registration of five previous campaigns. The ground water resources and drought was enough this occurred west. Currently, there is a strong trend towards changing habits, food trends and new nutritional regulations.

With respect to food consumption of cereals in the world, the following trends are recorded.







CHAPTER II

FEDERAL REPUBLIC OF BRAZIL

Geographic Location

Brazil is the largest country in Latin America and the fourth largest in the world. Its boundaries are: to the south, Argentina, Uruguay and Paraguay; east, the Atlantic Ocean; north, Venezuela, Colombia, Guyana, Suriname and French Guiana; and west, Bolivia and Peru.



Brazil has a land area of 8.5 million km², occupies 47% of the South American territory. It is the fifth most populous country with 200 million inhabitants.

Brazil has 22% of the planet's arable land used for agricultural production 64 million hectares. Currently is the largest producer of coffee, orange juice and sugar, and the second largest producer of soybeans and products of relevance among others are found corn, snuff, tropical fruits, wheat, cocoa and rice. He is currently the third largest exporter of agricultural products and the first exporter of soybeans. Agriculture accounts in Brazil, about 10% of BIP.

the Brazilian Central Plateau. Mixed forests of palms, semi-deciduous forests, lianas, bamboo forests and related areas are also important vegetation types.

The 'Caatinga' semiarid

This area of uncertain rainfall covers all states of the Northeast and northern Minas Gerais, occupying 11 percent of the country (about 1 million km²). It is a vast area comprising semiarid steppe ('brejos') thorny bushes ("Caatinga") and dry deciduous forests ("Caatinga high"), and isolated patches of rainforest and rocky outcrops ('lajeiros'). Inside, the "Sertão" of northeastern Brazil, is characterized by the occurrence of fine vegetation 'Caatinga' semiarid. The highest areas or "Agreste" which are subject to less intense droughts, are located near the sea. The transition between the "Caatinga" and "Amazonia" is known as mid-north or "two Cocais Zone" (palm area). Suffering from prolonged droughts, desertification, soil erosion and salinization, 'Caatinga' has lost 50 percent of its native vegetation. Extensive cattle breeding, agriculture, resource extraction and production of subsistence were all significant impacts on this biome. Hunting for food is an important additional factor, especially in the dry season.

The "Closed"

The "Closed" is located in the central Brazilian plateau. The continuous area of "Closed" corresponds to 22 percent of the country (about 1.9 million km²) and there are also large patches in the Amazon, some small in the 'Caatinga' and also in the Atlantic forest. The climate has two very different aspects and defined. The season of 'water' and Station 'dried', corresponding to the wet and dry seasons, respectively, which are very well defined. The "Closed" has varied physiognomies from open areas lacking woody vegetation up to 'Cerrado', which are dense tree formations. The area is covered by forests and dendritic trails follow streams, moorland and includes high altitudes.

The biome "Closed", which has undergone enormous expansion of the agricultural frontier in recent decades, and has lost more than 40 percent of its native vegetation through the expansion of crops, livestock and increased human population. More than 50 percent of the

remaining natural ecosystems have been degraded. Burning for both the maintenance and creation of pastures for livestock and plantations, is a common practice and results in soil erosion and severe losses of biodiversity. Economic activities of any kind are present throughout most of the remaining area.

The Atlantic Forest

The Atlantic Forest, including the semi-deciduous seasonal forests, the forest was originally larger latitudinal extent of the planet, ranging between 6 and 32 ° S latitude (Joly et al., 1999). The forest once covered 11 percent of the national territory, but its size is smaller today, due to centuries of deforestation. Currently the Atlantic Forest has only 4 percent of its original area remains and only 1 August, 75 percent of the original forest cover (the area of the Atlantic forest in the above map is the original area, now there are only a few patches of forest). There is a large climate variability interspersed throughout its distribution, from super-humid temperate climates in the far south to tropical humid and semi-arid in the north. The irregular topography of the coastal area adds further variability to the ecosystem, which includes mountains, levees (coastal forests and shrubs on sandy soils), mangrove jungles of 'Araucaria' and pasture area in Campos south. On slopes the forest is less dense due to frequent falling trees. This is one of the most important reservoirs of biodiversity in the country and the world.

The 'Pantanal Mato-Grossense' »

The Pantanal is the largest plain subject to regular flooding the planet, mostly covered by open vegetation, which occupies 1.8 percent of the national territory. This ecosystem is composed mostly of sandy soil, covered by different physiognomies due to the variety of micro-relief and flood regimes. The main vegetation is savannah, savanna parkland (clean field), evergreen gallery forest, semi-deciduous forest seasonal and Chaco. As a transition area between the Cerrado and the Amazon, the Pantanal contains a mosaic of terrestrial ecosystems. The farm becomes the main economic activity, with livestock on native grasslands floodplains, revealing that the earth is not a swamp despite their misleading names.

Other training

Fields South (Zone Campos or Pampas)

Campos area occurs in the sub-tropical climate of the south end and represents 2.4 percent of the vegetation cover of the country. The open lands of the plains and plateaus 'gaucho' (native of Rio Grande do Sul and 'coxilhas', a gently rolling terrain, are colonized by pioneer species of field forming vegetation of open savannah and steppe. There are areas of seasonal forests and fields covered with grass-woody. predominant physiognomy of these fields is herbaceous, with many species of Poaceae, Asteraceae, Cyperaceae, Fabaceae, Rubiaceae, Verbenaceae and Apiaceae (Ministerio de Meio Ambiente, 2000). The average height of this continuous cover, sometimes dense, is 40 to 60 cm, sometimes 1 m. this area extends into Uruguay and Argentina, totaling 450 000 km² and 65 million feeding ruminants. Considering the climatic and soil conditions of this ecosystem, you might expect it to be covered by subtropical forests and not dominated by herbaceous formations. probably these are remnants of extensive pastures semiarid climate that has dominated the region during the quaternary climatic changes.

Jungle "Araucárias»

The plateau in southern Brazil, with altitudes above 500 m, is the range of "pinheiro (pine) do Paraná", *Araucaria angustifolia*, which holds 2.6 percent of the national territory. In this forest, temperate representatives coexist tropical flora and being dominated, however, by the "pinheiro do Paraná". The forests range in tree density and height of vegetation and can be classified according to aspects such as alluvial soil along the rivers, submontañosa (which no longer exists), and mountainous, the main dominating the landscape. The open vegetation of grass-woody fields occurs in surface soils. Due to the high economic value of the forests of pine "Araucaria" are subject to intense pressure to cut.

Coastal and Island Ecosystems

Coastal ecosystems are generally associated with the Atlantic Forest because of its proximity. In the sandy soils of the coastal belts and dunes have developed sandbars. They vary in shape from a low shrubby tree. The "manguezais" (mangroves) and saline fields fluvio-marine

origin, have been developed on saline soils. In sandy or muddy plains of the continental shelf occur underwater ecosystems. In the next area are the beaches and rocks, colonized by algae. The islands and reefs are remarkable geographical features of the landscape.

Brazilian biodiversity

Brazil is the country with the richest biodiversity in the world (Brazil, Convention on Biological Diversity). At least 10 percent of amphibians and mammals in the world, 27 percent of primates and 17 percent of all bird species occurring in Brazil. Regarding the flora, there are 50 000 to 56 000 described species of higher plants, or 22-24 percent of the world's species of angiosperms. By way of comparison, it is estimated that in North America there are 17 000 species, 12 500 in Europe and in Africa is considered to occur between 40 000 and 45 000 species. Not only the number of species is high, but also the level of native species (endemism).

The size and complexity of Brazil's biodiversity, both marine and terrestrial, may mean that will probably never be fully described. Officially recognized five major biomes. The Amazon biome comprises 40 percent of the rainforests of the world, being the largest rainforest left in the world. The Cerrado is the largest savanna in a single country. The Atlantic Forest extends from south to north covering an area of 1 million km². This biome currently includes the Golf, covering 13,608,000 hectares of natural pastures in southern Brazil with over 400 species of grasses and legumes 150, which is not officially recognized as a biome. The Caatinga is a vast semi-arid area of about 1 000 000 km², contrasting with the Pantanal and 140 000 km² of wetlands. Coastal and marine biomasses add up to 3.5 million km² under Brazilian jurisdiction. There are numerous subsystems and ecosystems within these biomes, each with unique characteristics; conservation of ecotones (transition areas) between them is vital for the conservation of biodiversity.

Recently, Brazil has made great efforts to preserve biodiversity. Currently, 130.55 million ha, or 15.37 percent of the area of Brazil have been legally declared protected. Moreover, 200,000 records of plant germplasm are being conserved across the country (24% are native species). Brazil has 22% of the planet's arable land used for agricultural production 64 million hectares. Currently is the largest producer of coffee, orange juice and sugar, and the second largest

producer of soybeans and products of relevance among others are found corn, snuff, tropical fruits, wheat, cocoa and rice.

He is currently the third largest exporter of agricultural products and the first exporter of soybeans. The evolution of insurance in Brazil shows a market that is under development, with a culture Insurance still forming.

The regulatory framework for insurance in Brazil is given by Law 10,823 of 2003 that creates a financial incentive for the producer and establishes general provisions and duties of public entities for the proper functioning of insurance.

At the same time, there are two complementary laws, Act 126 of 2007 by which the opening of the reinsurance market and Act 137 of 2010 authorizing the Federal Government participation in a fund to cover additional risk is promoted rural insurance. Act 5969 of 1973 PROAGRO administered by the Central Bank of Brazil and PROAGRO MAIS designed to help small farmers.

Support programs for the Rural Insurance (7)

- Increase plantings insurance coverage
- Improve access to rural credit
- Reduce demand for rural debt renegotiation
- Induce the use of appropriate technologies

Programs to support rural insurance in Brazil

- PROAGRO: assurance program for agriculture and livestock. It is linked to agricultural credit.

(7)- www.ora.gov.ar

The federal government pays the financing for losses. Administered by the Central Bank. It is a program of agricultural insurance.

- PROAGRO MAIS: Family Agriculture - Ministry of Agrarian Development.
- PSR: Grant Program to Rural Insurance premium. (Law 10.823) Ministry of Agriculture, Livestock and Supply (MAPA). Private insurers involved.

There are other types of insurance such as:

- Insurance Pledge offered as rural agricultural credit guarantee
- Insurance Real agricultural farms that have not been offered as collateral for credit.
- Certificate of Insurance Product Rural CPR

GRANT PROGRAM FOR RURAL INSURANCE PREMIUM (MAP)

This program has a differential subsidy culture can go from 30 to 70%. This program is supported by some States to further subsidize the premium, so that the farmer can pay in some cases only 25% of the value of the premium. Insurance is oriented agriculture, livestock, forestry and aquaculture.

+ **Insurance Subsidy.** The Ministry of Agriculture pays part of the cost of insurance producer

Who is eligible? A producer, a natural or legal person who produces any species included in the program. Agriculture, Livestock and Supply (MAPA). Private insurers involved.

How Contract? Through accredited insurers to operate the program

INSURANCE MARKET IN BRAZIL

Currently there are six insurance companies offering agricultural insurance. Among the most important are Alliance do Brasil, Nobre, Mapfre, SBR, Allianz, Porto Seguro. Over 60% of Private Market Farm Insurance is an insurance-linked Canal Bank. The offer of insurance is limited finding limitations on commercial channels for dispersion. Despite this growth in premium volume issued (R) shows an exponential growth in the last five years: 1.461%. Field crops (grains) are mostly covered under multi-risk coverage (over 65% of insured risks).

The concentration of operations in southern and southeastern Brazil, which accounts for 75% of insurance. The department of Paraná (PR) alone accounts for 35% of the insurance and the highest percentage of subsidy. The main crops particularly in the states of Parana and Sao Paulo in soybeans, corn, wheat, followed by fruit and vegetable crops. There are excellent opportunities for growth (less than 15% of the total planted area is assured).

Strategies to growth for rural insurance in Brazil Higher credit limits for crops insured
The cooperation of state governments grant programs

Financing the share of non-subsidized insurance premium agroclimatic zoning

Incorporation of Disaster

Construction and maintenance of a database





CHAPTER IV

REPUBLIC OF CHILE

Geographic Location

Chile is a country located in the southern hemisphere. Chile borders Peru to the north, the east by Bolivia and Argentina, south to the South Pole and to the west by the Pacific Ocean. Its land borders totaling 6339 kilometers. Continental Chile totaled 776.4 755 km of the national territory.

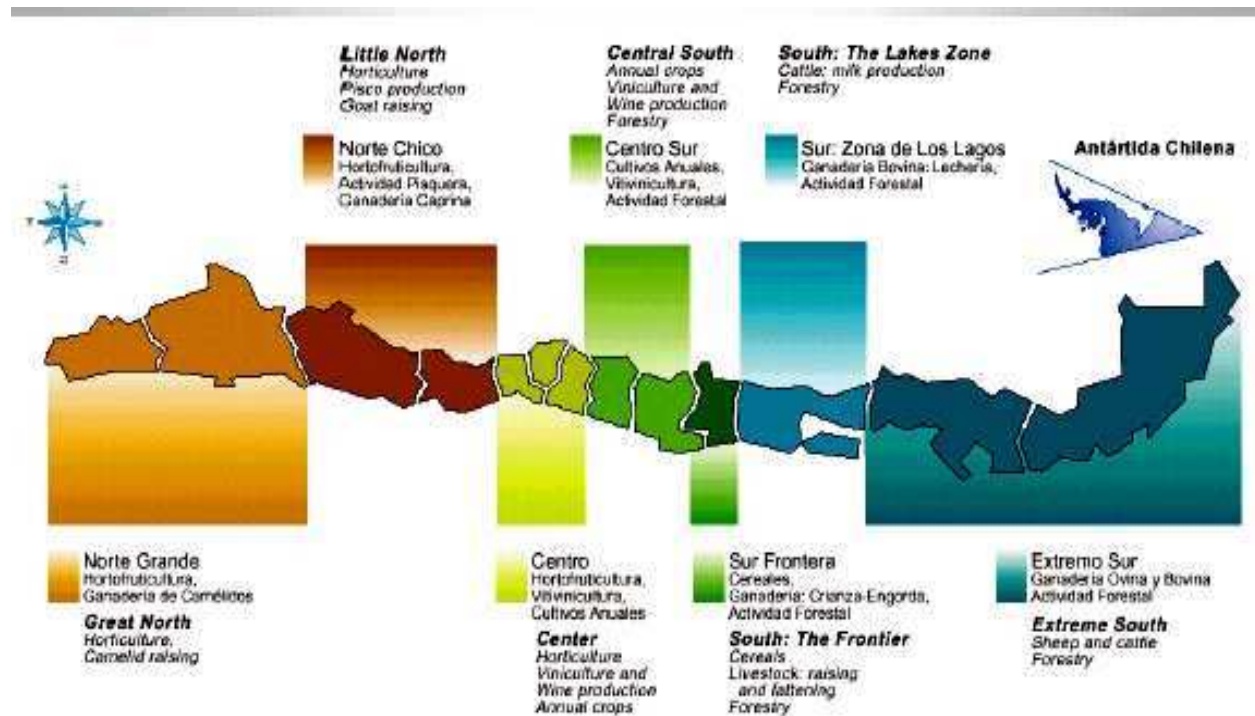
Oceanic Chile (includes insular Chile continental -the Juan Fernandez archipelago and islands Desventuradas- oceanic insular Chile -the Easter Island and Salas y Gomez Island) adds 320 kmLa Zona Norte has a desert climate warm. Its main natural resources are natural saltpeter, copper, iron, lithium and other minerals, agricultural valleys and seafood. The Central Zone is characterized by mild and temperate climate with winter rains. Its natural resources are agriculture, horticulture and viticulture in particular, livestock, forests, hydropower (rivers), copper and seafood.

The South Zone has a mild and rainy. Its natural resources are shaped by agriculture, livestock, forestry, hydropower (rivers) and marine products.

The southern zone with cold steppe climate. It has natural resources such as forests, oil, natural gas, coal, limestone, sheep and seafood.



Agricultural Regions



The relief is a major geographical feature in the settlement and in the economy. Chile is a country of mountains, plains account for only twenty percent of surface. This feature strongly influences the distribution of the population, which is concentrated on the coastal plains and the central depression. Only in the northern desert, where rainfall create a strip of grassland above 2,500 m. above the sea, there is high human population.

Chilean mountain, located in temperate environments, does not favor the settlement, however it plays a role as a generator of precipitation. His character reserve water and snow causes rivers that supply the central depression and enables the generation of electric energy. In addition, the mountain contains substantial mineral treasures. The mountain is an essential element in the functioning of Chile's geographical system.

In the central area, the plateau gives way to the Longitudinal Valley, about 965 km in length and a width ranging from 40 to 80 km, which is the most populous area. The fertile area between the Aconcagua and Biobío rivers is the agricultural heartland of Chile. The central

Andes are less wider and lower than the northern; here are the most important border crossing of the Andes and the country.

Approximately 15% of the Chilean labor force is engaged in agriculture, and agricultural products account for about 10% of gross domestic product (GDP). Except for sheep farming, which predominates in the south of the country, the bulk of Chile's agricultural activity is concentrated in the Longitudinal Valley. The main agricultural products are wheat, potatoes (potatoes), sugar beet, maize, rice, tomatoes and oats. The fruit sector is very important and includes grapes, melons, apples, peaches (peaches), apricots (apricots), plums and cherries; The country also has a prestigious wine industry

In the 2011-12 season cultivated area in Chile reached 689,451 hectares. Industrial crops cultivated a whole increased 14.6% totaling 91,143 hectares.

Farm Insurance (9)

The Crop Insurance is a risk management tool, created by the Ministry of Agriculture, led by Agricultural Insurance Committee (COMSA) and operated by the insurers. This insurance has a state subsidy is a fixed amount per policy 1.5 UF's financing 50% of the value of the net premium with a cap of 55 UF per farmer in each agricultural season. Thus in the case of small farmers the subsidy reaches a figure close to 80% of the value of the premium. The insurance covers risks following nominees: agricultural drought (rainfed), excessive or untimely rain, frost, hail, snow and damaging wind, that is, all risks from weather events. Excluded from coverage those not described above, such as the biological process own losses, poor agricultural practices, cataclysms, earthquakes, volcanic eruptions, overflow channel not attributable to excessive rainfall, among others.

The value of the insured amount is the maximum that the insurance company can pay for compensation, and this product was obtained as the result of the multiplication between the secured area, two thirds of potential yield and the price of the subject matter insured, multiplied

by the prime rate plus a fixed amount of 0.6 UF determines the premium or cost of insurance.

The premium rate has a maximum reference value previously determined by the Insurance Committee

Agricultural via Subscription Standards issued in each agricultural season. These reference values are set according to the type of crop, the municipality in which the subject is secured and the condition of irrigated crop

The Ministry of Agriculture implemented a management policy and management of climate risks, since late 2000 in the field of public policy defined two basic issues:

- 1) Operation of Security, which correspond to the general private insurance companies under applicable laws and regulations under the supervision of the Superintendency of Securities and Insurance (SVS) are the companies that take the risk transferred by farmers.
- 2) The State shall participate through co-financing of the cost of insurance premiums or without assuming any of the risk.

The Agricultural Insurance climatic phenomena arises in the Ministry of Agriculture and allows farmers to transfer the economic losses resulting from damage occurred in an insured crop due to those covered by the policy climate events. Thus, the farmer gets the direct costs of production, improve their financial stability, continuity and allows farmer and protects your work and your family.

The Crop Insurance has a state support for the copay insurance premiums and thereby facilitates access to crop insurance to all farmers, regardless of size. The beneficiary of this state grant is the farmer and the Committee on Crop Insurance (COMSA) created by the Corporation for the Promotion of Production (CORFO), is responsible for the administration of this premium subsidy.

The State support is equivalent to 50% of the net premium over UF 1.50 per policy and all with a cap of 80 UF per farmer per agricultural season. Until June 30, 2010 for wheat and rice is equivalent to 75% of the net premium over UF 0.60 per policy and with the same top 80 UF per farmer per agricultural season.

The Agricultural Insurance currently has the following coverage Climate risks. Drought (rainfed, frost, excessive and untimely rain, damaging wind, snow and hail are added at low temperatures rice flowering onion and garlic and guard the curing

period.

Zones: Communes activity between the regions of Coquimbo in the north and the south Lakes. Furthermore, Azapa, Lluta and Chaca in the region of Arica and Parinacota, and valleys of Copiapo (3) and Vallenar (3) in the region of Atacama.

Items: The majority of cereals, industrial crops, vegetables, legumes, tomato greenhouses and other vegetables, seed grain and potatoes guy. In Fruit, vines (table grapes, vinifera and pisco), apples, avocados and blueberries soon.

CULTIVATED AREAS OF CHILE





Vides del Valle del Elqui



CHAPTER V

REPUBLIC OF PERU

Geographic Location

Peru is located in the central and western part of South America, is composed of an area of a surface area of 1,285,215.60 km²

Peru is bounded to the north by Ecuador (1520 Km From border.) And Colombia (1506 km border.) on the east, Brazil (2822 Km De borders.), with Bolivia (1047 Km De borders.) on the south by Chile (169 Km. De and on the west by the Pacific Ocean (3080 Km.).



The agricultural sector plays an important role in the economic activity of the country, its share in GDP is 9%, occupies about 35% of the economically active population (PEA) national and produces 70% of food consumed in the country. Their performance was good in relation to the overall GDP, despite floods and El Niño that affected the sector in 1993 and 1998, and falling agricultural commodities borders.

Peruvian agriculture in general, is a parceleros economy where 85% of farmers have plots under 10 hectares (ha), production units to predominate between 3 and 10 ha (33%). There are 5.7 million rural land, of which only a third are inscribed on public records. Splitting into small

plots and smallholdings their wide dispersion limit production efficiency and raise costs of transport. The poverty of the majority of peasants and small farmers can be explained by the misuse and degradation of productive natural resource base.

The Operational Export Plan of Agriculture-Agribusiness Sector prepared by the Ministry of Foreign Trade and Tourism (MINCETUR, 2004) states that Peru is a sleepy agricultural power, since 7.6 million hectares suitable for agriculture only 5 million are in use and 1.7 million irrigated, with other dry and deserts, requiring investment in irrigation. In addition, 95% of the agricultural area is composed of smaller farm units 10 and 85% have less than 5 hectares, and the average of 3.1 hectares, to be competitive you need to be organized and trained agricultural unit.

The health and nutrition of the population have a fundamental role in the processes of development. The main challenges are to achieve food and nutrition security of the population (availability, access, use and stability in the food supply) and improving human capital. Therefore, the State is implementing policies such as the National Agreement, Letter of Social Policy 2001-2006, Basic Law on Decentralization, Organic Law of Governments Regional, Organic Law of Municipalities and Strategy Basis for Poverty Reduction and Economic Opportunities for the Poor. Internationally, he has made commitments as the World Declaration on Nutrition, Rome Declaration on World Food Security, the Millennium Declaration. He also has signed the Declaration of the Andean Presidential Council instructs the Andean Council of Foreign Ministers establishing guidelines for a Food Security Policy Sub Regional.

Agricultural regions

The total area of agricultural Peru amounts to five million 476 976 hectares, a figure of which 27%, ie 477 997 million hectares, corresponding to the Macro North Region.



In 2012 the share of Agriculture sector in the Northern Region Macro Gross Value of Production (GVP) National Agricultural was 33%. Agricultural expansion at the end of 2012 is based on the increased production of: grape, with a growth of 46%, avocado (27%), cocoa (26.9%), paddy (25.8%), yellow corn (15%), alfalfa (11.3%), potato (7%), wheat (6.7%), dry pea grain (6.3%), barley grain (6%), lemon (5.7%), sugarcane (3.6%) and banana (0.4%).

Climate and Natural Regions (9)

Costa

Has the best conditions for the development of cultivars for export. It has 53 valleys which together constitute about 260 thousand hectares. It has a minimum fluctuation in temperature between night and day. On average springtime temperatures located 19.2%.

Water is abundant between December and April. The rest of the year ground water and reservoirs. Products: cotton, coffee, sugar, mangoes, asparagus, lemon, grapes, strawberries,

avocados, paprika, tangerines, oranges, olives, beans etc.

Sierra

Represents 30.5% of its land area and its height varies from 800 to 4800 m. In the mountains about 70% of the cultivated area is under rainfed regime and the rest irrigated. The Andes have diverse ecosystems with a variety of climates and temperatures with inter-, low- and intermediate valleys.

Presents temperate climates with higher temperatures averaging 20 degrees C; boreal and cold weather with an annual average of 12 degrees C, frigid tundra climate or whose average temperature is

6 degrees C, comprises the hills and plateaus between 4000 and 5000 masl and cold climate with average temperatures of 0 degrees C.

Commodities: cereals, beans, vegetables, tubers, natural dyes, and other overhead.

Selva

It covers 59% of the territory. It has an area of 76 million hectares. It is covered by tropical forests 25 degrees C. Temperatures heights ranging from 100 m 500 m.s.n.m.

Products: coffee, cocoa, oil palm, camu camu, fruits, wood species such as cedar, mahogany, walnut, cumala, ishpingo, capirona congona and other species

Farm Insurance (10)

Law No. 29148, dated 12.12.2007, provides for the Implementation and Operation of the Guarantee Fund for Agricultural Field and Security (Guarantee Fund); among others defines the composition of the Board of Directors (01) MINAG representative (Vice Minister presides) 01 MEF representative and representative of the PCM 01 and appoints its Technical Secretariat .DS No. 019-2008-AG, Operating Regulations trust for Agricultural Insurance

10- www.riesgoycambioclimatico.org

The social fund is intended to finance agricultural insurance mechanisms offered through the Insurance System, regulated by Law No. 26702- General Law of the Financial System and Insurance System and Organic Law of the Superintendency of Banking and Insurance to reduce the exposure of farmers to climate risks and the presence of pests affecting their production and profitability.

Guarantee loans granted by financial institutions to small and medium agricultural producers direct their activity towards domestic and / or international and demonstrate profitable projects. Climate change affecting particularly struck Peru's agriculture this year causing drought in some regions and floods in others, as a result of climate disruption pests and diseases increased Peruvian cultures. Nearly forty percent of the population in Peru is dedicated to agriculture and farmers face challenges to water resources because in some areas there are droughts and other excessive rains, which graphically climate change. In the Andean region of Peru, are occurring droughts for seven or eight years ago, however the North coast is an area greatly affected by the event of El Niño and who have registered higher rainfall than normal, although the general trend is a decrease in rainfall, more intense they could be presented in a short period and cause flooding, which is observed quite frequently in the Peruvian jungle region. Every year is issued state of emergency in those regions. As impacts Peruvian Agriculture, drought or excessive rainfall reaching directly affect crop development are. However, the indirect impact has been more significant and harmful because it favored the development of pests in drought conditions and diseases in rainy conditions. Overall agriculture has a high vulnerability to climatic variations losing more than 15 thousand hectares for each crop year associated climate effects is observed that every two years the sector faces losses surface peaks.

For the management of climate risks, the Ministry of Agriculture, through the Guarantee Fund for the Countryside and Agricultural Insurance, Agricultural Insurance deployed Catastrophic. This insurance is a private public initiative, funded 100% by the Peruvian government, which seeks to protect the poorest farmers in the country through an insurance scheme that allows to address damage caused by catastrophic events, primarily in the strata of resource-poor farmers. The Catastrophic Insurance is not a traditional insurance does not cover production costs. It is

rather a palliative used to support the poorest agricultural producers located in rural areas, and largely practice subsistence agriculture. The amount you are given is so they can keep families to recover their lands productive capacity

Furthermore, the possibilities of agricultural insurance coverage is:

Insurance indemnity against multiple risks, which is addressed solely to the agricultural activity and usually guarantees a percentage of the historical agricultural yield of the farm taking coverage.

Insurance parametric yield, which is addressed to different actors along the agricultural supply chain and its compensation payments based on historical performance of crop yield in the region where agribusiness operates.

Parametric insurance climate, which is meant for the different actors along the agricultural supply chain and its compensation payments based on climatic variables affecting agricultural performance, such as rainfall, temperature and solar radiation.

CULTIVATED AREAS OF PERU





CHAPTER VI

REPUBLIC OF URUGUAY

Geographic Location

Uruguay is located in South America, with coasts on the Atlantic Ocean, between latitudes 30° and 35° south latitude and meridians 53° and 58° west longitude. It is located in the temperate zone of the southern hemisphere.

Bounded on the north and northeast Brazil; west with Argentina through Uruguay River; south to the Rio de la Plata and east by the Atlantic Ocean



Agriculture contributes about 10% to the country's GDP and is the main source of foreign exchange, the country has a humid subtropical climate with mild rainfall distributed throughout the year, a nearly continuous ground cover of fertile natural pastures, the existence of

numerous streams distributed throughout the country, as well as countless reservoirs that collect surplus from heavy rains, all of which makes possible the production of rice. The production, very homogeneous, is performed by large, medium and small agricultural enterprises. Industrialization and marketing generally focuses on large mills, although it should be noted the existence of small and medium milling companies. In field crops, is investing more capital per hectare, not only in the operating cost of cultivation (seed, fertilizer, herbicide, fuel, labor, parts, etc.), but also requires high investments in: machinery and equipment, installation of pumping stations, canals, drains, roads, bridges, dams for irrigation and so on. Currently, a producer with 150 acres of rice has a capital expenditure close to U \$ 200,000

Agro-Ecological Zones

Northwest Coast

It is an area of medium light soils suitable for agriculture. The average annual temperature is 19 ° C, with a high of 38 ° C and no risk of frost from June to September. the annual rainfall is 200 mm. Includes the departments of Artigas, Paysandu and Salto. Spring begins one month earlier than in the south so the scoops it suitable for vegetable crops in greenhouse and field west Coast

The soils are vertisols Brunosoles and high agricultural potential. temperature average annual temperature is 18 ° C, the maximum is 35 ° C and there is a risk of frost from June to

September. The average rainfall is between 1 000-1 100 mm per year. includes departments of Colonia, Durazno, Flores, Soriano and Black River. It is the main area agriculture in the country thanks to the ability of the soil

South

Soils are Brunosoles, Vertisols and Argisoles. The average annual temperature is 16.5 ° C, the maximum is 33 ° C and there is a risk of frost from June to August. precipitation annual average of 1000 mm. Includes the departments of Canelones, Florida,

Maldonado, Montevideo and San José. Predominantly vegetable crops, fruit growing Deciduous and viticulture.

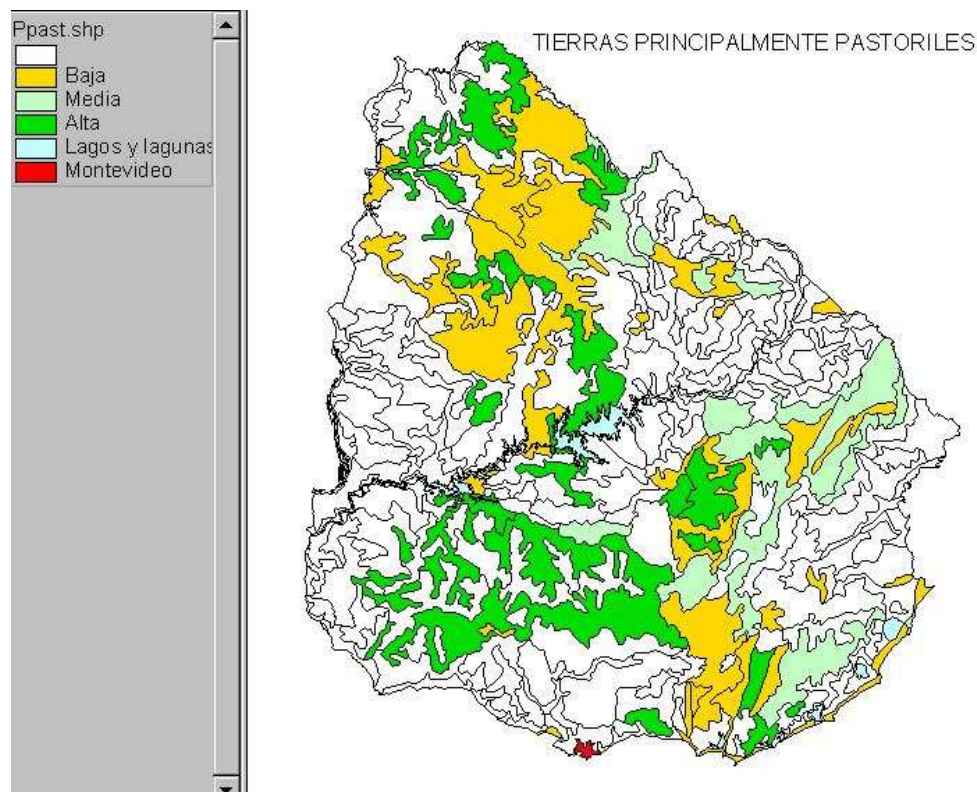
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Soils are planosols and humic gley. The average annual temperature is 17 ° C, the maximum is 32 ° C and there is a risk of frost from June to August. precipitation average is between 1 100-1 200 mm per year. Includes the departments of Cerro Largo, Lavalleja, Rocha and Thirty-Three. It is a particularly suitable area for rice flooded.

North

Soils are mainly light, loam, sandy. The average temperature year is 19 ° C, with a high of 38 ° C and there is a risk of frost from June to August. the annual rainfall is between 1 200-1 300 mm. Includes departments Rivera and Tacuarembó and is a predominantly livestock area.

MAINLY LAND PASTORAL



Farm Insurance (11)

In 1993 Law No. 16,426 of state monopoly insurer Banco de Seguros del Estado (BSE), state insurer created by law in 1912, which had acted as such for 82 years, repealing therefore provides free competition the insurance market and the Superintendency of Insurance and Reinsurance at the Central Bank is created. However, the agricultural insurance market in competition of newly made in 2001 with the entry of MAPFRE, then SURCO in 2003 and finally in 2006 SANCOR therefore currently offer agricultural insurance 4 14 registered insurers SSF -BCU: 3 private and 1 state. Most insurance expansion occurred in the "commercial" farming of cereals and oilseeds, especially in crops mostly for export. In recent years there has been considerably increasing the% penetration (secured area / harvested area) although there is no policy that promotes safe these crops. The high level of penetration is due in part to the demand of exporters that producers have insurance and secondly, to improve the supply of coverage in terms of number of risks covered and flexibility of conditions in contracts given increasing competition between companies. Most nominees are hedge risks covered risks: hail, wind, fire, lack of floor harvesting, replanting, among others. The return type of insurance has not spread much further contemplates the risk of drought and water excess in some insurance because yield historical information is needed by producer, not always available. RISK SHARING SYSTEM LOSSES HAIL BETWEEN PRODUCERS ("mutual") (rice and barley) In Uruguay "mutual" hail calls to operate on crops that have a strong vertical integration with the industrial phase of the chain such as rice and barley, because that organization facilitates the implementation of the system of "mutual".

Under this format, the producers are committed to share the damage caused by hail, adhering to a contract (without paying premium) establishing the form of injury determination and contribution to compensate the producer who has had an accident. The amount to be contributed by producer is deducted from the settlement contributed to grain rice mill or malting. In some cases membership is voluntary and other is mandatory. The limitation of this system occurs when the level of damage exceeds the contribution agreed by producer (maximum contribution is stable). For this reason, from 2008-09 these organizations chose to hire an insurance supplement insurance (type stop loss reinsurance)

companies how to cover excess losses exceeding the mutual fund.

Country law does not require mutual producers the same formalities as the insurance companies (technical reserves, reinsurance, tax contributions) so they are seen by these companies as competing on unequal terms.

INSURANCE WITH GRANT (for farm sector alone).

In 2002, as a result of a strong tornado that destroyed the vegetable and fruit crops in the south of the country, Law No. 17,503 (amended by Law No. 17,844 of 2004) which creates the Fund for Reconstruction and Development of the Farm is enacted (FRFG) to meet these production losses and infrastructure and promoting the development of establishing insurance premium subsidies at a rate of 35%.

The importance of this statement lies in the fact that for the first time in the country the application of premium subsidies is enabled. The FRFG is funded by the levying of VAT on the sale of fruits, vegetables and flowers (the tax is collected by the Ministry of Economy and then transfers it to MGAP).

The instrument under the Act to grant the subsidy is through agreements (= contract) between the MGAP and the Underwriters who wish to participate by providing insurance for the farmer sector. But for different reasons, but two private insurers expressed interest, since 2002 when the first agreement to the present, only has made agreements with state insurance BSE was signed.

Parametric Insurance (12)

In the Eastern Republic of Uruguay Seguros draft specific indices sponsored by the Inter-American Development Bank (IDB) and the technical assistance of the International Food Policy Research Institute (IFPRI) was presented. The most notable aspects of the initiative are implementing an innovative methodology (Bond Insurance) allow taking into account the risk profile of the producers and the implementation of a pilot project which will be implemented hedges designed

Insurance to be considered in this project and to implement the pilot program are innovative and

12- www.mgap.gub.uy

parametric or index-based insurance-type products. In particular the design of the proposed insurance follows the approach proposed by the International Food Policy Research Institute (IFPRI) based on bond insurance scheme. This scheme includes all the product advantages of index insurance and whose application is especially appropriate for family farmers of small and medium scale while minimizing the costs of verification of claims; and thus become economically viable policies with relatively low insured amounts. Additionally, the scheme proposed by IFPRI allows you to enter simple products, easy understanding by the farmer, and provides flexibility to suit different risk profiles and insurance claims.

BASIC ELEMENT: BOND INSURANCE

IFPRI has recently developed the concept of "climate insurance bonus" ³ as the centerpiece of a parametric insurance scheme or index. The insurance bond is a very simple instrument and in simple terms is a tool that provides a payment or compensation fixed who purchase if certain pre-established condition is presented, in this case if the selected index takes a value in a given interval otherwise the buyer does not receive any compensation. However, the proposed system relies on multiple insurance bond insurance and the insured leaves the choice of which potential or insurance bonds which are of interest depending on their risk profile and the price (or premium) of each bond.

Each bond insurance is completely defined by the following basic elements: index, coverage period, reference weather station, timer, single payment, and premium. Typically, an insurance bond carries the following information: "The buyer of the insurance bond will receive a lump sum payment if the value of the index that will be experienced during the coverage period and calculated on the basis of information in reference weather station is less (or greater) than the trigger value, otherwise there is no payment. The bond price is the premium. We briefly explain each of these concepts index

This is central to the insurance parametric or index. The index is the variable with which it seeks to capture the source of risk to be insured. For example if you want to ensure is the risk of low crop yields due to precipitation (rain) inadequate indices could be used to:
Total mm of rainfall in mm (millimeters)

Average daily rainfall in mm

Maximum daily rainfall in mm, etc. inter alia

The index finally selected must meet three basic characteristics:

- 1) must be publicly observable and verifiable.
- 2) Must be independent.
- 3) You must maximize your association or correlation with the source of risk.

The trigger (trigger)

It is the index value "triggers" payment or compensation to the holder of the bond insurance (insured), also called "threshold". Payments are defined either above or below the trigger: The bond insurance provides a payment to the insured if the entered value is greater than the rate for the shutter, otherwise no payment is made. The chance to grant payment is equal to the probability that the rate is higher or lower (depending on how you set the bond) to the trigger. This probability can be approximated with historical weather information

The coverage period

The bond insurance should be defined for a specific period of coverage. So when it is said that the bond issue an insurance payment if the index registered a higher or lower value to the trigger must specify over what period. If the index is for example the accumulated mm of rain must be explained the day begins and ends to accumulate mm of rain. If the index is for example the maximum daily rainfall mm should be said for the period covered, from the tenth day to day .

In the case of farming risks change according to the stage in which the culture is located. Thus while in the seed stage may be the greatest risk excessive rain accumulated in the step of harvesting may be excessive rainfall in short periods of time. Therefore it is advisable to offer insurance bonds for different periods of coverage and possibly with different indices. It will be the producer who decides that want to ensure period or periods.

Reference Weather Station

Insurance bonds provide a fixed payment to the insured only if the index takes a value defined above or below the trigger, according to the definition, and during the coverage period. However to calculate the specific value taken by the index must say what information to use to make this calculation. Normally the information comes from a weather station where an

independent insurer and the insured entity makes measurements of climatic variables. You must specify what is and the location of this weather station reference. Those producers who are far from this weather station not interested in insurance bonds whose payments rest on their agricultural lands distant climatic measurements were found. Typically considered "far" to greater than 20 Kms⁴ distance, this distance however is something that should be studied for the case of the area in which to work.

CULTIVATED AREAS OF URUGUAY





GLOSSARY

ARGISOLES are Argisoles Leachate Saturated Soils that meet one of the following: lack of an albic horizon. They have an albic horizon (a subsurface horizon is light colored which have been removed from the clay and free iron oxides, or in which the oxides have been segregated to the extent that the color of the horizon is determined by the color of the particles Sandy and coatings that these particles. discontinuous silt. Present continuous albic horizon less than 3 cm thick

ASTER Advanced Spaceborne Thermal Emission and Reflection Radiometer

AVHRR Advance very high Resolution Radiometer

BENCHMARK In computing refers to techniques used to measure the performance of a system or component thereof.

IDB Inter-American Development Bank

BRUNOLES are dark soils with high organic matter content and generally medium textured, at least in the surface horizons

BSE Bank State Insurance

CONAE National Commission on Space Activities

COMSA Agricultural insurance Committee (Chile)

COORDINATES Coordinates are a reference system that uses both angular coordinates, latitude (North and South) and longitude (East and West) and used to determine the side of the Earth's surface (or in general of a circle or a spheroid

CORFO Development Corporation Production

CPR Insurance Certificate Product

DRYLAND Arable land that has irrigation, receives only rainwater

EGM Georeferenced Sampling Station

ELLIPSOID An ellipsoid is a closed curved surface whose three principal orthogonal sections are elliptical, ie are caused by planes containing two Cartesian axes.

ENSO El Niño Southern Oscillation

RUNOFF hydrology geological term that refers to the sheet of water flowing over the surface in a drainage basin, that is the height in millimeters of rain water drained and extended

FOGASA Guarantee Fund for Agricultural Insurance field and

FONEDA National Fund for Disaster Mitigation Emergency Agricultural

FRFG Fund for Reconstruction and Development of the Farm

GENOTYPE Genotype refers to the genetic information possessed by a particular organism, in DNA form

GLEY HUMIC The gley is a ground to which the presence of ferrous iron confers a characteristic greenish-gray color. Your horizon is humic (rich in humus), very porous. The iron precipitates as sediment below in the layer where the level of fluctuating groundwater

GPS Global Positioning System

IFPRI International Food Policy Research Institute

IGN National Geographic Institute

INTA National Institute of Agricultural Technology

LANDSAT series of satellites built and launched into orbit by EE. UU. for high-resolution observation of the Earth's surface

LATITUDE The latitude is the angular distance from the equator (the Ecuador), and a given poi

LENGTH Length is the physical quantity which determines the distance, that is, the amount of space between two points on Earth, measured along the meridian on which the point is located

MAGYP Ministry of Agriculture, Livestock and Fisheries

MINCETUR Ministry of Foreign Trade and Tourism

MGAP Ministry of Livestock, Agriculture and Fisheries of Uruguay

NOA Nacional Oceanic Atmospheric Administration

ORA Office of Agricultural Risk

PHENOLOGY science that studies the relationship between climatic factors and cycles of living things

PLANOSOLS Planosol The term derives from the Latin word "planus" means flat, hinting at their presence in shallow, seasonally flooded areas. They are characterized by a gradient abruptly overlying eluvial horizon over a dense subsoil.

POES Polar orbiting Operacional Environmental Satellites

PSR Grant Program for Rural Insurance Premium

PROAGRO Guarantee Program for Agriculture and Livestock

RUNOFF hydrology geological term that refers to the sheet of water flowing over the surface in a drainage basin, that is the height in millimeters of rain water drained and extended

SIIA Integrated Information System

SVS Securities and Insurance Superintendency

UF is a unit of account used in Chile, indexed according to inflation.

UTM Universal Transverse Mercator

TRMM Tropical Rainfall Measuring Mission

VBP Gross Value of Production

VERTISOLS that soil is generally black, where there is a high content of expansive clay known as montmorillonite that forms deep cracks in dry seasons, or years.

CONCLUSION

Nothing is specifically human as the ability to create things and making use of natural elements, external forces and the action itself. Every human adventure, every act has to take its share of risk, sometimes high. From the outset insurance has become associated with the risk, it is a mechanism to reduce risk without limiting the capacity to undertake the economic and business development. In this analysis, we developed a research on the Agricultural Insurance against food demand in the Mercosur region.

A study by the United Nations, entitled "World Population Prospects", estimates that world population will reach 9,600 million in 2050, with a real population explosion, particularly in the most vulnerable regions of the world. This is not a minor, it will require an increase in primary production driven by the growing demand for food. The other major player in this global scenario, is the climate that is proving to rapidly change and adapt requires just as quickly.

In the case of agriculture, mainstay of the economy in the countries of Mercosur, you must resort to more methodologies and techniques to continue working despite the uncertainty that lies ahead.

It is here in this context that the Crop Insurance is revealed as a basic input for the producer, as it is a risk transfer tool, which allows you to protect predictability in economic terms against the various contingencies that may threaten them. Each year the insurance industry intended for livestock farming, large sums of money to provide support for producers to an incident and allow the continuity of their business, benefit the entire value chain, with all that means in terms to ensure the production of food for the inhabitants of each country. Our premise in this paper, was to glimpse what would be the preventive measures that should be implemented by the agricultural producer and the demand for food. We build on the thesis of Olivier de Schutter, a Belgian jurist and special UN rapporteur on the right to food, which in 2011 presented a report which states that it must change direction. The old recipes are not valid today, because so far the policies supporting agriculture were aimed towards industrial agriculture. Today it is necessary to direct them towards agroecology in as many places as possible. This last method is to combine trees and crops as a country founded on partnership and biodiversity system.

In our study, early warning systems are analyzed, geographic standards for the integration of spatial data that allow geographic information is integrated to the processes of agricultural risk analysis and transform it into digital geodatabases, along with geographic coordinate systems allow ensure the integration of spatial data from different sources and their compatibility with data generated by other institutions nationally and internationally.

Moreover, the sensor system and monitoring networks allow obtaining knowledge of the area inventory of natural resources and other areas affected by the elements. The course and intensity of weather phenomena in the region of Mercosur manifest through ENSO - El Niño Southern Oscillation causing alterations in the normal patterns of oceanic and atmospheric variables, associated with an increase or decrease in the surface temperature. The sea-level rise in conjunction with winds perpendicular to the coast can cause surges to flood and erode coastal areas.

This phenomenon is of extreme importance as a risk factor for disaster because it generates changes in climate, El Niño is associated with drought in the western Pacific, rainfall in the equatorial coast of South America (especially Colombia, Ecuador and Peru), storms and hurricanes in the central Pacific. In El Niño conditions, the ONI should be equal to or greater than +0.5 degrees Celsius anomaly, while La Niña conditions, the NIB must be less or equal to -0.5 degrees Celsius.

Regarding droughts, affect almost every country in South America. Are usually generated by long periods (months or years) with precipitation deficit. Cause major economic losses and affect media lives in rural communities, subsistence farming. At the same time the extreme temperatures in the region are due to the climatic diversity of South America, seasonal variations and local effects are partly the cause of extreme temperatures in different areas of the region. Extremely low temperatures (frost, cold waves) in populated areas are those that cause the greatest impacts on people and their livelihoods. Above 2.500mts frosts are frequent and occur above the 4.500 m along most of the year, events causing severe damage to the agricultural sector.

Regarding Earthquake geotectonic location of the Pacific slope of South America in the Ring of Fire Pacific makes this area it is located on one of the areas of greatest release of energy on the planet, where it is reported 80% seismic and volcanic activity of the earth. Chile is the

country within the region, with greater seismic activity, has 3000 volcanoes, of which 500 are active.

The agricultural sector in Latin America is exposed to a variety of risks, as the insurance sector, Argentina is the relevant market Hail insurance in Latin America. because its production is concentrated in grains in a region, the Pampas, particularly exposed to this risk, the development of the product at the time of the marketing and design of complementary or additional coverage is the most advanced in the region. Moreover, the expansion of the agricultural frontier and the development of entrepreneurship and high-value technology in other provinces like Salta or Black River, are stimulating demand coverage to private insurance market in non-traditional areas. As state intervention is concerned, the government of the Province of Mendoza is leading the way to subsidize 100% insurance hail of grape and fruit growers of the province. Moreover, the role of the Mendoza government is not here, but is involved in the prevention of hail through active struggle and participate through the Directorate General Contingency Mendoza, in research on atmospheric physics in the area. Since the government of the Republic, SAGPyA and Agricultural Risk Office (ORA) collaborate on the design of specific programs, such as PRODERNEA program for small farmers in the NEA. "With respect to the Federal Republic of Brazil, is one of the most promising in the region, along with the expected opening of the reinsurance increasing supply of bank credit to the agriculture sector sum subsidy premiums and the expectation that arouses South American economies from producing raw materials of agricultural origin. Moreover, in the Republic of Chile, multi-risk hedges are in steady progress. The development aims to incorporate new industrial crops and fruit, ie that whose only destination is a value-added product through industrialization.

Moreover, in the Republic of Peru, the agricultural sector is highly vulnerable to climatic variations losing over 15 thousand acres in each crop year by associated climate effects is observed that every two years the sector faces losses surface peaks.

For the management of climate risks, the Ministry of Agriculture, through the Guarantee Fund for the Countryside and Agricultural Insurance, Agricultural Insurance deployed Catastrophic. This insurance is a private public initiative, funded 100% by the Peruvian government, which seeks to protect the poorest farmers in the country through an insurance scheme that allows to

address damage caused by catastrophic events, primarily in the strata of resource-poor farmers. At the same time, have been entered into agreements with international organizations for the development of agricultural insurance scheme originally intended to subsistence farmers. In regard to the Oriental Republic of Uruguay, began to develop a market more competitive by the emergence of new players in this field in recent years.

Most insurance expansion occurred in the "commercial" farming of cereals and oilseeds, especially in crops mostly for export. In recent years there has been considerably increasing the % penetration (secured area / harvested area) although there is no policy that promotes safe these crops. The high level of penetration is due in part to the demand of exporters that producers have insurance and secondly, to improve the supply of coverage in terms of number of risks covered and flexibility of conditions in contracts given increasing competition between companies.

Most nominees are hedge risks covered risks: hail, wind, fire, lack of floor harvesting, replanting, among others. The return type of insurance has not spread much further contemplates the risk of drought and water excess in some insurance because yield historical information is needed by producer, not always available.

Moreover, a project specific Indices Insurance sponsored by the Inter-American Development Bank (IDB) and the technical assistance of the International Food Policy Research Institute (IFPRI) was presented. The most notable aspects of the initiative are implementing an innovative methodology (Bond Insurance) allow taking into account the risk profile of the producers and the implementation of a pilot project which will be implemented hedges designed.

These reflections on agricultural insurance in different countries of the Mercosur region, allow us to facilitate a thorough analysis of the alternatives that the agricultural producer and the demand for food. The primary agricultural sector will remain agrifood producer, agrofuels and agrotexiles because the life of man on earth requires. The art at one time, customs and public policies determine the allocation of land to one activity or another, all of them essential. In conclusion, the agricultural sector of the Mercosur region, is often subjected to conditions that threaten variability on expected production of food, which is why in a context influenced

by climate change have tools to assess and manage risk agriculture, it is essential and necessary not only to safeguard food security, but also to ensure economic and social sustainability of agricultural producers in the region.

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