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MERCOSUR GROUP

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CHAPTER II

FEDERAL REPUBLIC OF BRAZIL

Introduction

Once again, we meet the AIDA EUROPE IV Conference in London, to feel united as Mercosur Group, in a single desire, to be a part of changing the world. For Mercosur Group is satisfying to recognize that we are bound together by the same desire to travel on the same ideals based on a genuine interest and research work and reach as far as possible ecumenical.

This time, we welcome the inclusion in the research group of the Republic of Peru, represented by Dr. Miryam Elisabeth Aragon Mirror, country associated to Mercosur. Henceforth, we will continue with the message received since our inception, the study of a subject that is present in each individual conference agenda, Climate Change, with the challenge of knowing that the preparation of agendas are of interest throbbing. We are aware that our essence is synonymous with art and temple, as men of law awaits us constant education and training, to make a mark each sees more significant in every investigation.

In this work, each team member country, has developed a different theme, allowing to give the world a broader knowledge of the region.

Summary

The research is divided into five chapters, each participating countries have developed different topics related to Climate Change, Environment and Insurance Law.

Chapter I

Chapter I deals with the issue concerning weather phenomena that affect the agricultural sector in Argentina.

It was developed in particular phenomenon of drought, classification, methods for quantification. At the same time tried ENSO effects, risk transfer, and finally agricultural insurance as observed in shallow Drought agricultural season in the United States of America.

Chapter II

Chapter II, has been developed by the Federative Republic of Brazil. In the comprehensive report have developed different topics of major interest: environmental education, environmental insurance in the Brazilian market, the Kyoto Protocol and its impact on the insurance industry, and finally the Clean Development Mechanism and the Carbon Market Brazilian industry.

Chapter III

In Chapter III, The Republic of Chile has developed the theme Environmental Impact in the City of Santiago de Chile, one of the most polluted cities in Latin America. The report includes environmental law, civil liability and environmental damage insurance policies for environmental damage.

Chapter IV

Chapter IV, has been developed by the Oriental Republic of Uruguay, in particular, has addressed the issue of Municipal Solid Waste, the legal and institutional framework and especially
Industrial solid waste and hospital.

Chapter V

In Chapter V, the Republic of Peru, has developed a theme of great relevance today: The retreat of glaciers, and Climate Change Threats and this will cause in the future and Mitigation address this phenomenon.

ANNEX I

This annex includes jurisprudence related to the topics covered by the various members of the group.

CHAPTER I

REPUBLIC OF ARGENTINA

Weather events that affect the agricultural sector

Dr. María Kavanagh

ACRONYMS

CONAE	**National Commission on Space Activities**
ENSO	**El Niño Southern Oscillation**
IPCC	**Intergovernmental Panel on Climate Change**
MEI	**Multivariate Enso Index**
MODIS	**Moderate Resolution Imaging Spectroradiometer**
PDSI	**Drought Severity Index Palmer**
POES	**Polar Orbiting Operational Environmental Satellites**
SPI	**Standard Precipitation Index**
SST	**TemperatureSea Surface**
TRMM	**Tropical Rainfall Measuring Mission**

REPUBLIC OF ARGENTINA

Weather events that affect the agricultural sector

Dr. María Kavanagh

Scientific research of the Intergovernmental Panel on Climate Change (IPCC) have shown that due to global warming in different regions of the planet, are being recorded and will be manifested throughout the century several changes in the weather so much faster than in others that have happened throughout the history of the earth.

In Argentina, there are clear signs indicating that there are regional changes in climate and in this context, agriculture is one of the traditional economic sectors most exposed to climate risks.

The effects of ENSO (El Niño-Southern Oscillation) on rainfall in Argentina are more marked in some months and not seen in others.

The occurrence of an event or the Girl Child, in general alter the weather and it is clear that the levels of risk to particular weather events such as drought, excess water or ice will be modified.

In this research we focus on the risk of drought in Argentina, has established a review and evaluation of this weather phenomenon while a report from the impact of this phenomenon in all the Mercosur region.

PHENOMENON OF DROUGHT

Droughts in Argentina is an old scourge, the first records date back almost to the founding of the City of Buenos Aires in 1580, later in the month of February 1617, records a period of drought. In the summer of 1625 - 1626 in the absence of rainfall declaring a major drought and the period between the year 1701 and 1720 is called "The Big Dry."

CLASSIFICATION OF DROUGHT

Drought can be classified according to water variables involved. In this regard Wilhite and Glantz (1985) have defined four categories of drought:

Meteorological drought: Based on climate data is an expression of the deviation of the precipitation of the value averaged over a period of time.

Agricultural Drought: The phenomenon is due to insufficient soil moisture to allow normal development in a particular crop in any stage of growth.

Hydrological Drought: We present to the deficiency in flow rate or volume of surface or ground water (rivers, lakes, streams)

Socio-economic drought: They occur when water availability decreases to the point of financial or personal damage to the population of an area affected by low rainfall.

METHODS FOR MEASURING THE DROUGHT

To quantify drought has developed a number of different indexes. The indices used are:

The index of Palmer Drought Severity (PDSI)

Standard rate of precipitation (SPI)

Index Palmer Drought Severity (PDSI)

The Drought Severity Index Palmer, is the most widely used method internationally quantifier. It was developed to measure the intensity, duration and spatial extent of drought. PDSI values derived from measurements of rainfall, air temperature and soil moisture together with previous values of these measures. The drought index has been used to evaluate the impact of drought on agriculture. The PDSI, is all precipitation like rain, so that this index is not useful at high latitudes, particularly in winter when most precipitation is manifested in the form of snow.

Standard Precipitation Index (SPI)

Standard rate of precipitation, was designed to improve early detection of drought and to monitor it (McKee et al 1993). The SPI is a measure of drought simpler than the severity index of Palmer drought (PDSI), and is based solely on the probabilities of occurrence of precipitation for a given period. A key feature of RLS, is the flexibility of measuring drought on different time scales. Short-term droughts are measured by meteorological instruments and are defined according to specific regional climatology. The droughts of importance to agriculture are in deficit soil moisture and drought three to six months can cause great impact.

The longer droughts for months to years can have significant impacts on water supplies surface and groundwater.

INITIATIVES TO STRENGTHEN RISK MANAGEMENT

Increases in production of agricultural commodities and agricultural frontier expansion, are affected by climate hazards, vulnerability and risks of each production area, which requires having a system of climate risk management.

It is necessary to minimize the occurrence of national emergency, provide the vulnerabilities of each region, taking techniques, production practices and adopt management tools for the impacts of extreme weather events in the production and rural populations.

An indispensable basis for a risk management system is the integration of mapping information and mapping irrigation of vulnerability data and models. These tools allow a diagnosis of information needs, identification of critical areas, the characterization of areas of vulnerability and prioritization of areas or areas that require intervention.

In this context, the Ministry of Agriculture, Livestock and Fisheries integrated geospatial data base, that contribute to the incorporation of models of tracking and monitoring during development of the crop year.

Cartographic standards: spatial and temporal scales The digital mapping through GIS and geographical databases is done through the systematization of information for the entire productive assessment of agriculture, natural resources or risks.

The different scales used indicate soil properties, the assessment of areas not useful and lower yields, changes in soil water balances in the soil, water balance, the rate of erosion, the vegetation index.

Two aspects are important to consider: the time scale appropriate for a risk assessment of agriculture and the temporal frequency of availability of information for monitoring. The different climatic risks affecting the agricultural sector, and the processes resulting from the impact of climate should be evaluated according to their time scale.

SENSORS AND NETWORKING FOR OBSERVATION AND MONITORING

Remote sensors are remote sensing systems to acquire information about properties of objects, surfaces or materials through instruments that are not in contact with the object. These tools measure the electromagnetic energy reflected or emitted by a distant surface, identifying and categorizing patterns of spatial distribution classes.

Moreover, in addition to providing knowledge about the area, satellite remote sensing allows through monitoring environmental phenomena inventory of natural resources and identify areas affected by risks and processes generated by the impact of climate.

The wide territorial coverage with satellite images allow a synoptic view of each risk or process being analyzed, makes it a useful tool for the study of phenomena very dynamic as, floods, desertification, wind erosion, deforestation, large forest fires etc. .

In Argentina, have been widely used data set Landsat program, now you have a high professional capacity for processing such data for agricultural risk applications. Also, NASA MODIS data and SAC-C provided by the CONADE, are widely used in evaluations of areas affected by risks and agricultural emergencies and regional in scope.

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In the framework of International Charter Space and Major Disasters in Argentina participates through CONAE, in order to access a unified system of procurement and delivery of spatial data, dedicated to natural or anthropogenic disasters and emergencies. Each member agency has committed resources to support the provisions of the Charter and thus help mitigate the effects generated by disasters on the lives of people and property.

In the case of satellite-mounted sensors can describe two types: geostationary orbit and the

quasi-polar orbit. In the first case, the satellite moves along with Earth observing always the same portion of the planet, enabling imaging at frequencies between 15 minutes to an hour, allowing adequate monitoring of weather events, display of clouds, observation of the water vapor in the atmosphere, surface temperatures of land and sea, wind vector determination, incident solar radiation, vegetation conditions, among others.

Moreover, the wave quasi-polar, is slightly offset from the meridians capturing information from east to west of different portions of the surface to the same solar time. Here is a brief overview of key satellite programs in this category.

POES (Polar Operational Environmental satellites orbiting)

Designed for the determination of cloud cover and sea surface temperature, also applied to numerous studies in the field of Earth observation, clouds, lakes, ice, snow, coasts.

MODIS (Moderate Resolution Imaging Spectroradiometer)

The Modis sensor is a radiometer that captures information on studies on vegetation, land surface cover, chlorophyll concentration, fire and thermal anomalies, aerosol concentration, air temperature and water vapor profiles.

SAC-C

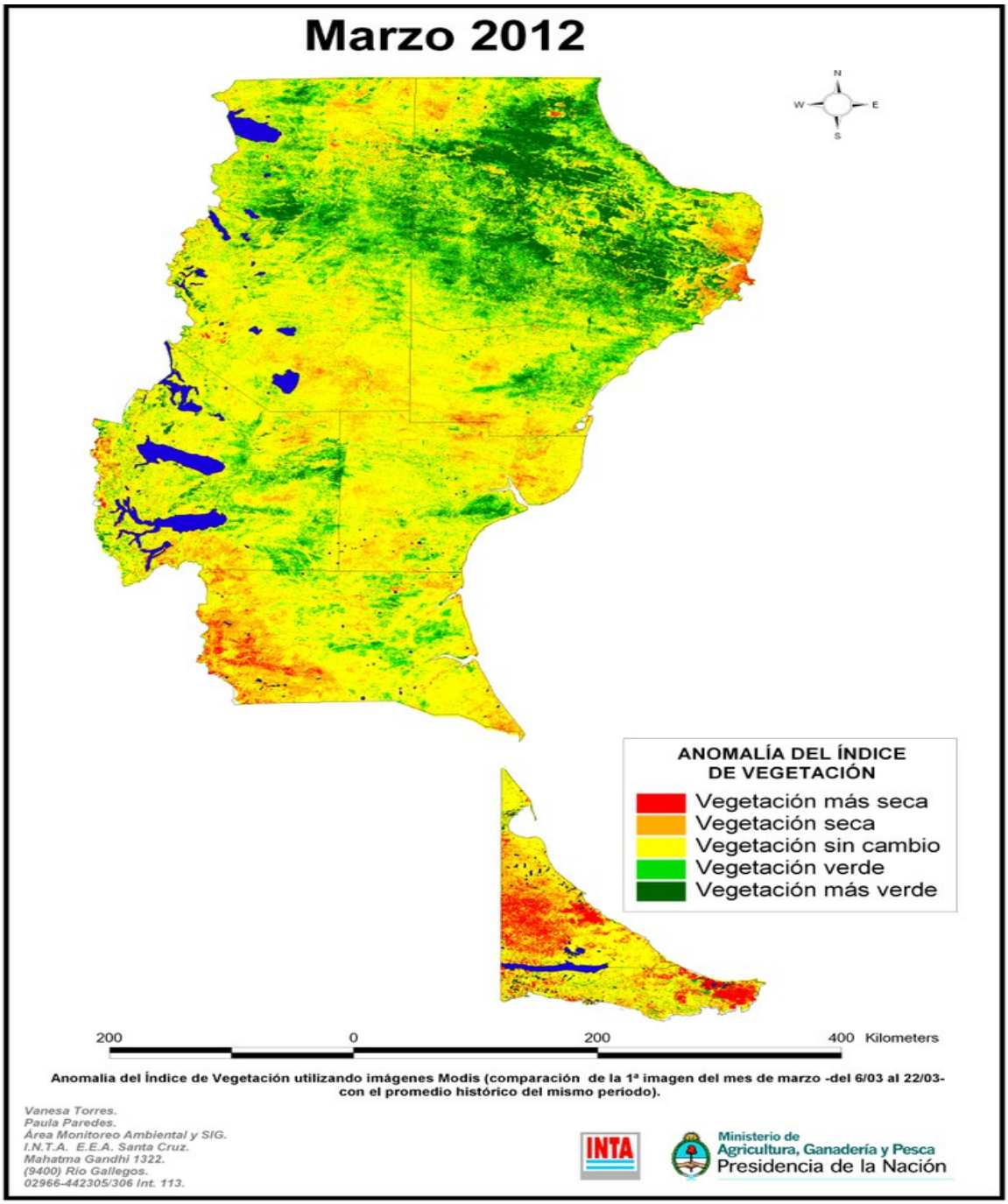
It is an Argentine satellite, designed and operated by CONAE, covers Earth observation and measurements for scientific purposes.

TRMM (Tropical Rainfall Measuring Mission)

Is a sensor designed to generate images of clouds, precipitation and lightning. Captures images between latitudes 35 degrees north and south, is considered fundamental to the study of severe weather conditions.

LANDSAT These satellites are primarily used for the study of natural resources and environmental monitoring.

Monitoring of vegetation through MODIS images in the Province of Santa Cruz. First fortnight in March.



Monitoring of vegetation through MODIS images in the Province of Santa Cruz. First fortnight in March.

Effects of ENSO (El Niño - Southern Oscillation) on the Republic of ArgentinaThe effects of ENSO (El Niño - Southern Oscillation) on rainfall in Argentina are more marked in some months and not seen in others. Are also parts of the country where the ENSO signal

becomes more important, while others have no statistical relationship between rainfall records and phenomena El Niño and La Niña.With the emergence of an El Niño or La Niña, weather conditions are generally altered the levels of risk to particular weather events (drought, excess water or ice) will be modified accordingly. So if you have a forecast of occurrence of anomalous events in the equatorial Pacific (El Niño or La Niña) and are known climate trends associated with each of them, they will be able to provide higher or lower risk levels that in typical years.The major international forecasting institutes have now coupled numerical models simulating the behavior of the sea and atmosphere, that predict the evolution of the system. The results are published weekly and are a tool increasingly used by meteorologists to develop trends in the medium and long term.The ENSO phenomenon is an abnormal warming of surface waters in the equatorial Pacific Ocean, Central and Eastern Europe. The hot spot usually extends from the coast of Peru to 180 degrees longitude above the Pacific Ocean, covering a narrow strip extending from 10 degrees north of Ecuador to 10 degrees south of it.El Niño is characterized by positive anomalies determine the surface temperature (SST), the complementary phenomenon known as "La Niña" or "El Viejo" is an abnormal cooling of the same waters. La Niña is characterized by negative anomalies determine the surface temperature (SST), ie temperatures below the sea surface to the abnormal for the time.The ENSO phenomenon arises from the interaction of oceanic and atmospheric factors and in turn produces alterations installed normal patterns of oceanic and atmospheric variables. While ENOS is associated with an increase or decrease in temperature of the sea surface, other modifications also associated with fenónemno.The Southern Oscillation phenomenon is the component. One way to measure this is through the SOI (Southern Oscillation Index) mean anomaly between Tahiti (French Polynesia) and Darwuin (Northern Australia).As a result of the alterations in the surface of the sea, the circulation of the atmosphere is affected. The normal speed of the wind over the equatorial Pacific can be strengthened, debited or may even change sign, resulting in a reverse circulation to normal.The sea temperature is modified during the El Niño - La Niña, as well as the temperature of the atmosphere. About the area ENSO atmospheric temperature is monitored at an approximate height of 5000 meters. It was developed an index that integrates different indicators, known as MEI (Multivariate Enso Index) calculated in the Climate Diagnostic Center (National Oceanic

and Atmospheric Administration). Ete index is based on a combination of the six main observed variables over the equatorial Pacific.The MEI is selected as the most comprehensive indicator of the state sea - atmosphere during an El Niño or La Niña. This index was taken as determining the state of ENSO and proceeded to search for signs of it on precipitation and yields in the study area based on this index.

.IMPACT ON THE PRECIPITATION ENSO

The analysis above permits us to deduce that the possibility of long-term predictions of the temperature of the sea is becoming more feasible. The necessary condition for these forecasts prove useful, is the proven existence of an impact of ENSO on weather variables in the region of interest. The availability of an objective indicator of the phase relationship between the predicted and likely ENOS

deviation of rainfall relative to normal will be a valuable tool for assessing possible changes in the risk values obtained by taking all phases together (risk maps).
The anticipated outcome of the beginning of a phase of El Niño from a given month will assess the increased risk of excess or decreased risk of drought in areas that show a significant correlation with this event.

After determining the probability values for all available points proceeded to map out points of impact of ENSO on precipitation in season, highlighting areas with higher than usual frequency of occurrence of extreme precipitation events in a context El Niño or La Niña.

After obtaining the relative frequencies in all seasons of the year, we identified those for which the occurrence of rare or abundant rains proved significantly higher or lower than 33.3%. In such cases it may be determined that there is evidence of an impact of phase El Niño or La Niña on rainfall.

The results led to the development of maps showing locations where they could see any impact or not El Niño or La Niña on rainfall for each quarter of the year.

Drought 2008

The rainfall recorded during 2008 were the lowest in the last 47 years, affecting all agricultural area in varying degrees of magnitude. The rains were 40 to 60% below normal rainfall values. In the period of December 2008, January 2009 most of the so-called core area was affected by Pampa rains so scarce that only occurred once every 20 years or more

in the two months more critical for the production corn and sunflower. In the region of Patagonia, from the winter of 2007 the accumulation of rainfall was below normal. The situation worsened as the forage growing season of the year 2007 - 2008 was highlighted by the limited availability of water for vegetation and low temperatures during the months of September and November.

Both phenomena together, coupled with inadequate management of forage resources, greatly affected the Patagonian livestock production, causing high mortality of sheep and beef stock, reduced wool production and the quality of it.

After the drought of 2008, the deficit continued in several areas, including Buenos Aires them. A severe wind erosion affected this area due to the intensification of the deficit over the summer.

Drought 2011 – 2012

The La Nina phenomenon affected the agricultural season 2011 - 2012 with significant economic losses. It is the second consecutive La Niña episode after what happened in the year 2008 to 2209.

Since the beginning of December 2011 to early February 2012, the drought had dramatic effects

For coincide with flowering and grain formation, mainly corn and soybeans. The corn crop was estimated normal at 28 million tonnes, and was reduced to 20 million tons, while soybeans, whose planting record should reach 18 million hectares dropped to 16 million hectares.

The events show How much would subsidize agricultural insurance premiums? - A brief analysis of the sector, a glimpse that if the country dispusiera encourage the use of subsidizing 50% sure it performs as Brazil, the state would have to invest $ 120 million, an amount that is insufficient to meet the level of risk of a event like the one in this crop. Another additional incentive for greater use of insurance would be the official bank, credit available all agreed should be assured of a safe

These incentives would allow 70% of the planted area is secured, increased percentage coverage of small producers.

The main conclusion we arrived on the use of insurance in agriculture, is that those who claimed in the agricultural cycle 2011-2012, recovering amounts of investments in crop establishment and have the resources to grow year next, they have transferred business risk to insurers and reinsurers in the world. Moreover, non ampararon their crops and lost their investments will have to appeal to new resources for planting in the next cropping season.

Hail Phenomenon

Hail storms is one of the main generators of damage to crops in Argentina. In the agricultural insurance sector, 85% correspond to the phenomenon of hail, for this reason it is essential to study hail events, which is a random phenomenon both in space and in time.

Through analysis techniques spatiotemporal maps were generated using interpolated daily series of 93 weather stations: average annual hail events and percentage of events per season.

It is observed by these methods, which in the Province of Buenos Aires there is great variability in the average annual events while in the northeast of the country and north coast, the region has a more homogeneous behavior.

In the southern region of the Province of Mendoza, which receives storm from the mountains, there are as many reports of hail at the surface.

The Northwest region of the country presents mean values of oscillation and is a relatively low annual frequency of events. The decrease of events associated with the presentation of tropical air masses thus to a more homogeneous heat atmosphere. The annual average is

maximum hail events over the province of Cordoba and La Pampa and decreases towards the north of the Coast. These events are recorded hail mostly in the spring season in the Northwest of the country, while on the province of Cordoba, La Pampa and southern Buenos Aires province maximum hail events phenomenon is observed at station Summer, in the months of December and January.

In the autumn season, the occurrence of hail presents minimal logging. The seasonal frequency maps, marked a clear schedule of each of the seasons. Maps were generated from the season of spring, summer, autumn, and winter. Over 60% of hail events Corrientes province, north of Santa Fe and northern Cordoba occur during the spring months. In the rest of the region the percentage frequency ranges between 30 and 50% during the spring months with a maximum record in October in the north area of Buenos Aires and the entire coastline.

To the south of the province of Buenos Aires, La Pampa and the highest frequencies are observed during the summer season with values close to 40% and most often recorded during the months of December and January.

In the months of the winter season, there is a clear pattern West-East where there is a maximum percentage rate in the Northwest of the country and the coast of the province of Buenos Aires and a minimum percentage record in the province of Córdoba . The maximum percentage of records hail events, occurring mainly in the month of August, when the air is still cold in high levels of income and can be observed masses of warm, moist air from the north by the beginning of change of atmospheric circulation Spring Station. The autumn season has the lowest rate with only 5 to 20% of the events occurrence and spread over three months - March, April and May - with the exception of the south of the province of Buenos Aires and La Pampa where the month March is the period in which the highest number of hail events.

Strategies of agricultural risk management

Restrictions and climatic adversities facing the agricultural sector during the production process, generating a high degree of uncertainty about the outcome of the activity, which brings a high level of risk associated with farms.

The great diversity of climates and soils that presents Argentina, there is no place where the farmer does not face risk of loss due to climatic factors, either by drought, frost, hail, excessive water, high winds or flooding among other adversities.

The producer should have adequate coverage to address the risks that may cause damage of relevance, which seriously affect the company's finances.Lack of risk management involves a high economic loss.

That is why it is important for producers to expand their knowledge of risk management and the subsequent adoption of mitigation and hedging strategies to protect agricultural production of weather events.

Risk Transfer: The Agricultural Insurance

Agricultural insurance is a financial instrument that can stabilize the company's revenues, avoiding unintended consequences.

Damage insuranc

Hedges are intended to compensate the insured upon the occurrence of one or more specific events (nominated risks) that may cause damage to the property insured.

The damage is measured in terms of percentage of total loss of the property insured, then that percentage is applied to the sum insured, in order to obtain as a result the amount of compensation.

The coverage used in this type of insurance is to hail, to which has been added other risks such as damage by high winds, frost and fire.

Sure yields

This type of insurance builds on historical productivity of the insured or the specific growing area and secured a part in percent, of the average expected performance. The producer assumes part of the risk the remainder by the insurer.

This method can be implemented for all risk or specific risk (nominees).

At the same time, new trends in international agricultural insurance implemented index-based hedges.

In recent years there have been new forms of coverages designed to agriculture. Through these hedging instruments, the compensation process is triggered when a particular index reaches certain predetermined levels objectively. The coverage provided to producers is based on the assumption that the index is significantly correlated with the loss of production.

The two main categories of index insurance are:

Performance Indices area

This method can be considered an intermediate step between traditional insurance and thematic index insurance. The performance indexes by area based on an output indicator average within a predetermined area (department, county) If the yield is below the preset limit, producers are compensated insured.

The region covered by performance contracting area should be of a size that includes producers and risks faced similar conditions (homogeneous risk areas) The allowances are based on the average yield obtained by all insured producers.

Climate Indices

Under this system, the insured event is measured as a climate index has a strong correlation with crop losses and provides coverage from the objective measurement of a meteorological phenomenon.

The index must satisfy a number of additional properties to ensure that the index is credible, reliable and handling empty.

The most common indices are measurements of precipitation or temperatures through during different seasons, tropical weather events such as hurricanes, various measures of air temperature below or above a certain threshold. In this type of contract verification is not performed at the individual losses and compensation check is performed when the event occurrence climate at the meteorological station in the policy, insured for all units in the area of influence of the same.

The efficiency of parametric insurance depends on the existence of a positive correlation between the yield losses and weather index. For this reason, in homogeneous areas there is less risk and insurance base rate will be a more effective tool for risk transfer.

Drought Phenomenon in U.S.

The phenomenon known as La Nina is responsible for the widespread drought in the United States, affecting more than one thousand counties in the 32 states that make up the country.

Affected states were declared natural disaster areas, farmers in these areas have access to loans more accessible to better cope with the phenomenon and has caused fires. The lack of precipitation reaching 80% of the surface. As a result of this phenomenon, increased prices of some foods, higher than 50% of soybeans and corn. Producers have insurance that provide some protection against the effects of the worst drought in the country, but at this grave situation, the House of Representatives last week debated a bill to help farmers affected. The U.S. president stressed that Parliament needs to approve a budget for agriculture not only help farmers and ranchers to respond to this type of disaster, but also to make necessary reforms to give them some assurance throughout the year.

Conclusion

The restrictions and hardships faced by the agricultural sector in Argentina, climate change during the production process generates a high level of uncertainty about the outcome of the activity.

Producers need to increase their knowledge of risk management and consequently adopt mitigation strategies along with insurance coverage to protect agricultural production. The risks can not be eliminated entirely, but can be reduced. Cartographic standards, spatial and temporal scales to anticipate climatic phenomena. These tools are used today to Argentina

to determine in advance climate risk in agriculture, indispensable and necessary to safeguard not only food security but also to ensure the economic and social sustainability of agricultural producers.

Quantify the impact and frequency of adverse weather conditions for the agricultural sector to design prevention strategies and risk transfer agricultural and forestry in coordination with public and private agencies involved in the issue.

insurance market reveals that 28 insurance companies cover agricultural insurance. Nevertheless, the area insured reaches 50% of the planted area, in part with insurance Mays hail, hail and additional multi-hazard. Consequently, it appears that some agricultural productive activities of great importance to regional economies with a low level of insurance coverage.

The drought event recorded in the crop year 2011 - 2012, forced a deeper analysis on the part of government institutions and therefore, a state policy on agricultural insurance moves towards the implementation of a mandatory crop insurance

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CHAPTER II

FEDERAL REPUBLIC OF BRAZIL

Environmental insurance. LEGAL APPROACH AND CLIMATE CHANGE

Dr. Pery Saraiva Neto

ACRONYMS

LCA	**Life Cycle**
CETESB	**Company of Environmental Sanitation Technology**
COP	**Conference of the Parties**
DFE	**Design Environment**
ERU	**Reduction reissues**
FEAM	**Environment Environmental Foundation**
ISER	**Institute of Religious Studies**
CDM	**Clean Development Mechanism**
WMO	**World Meteorological Organization**
UN	**United Nations Organization**
PDCA	**Plan. Do. Verify. act**
PNUMA	**Programme UNEP United Nations Environment**
CERs	**Certified Emission Reductions**
SISNAMA	**National Environmental System**
UNESCO	**United Nations Educational,The Scientific and Cultural**

FEDERAL REPUBLIC OF BRAZIL

ENVIRONMENTAL INSURANCE: LEGALLY APPROACH OF MANAGEMENT AND CLIMATE CHANGE

Dr.Pery Saraiva Neto

1 ISSUES PRELIMINARY ENVIRONMENTAL AWARENESS AND EDUCATION FOR INSURANCE

1.1 The environmental problems

The environmental issue is not necessarily a new issue in Brazil. However, taking into account not only the debate but also the actions related to environmental security, are already well advanced in other European countries and the developed world, it's time to position ourselves in Brazil until the behavior of the environment is something present in our daily lives.

Man has interfered in the environment for thousands of years. But recently, the effects of such interference have finally shown that the planet has its limits. And his "patience" seems over. A well known example: increased emissions of carbon dioxide have an influence on the atmosphere and has been implicated in increasing the frequency and intensity of natural weather. These emissions pollute the air and therefore are within the field of environmental studies.

Another effect of environmental degradation is the increasing number of diseases caused or intensified by human activity and has garnered a lot of lives.

Therefore, better known as a subject and its implications on health and the economy, the better the conditions for an improvement in environmental quality. The first step is to realize that we have to follow the development of constructive action that makes people interested in environmental problems increased, awareness and changing attitudes. The environmental crisis seems to be more noticeable in 1950 and 1960 with air pollution in London and New York between 1952 and 1960, cases of fatal poisoning in Minamata

and Niigata, Japan, between 1953 and 1965, Tues pollution by the sinking of the tanker exploded Canyon in 1966.

Appropriate to say that the embryo culture was born and strengthened environmental events such as these. From there, the environmental issue has taken a lighter and began to be discussed in academic circles

In Brazil, an example of advancing awareness of the importance of the environment is established when, in 2002, a survey by the Ministry of Environment, in collaboration with the Institute for Religious Studies (ISER), said that deforestation and the water and air pollution is seen as a major environmental problem. The Brazilians surveyed, 46% said that concern for the environment is legitimate, 81% are encouraged to buy more when they discovered information showing that the products are manufactured in an environmentally correct, 38% were willing to give up gains in the production and supply treatment is best understood if the environment.

1.2 Education Environment: Benefit to life

In 1975, the Belgrade Charter showed that the planet had a major new problem - the environment, and has highlighted the need for a new global environmental ethic. The UNESCO Intergovernmental Conference on Environmental Education, held in Tbilisi, Republic of Georgia 14 to 26 October 1977, argued that environmental education was very important to raise awareness of environmental issues and their implications for the modern world, showing a clear gesture of trying to change.

As the Final Report of the Conference Tibilisi/1977 cited by Teixeira (2004), "Environmental education is an integral part of the educational process. Should revolve around specific problems and have an interdisciplinary character. Their tendency is to strengthen the sense of values, contribute to the general welfare and concern for the survival of humanity. should also do the essential force of student initiative and commitment to action and resort to immediate and future concerns. " Therefore, environmental education can be understood as a process of recognizing values, explain concepts to understand and appreciate the interrelationships between people, their

culture and their environment. Used to establish a code of conduct with regard to the quality of the environment.

Environmental education is inserted into a system in which for the first time there is a perception that something is wrong in the relationship between man and environment. The second step is a slow change in behavior that, in the face of reality, environmental education becomes compulsory

This education also occurs through the press, feeding behavior towards a healthy environment and generate a virtuous circle that moves to become a social fact, when then the coercive attitude of society have changed behavior Normal healthy. Environmental awareness is finally created and will be part of our daily lives.

Crop insurance is a step forward in a society. At first glance it seems not to be environmentally safe inserted in the above process.

However, only "seems" because the consumer is connected to a certain degree of environmental degradation. And the economic society, where their companies do not have to do with environmental insurance, assumes no financial loss for them, receiving damages on behalf of others. Therefore, environmental insurance is part of this process of development of environmental awareness and inserted into ethics.

Do not just wait for the imposition of a behavior and naturally occurring. It is necessary for society to point to that road, which deals with the reality that surrounds us and is clearly the idea that, who can not guarantee to decrease the effects of environmental damage is not about harm reduction, but in passing a bill to third parties.

1.3 The consumption and pollution

Human consumption causes the most damage to the environment. And even a simple television may contain a serious threat to the quality of life on the planet. Research published in Geophysical Research Letters, showed that gas NF3 (nitrogen trifluoride) present in the flat screen TV produces a deleterious effect on the atmosphere 10,000 times greater than CO2.

Consumption is directly and positively correlated with environmental damage. Production of environmentally harmful waste and accompanies the increase in consumption. And emissions of greenhouse gases is the result of increased production of goods and services. Thus, the greater the number of consumers, the greater is the production of goods and contaminating residues that are deposited in rivers, soil or air.

We can define the "pollution" as the contamination of soil, air, aquatic environment or any changes that damage.

But it is important to clarify that, in evolutionary terms, two types of pollution: pollution sudden (accidental) and gradual pollution. sudden and accidental contamination, characterized by urban pollution or pollution caused by a sudden and unexpected event; gradual contamination, characterized by a situation detrimental produced during the process for a time period longer than the sudden contamination.

Examples of pollution is the oil spill in the Caribbean sudden accident caused by a BP platform in 2010.

An example of gradual pollution is the accumulation, for decades, the CO2 in the atmosphere is known as a generator of changes in climate. Another example is an industry that releases gases into the atmosphere without treatment and gradually the floor nearby regions will be contaminated by waste However, between these two types of contamination are a number of possible causes and types of damage, so that it may be difficult to clearly distinguish the classification belong.

The duration, sudden contamination may have prolonged effects for decades. Oil tankers explode or sink when thrown into the sea or the beaches, hundreds of thousands of tons of oil pollution that causes the coast for many years. On November 13, 2002, a storm caused the collapse and the subsequent appearance of thousands of tonnes of oil "Prestige", creating the worst environmental disaster so far reached the Galician coast. Its effects are felt even today in the region, attributed the disaster to 50% in the number of cormorants on the Galician coast in the following years.

As for gradual pollution, we also take into account the current scientific and technological ignorance about the harmful effects of certain substances. There are cases where potential damage is known only after a long period in a "dormant" sometimes resulting in cases in which, originally, was not yet known to science.

1.4 Interaction between pollution and natural phenomena

Both sudden and gradual pollution can interact with natural events. The first, to be accidental, perhaps less likely to interact with a natural phenomenon. But that combination, when it occurs, can maximize the damage to the environment at unpredictable. An example is the oil leak on an oil platform, along with the passage of a hurricane - it can not only improve the condition for transportation of waste for thousands of kilometers from the source. A tropical cyclone may be the cause or the maximization of an existing pollution problem. Fortunately, such a combination is very small. But unfortunately, it is possible. And so it is possible that the number of accidents involving non-climatic factors is small. In response, in 1980 the new rules imposed in the exploration, transportation and storage of crude oil and oil actually decreased the number of accidents. An example is the requirement that the oil began to be built with reinforced hull. Unfortunately, the combination of natural phenomena and gradual pollution is not so small. A good example is what can happen when the occurrence of a flood. The flow of water to sweep the floor and carry waste and residues from region to region. Therefore, a contamination that before the flood was confined to one area and under control, can be explored from its original location and taken to other regions of diffusion of hazardous waste and make the catastrophic problem.

Increased climate variability and intensity of extreme weather events may jeopardize the containers or tanks were prepared to resist with great certainty the impacts of these phenomena. The calculations are based on the historical past and, unfortunately, the future looks very different this gift. Therefore, the future condition that requires monitoring and updating will be a constant in our daily lives.

In Brazil, a tropical cyclone has already happened - the Catalina, and the country of the occurrences of tornadoes.

Despite a short existence, lasting only a few minutes, it has become a destructive force that tropical cyclones more intense, depending on the intensity can destroy almost everything that is above ground.

Importantly tornadoes in Brazil have a much lower frequency than that of the United States. However, the danger for chemical tanks exist and can not be ignored.
In Brazil, new opportunities Catalina are remote, but it has happened in the past can happen again. Despite this finding, it is not a trivial phenomenon, as in the North American coast. However, the presence of large oil platforms on the continental shelf of Brazil leads to tighter security measures at present.

Unfortunately, the floods caused by storms or other causes, such as rupture of the dam, may have something equally or more devastating than those caused by a tornado the highest category. Floods occur regularly in Brazil and in most of the country.
There is an illusion that restriction works # solve the flooding problem. It is a mistake to think so. What a work of such magnitude, in the best case, is to reduce the frequency of flooding or "push" to another location.

When a flood containment work is carried out and the frequency decreases, what actually happens is that usually only those higher intensity flooding is to overcome the limits of the barrier.

To explain more clearly, less intense floods - the most mundane, can be controlled, but more intense - and that happens with a time interval (once every fifty, a hundred or two hundred years.) Because they are less frequent and more intense floods and eventually "erase" the memory of previous floods, there are opinions that are widely spaced, "causing" a relaxation and resulting in more devastating to life and the economy. The action on the properties achieves a high degree of destruction so it will take years until the situation returns to normal. Soil is removed from place to place depending on the level of resistance, even for the immobilization of the work will be destroyed.

The contamination in the soil will be taken and deposited elsewhere, that the dissemination and maximization problem. Therefore, it will be similar to what happens at sea when the interaction between an oil spill (or platforms of ships) and the passage of a tropical cyclone, resulting in an increase in the contaminated area.

1.5 The environmental degradation is a serious threat to life

The World Health Organization has conducted worldwide to determine the relationship between environmental degradation and human health. A recently published study shows that there is no cause for concern and we are in a state of alert.
Air pollution is a major cause of death in the world and Brazil is one of the countries with the highest number of cases. Countries with greater economic development and increased population, such as China, India, Indonesia, United States, Nigeria., Are the top of the list. The growing fleet of vehicles is undoubtedly one of the main causes of degradation of air and therefore the increase in deaths.

Degradation in water quality, sanitation and hygiene, in turn, is another factor responsible for a large number of deaths annually.

The two most affected countries are India and Nigeria. The second most affected in terms of intensity, is composed of the countries of Africa and Ethiopia, Zaire. In the third group are some Asian countries (China, Indonesia, Pakistan and Afghanistan) and Africa (Niger, Angola and Kenya).

Brazil is the fourth group accompanied by several African countries. In the fourth group, the least affected, are most of the countries of the Americas and the countries of Europe and Oceania.

As for deaths and diseases in which the environment exerts a major influence, we see that, in percentage terms, with the exception of Papua New Guinea, Oceania, countries with the highest rates are found in Africa and Asia. Brazil is the third group. In the fourth group are the Anglo-Saxon America, Western Europe and South Africa.
What we see is that the two most populous countries, China and India are the first group,

which means that more than one third of humanity is at greater risk because of a disease attributable to the environment.

The most common diseases of environmental pollution, in proportional terms, are respiratory infections and diarrhea. However, the list of diseases in which the environmental factor is present is enormous and noise pollution.

The traffic of large cities has become a major cause of death. Noise and air pollution are responsible for silent deaths. Gradually, the individual's health is eroding in an evolution that ultimately ends in death.

For example, the noise does not cause "only" hearing loss, but may also be responsible for 3% of coronary heart disease. A noise level of 35 decibels is enough to cause disruption and increase risks.

The noise causes fatigue, irritability and increased aggression and creates chronic stress that has led to changes in blood vessels and heart, contributing to heart attacks, strokes and heart attacks. Studies conducted by the Working Group on Diseases of excess noise, World Health Organization (WHO) show that each year thousands of people lose their lives due to the effects of chronic exposure to noise. Thousands have diminished the quality of life in an exposure.

1.6 Sustainable Development

The world as we know it today can not be the same in the future. In a few decades, geography and the environment will not be the same if humanity does not change the behavior of consumers more convincing.

We are not gods in the world, but our effects on the environment have shown that, in fact, have been agents of change for the worse.

As we have seen, human life is affected by the pattern of consumption and environmental education imposes standards of behavior and the environment in this sense we still have much to change.

Environmental insurance is part of this change in behavior. Unfortunately, Brazil still belongs to the list of countries where there is a culture of valuing the environment dominated by the responsibility of losses. A person, for example, you feel sure you can lose equity. But polluters tend to shift the burden to society of pollution, and keep the winnings. Since there is no loss of property, as the cost of pollution is transferred to the community, these organizations remain lodged in a position ambiental.Por degradation therefore state action and change society in a new culture , social responsibility have an important role in this process of maturation.

This change must be slow, despite continuing. And until that concern for the environment becomes a social fact, every action, individually or in groups, serve to show that change is happening, is progressive and lasting.

Hering (2004) defines the environmental problem, so when he says that "the damage to nature is not only a heinous crime, killing plants and animals and pollute and destroy. Endangering the quality of life, acquires the connotation of a crime against humanity ".

2 SIZING The purpose of environmental risk insurance and environmental conditions for the legal implementation RIGHT IN THE BRAZILIAN MARKET

2.1 The environmental crisis and the legal and economic instruments for Environmental Protection

Given the context presented in the previous approach on the subject and started focusing on the legal perspective on the subject.

In a crisis context, the advent of mechanisms for the protection of the environment to ensure and promote the preservation of the environment and therefore the quality of human life, is a logical and necessary outcome. These mechanisms emerge daily, either through scientific, regulatory companies, or otherwise, for you to mention only to illustrate: new technologies, the establishment of environmental quality standards and emission standards, mechanisms clean development, legal frameworks, environmental licensing and environmental assessment.

It happens that there is, in essence, a great dichotomy in environmental issues, ie a potential incompatibility between development and preservation of the environment or, in other words, the intense conflict between developers and conservationists theses. Apart from these discussions, however, there is now the crowning of the current favorable to the idea that, with the help of innovation, you can search and development at levels consistent with sustainable modes.

Sustainable development, therefore, takes the concept of compatibility and, therefore, the creation of tools for harmonization between development and environmental preservation. In the field of the compatibility of the legislation has been going through the regulation of so-called economic instruments and, in particular, to protect the environment.

In Lesson Ferraz (2008), is, from the principles of economic, admitting that "'the logical imputation" the classic was compounded by the new way of thinking about legal rules "and before" the attitudes they have are tolerated, which is still considered legal, but we are interested in controlling, reducing and encourage their replacement by other more environmentally suitable, we must also think of the new Law explores the logical and effective responses that bring in these tasks.

Economic instruments for environmental protection are already widespread in the Brazilian legal scenario and deserve mention: the licensing and environmental assessment, environmental taxation, environmental compensation, payment for environmental services, reducing emissions from deforestation and degradation (REDD) and environmental insurance.

2.2 Climate change and environmental security: Distinctions and Characterization

Before delving into the legal analysis of environmental insurance, relevant weave a brief consideration of the distinction between climate change and the environment safe, since being issues close, you can generate a false sense of equality.

It is clear that dealing with climate change is an important delimited by insurance, while insurance is environmental separate issue.

In short, climate change, and environmental insurance have one thing in common, environmental issues, however, are separate issues and the proper distinction is critical to the proper knowledge and the improvement of these issues is insurance indisputable understanding of climate change and the perception of climate variability, especially due to emissions of air pollutants, the interference with the climate. Therefore, scientists contend, significant temperature variations occur in the opposite direction to historical measurements, the amount of rainfall in unusual periods or scarcity unpredictable wind, among others.

The consequences are all known, both in rural and urban areas (hurricanes, landslides caused by heavy rain, etc..) Such events, to ensure the safety of context imply the predetermination of risks difficult and therefore, among other The influence on prices (premiums).

Suppose, for example, in agricultural insurance. Any insurance company in the registration process will take into account the peculiarities of the area where the climate is inserted and the object of insurance (multi-risk, for example) and therefore consider an inventory of the history of climate. However, climate change indicate precisely the investment or the significant variation in historical weather patterns. Thus, the insurer simply does not possess reliable standards for measuring and pricing risk. Likely result: higher prices. It is evident, therefore, that climate change resulting from human degrading historical action, have the power to affect traditional insurance structures, with implications for characterization, quantification and qualification of risks, because dealing with the new damage (losses) caused by "nature" of man.

Very well. The environmental insurance, frank segment evolution, has another nature. It is safe to return here to the repair of the damage caused to the environment by human activity, especially for business. Some examples are: the discharge of effluents into rivers, contaminated water and killing fish or harm to human health of the populations that were supplied by the river is, soil contamination, air pollution, noise pollution , among others, affecting the health of the population and undermine the quality of the environment.

Once such environmental damage cause legal liability, which means, among others, the duty to repair environmental damage. For example, the recovery of degraded areas, restore the ichthyofauna, contaminated soil remediation and therefore treat the water table, and pay the health care of those affected.

These examples characterize called environmental damage and this damage or the risk is that the object of insurance is environmental.

Environmental insurance is subject to ensure that man cause environmental damage, while climate change refers to the damage caused by nature to human beings and their activities, influencing traditional insurance.

2.3 Environmental Security: Concept, nature and Regulation in Brazil

While not the insurance policy of the Brazilian market intended for environmental damage, the safe call of accidental damage to the sudden nature, they have a very restricted range. Therefore, it is argued that the restrictive coverages are not enough to ensure the promotion of an enabling environment to serve as a tool for environmental protection, either in the prevention or repair. This is because the legal interest worthy of protection, Environmental Law, does not fit the classical notions of civilian, especially related to property rights and the protection of individuals.

In the words of lucid POLISHED (2011), it is "not only diffuse rights and individual rights, whose assets have known title. We refer, however, the assets in the general interest of the community, no individual ownership: the diffuse. Goods of people, and future generations. "

Such a conclusion, with broad support legal jurisprudence and doctrine, derived from the system itself, the Brazilian environmental legislation and, more specifically, the constitutional provision, because the Brazilian Constitution in Article 225 states that "everyone has the right to half ecologically balanced environment, and the common use and essential to a healthy quality of life. "

Security Environment in the meaning and scope noted above, however, are not consolidated in the market today, although the increase of the Franks.

Among the difficulties in this application can be made, for example, (i) cultural issues, such as the false understanding of insurance as a mere mechanism for the transfer of responsibility, (ii) the early stage of the effectiveness of the rules environmental (legislative flexibility, discrepancies in case law, accountability and oversight of the fragile and inefficient), (iii) the so-called "Brazil risk" associated notes that investment retro away, and (iv) the absence of regulation legal.

Despite these obstacles, as we have said, there are signs of a recovery soon. On one hand, the apparent increase of insurance companies that are developing products more suited to the reality of the Environmental Law of Brazil. Second, the growing concern of the doctrine, with a significant increase in publications on the subject. Third, the stage of economic development who lives in Brazil, with increased investment in major infrastructure and energy production by requiring high-risk call for the supply of products designed to mitigate. Finally, recent news, due to the enactment of Law 12,305, of 02/08/2010, called the Law of National Solid Waste, which in Article 40 states that "the environmental licensing of projects or activities that work with hazardous waste national authority SISNAMA licensor may require the hiring of liability insurance for damage caused to the environment or public health, observing the rules on the use of cover and the maximum set by the Regulation. Sole Paragraph. Provisions established on the size of the company, according to the regulations. "

Although you can consider this standard as a "legal framework" for Environmental Security undoubtedly represents a first step towards regulation and, above all, for the institutionalization of environmental insurance as an economic instrument of environmental protection.

The law in question, when it comes to environmental insurance, continues a trend that is already evident in the European scene. Interestingly reference in Directive 2004/35/EC, which was adopted in Portugal by Decree-Law 147/2008 begin_of_the_skype_highlighting 147/2008 end_of_the_skype_highlighting, providing as follows: "Article 22. Mandatory financial security. 1 - Operators involved in professional activities listed in Annex III (eg

waste management, discharges to surface water / groundwater / impoundment of water, "transportation" - high risk) is necessarily one or more financial guarantees their own autonomous, alternative, or complementary, allowing them to take responsibility inherent in the business environment is needed. 2 - Financial guarantees may be through insurance underwriting, obtaining bank guarantees, participation in environmental funds or the creation of own funds for it. "

If there are strong indications that Brazil is moving towards the establishment of a secure environment more appropriate for the current level of environmental protection, or an "Environmental Risk Insurance", as it tends to consolidate terminology to designate this coverage insurance, primates that its development is linked precisely when environmental legislation and, more specifically, to the modern concepts and amplitudes of environmental responsibility.

Strict attention to the warning above is above all a question of risk management of insurers true. If the insurance contract back to "ensure the legitimate interests of policyholders (...) against the risk of default" under Article 757 of the Civil Code, the key environmental insurance accurately capture the current understanding of the responsibility civil environment because there is very little equivalent to the classical notion of civil liability. Only then will it be possible to determine in advance all risks and achieve success, including the consolidation of the market, this new stage.

2.4 Environmental Responsibility: The individual harm, damage and pure Eco Environmental Damage Sensu Lato

The liability insurance, as it is understood today, molds to the traditional notion of responsibility. In it, expert and objective teaches BECHARA SANTOS (2002, p. 58) that "no other purpose than to secure reimbursement to the insured what is going to spend to repair the damage they cause to others once characterized the blame, liability therefore, within the limits and conditions set forth in the contract. "

You are trying, therefore, the replacement of the assets of a third victim, with a refund of

the economic condition of the insured, when they met the elements of liability, namely, action or omission, injury, and among them , causation.

When it comes, however, environmental responsibility, everything starts to change. First, with respect to the action, we have environmental responsibility is objective, ie independent of the existence or degree of culpability of the perpetrator, under Article 14, § 1 of the Law 6.938/1981 so that no matter the fault-linking agent that came to the first element of responsibility. Thus, according MIRRA (2003, p. 69), "accountability degraded the environment, just to prove (a) damage to the environment, (b) an activity of environmental degradation and (c) of the causal link between the damage and the activity degrading fact, irrelevant to discuss whether or not the fault of the agent. "

It is therefore concluded that strict liability tends to facilitate performance # in defense of the environment when the character is restorative, that does not exclude the question most often tortuous, demonstration of injury and causation. What is taking place now is that in this case, because "it shows the relationship between cause and effect of environmental damage, the agent responsible for their obligation" (Milk, 2003, p. 202).

Another band with respect to causation, emphasized two points. First, is consolidating the jurisprudential trend to admit that, as a rule, reversing the burden of proof against the degrading programming, including the possibility of reversing the financial burden of proof. In this sense, reflects the judgment of the Superior Court of Justice:

Public civil action. Environmental damage. RESOURCE TOOL. Expert evidence. Reversal of the burden. ADVANCE BY THE DEFENDANT. DESCABIMENTO

Precedents. I - In case of public civil action filed by the Attorney General in order to assess environmental damage, were granted, the experience and the application of reversal of the burden and the cost of it, with the interlocutory appeal brought against that decision. II - creates or takes the risk of damage to the environment is required to repair the damage and, in this context, to transfer the entire burden of proving that his conduct was not harmful. III - agree, in case the reversal of the burden of proof, in fact, gives the company which has

the right to see repaired or compensated for any practice detrimental to the environment - Article 6 , VIII, CDC c / co Article 18 of Law No. 7.347/85.

Moreover, even in relation to the causal link, it is argued, especially in the doctrine of level, the adoption of more permissive criteria for characterizing causation. This thesis has proposed and supported by the legal field.

According Steigleder (2004, p. 203/204), the incidence of risk theory leads to attenuation total bail of cause and effect is not necessary to demonstrate a perfectly adequate and the right, just a "mere" connection "between the activity and the harm." However, it is worth noting the caveat that "such damage should be closely linked to the professional activity of the head, to see a connection between the injury and specific environmental risks of doing business or state. "

MILK and Carvalho (2007, p. 88) improve the approach to the slowdown of causality when it comes to the theory of probability, in the sense that the probability of "mere fact that a particular activity has caused damage to the environment should be sufficient for the employer's liability as that chance is decisive. "

If the traditional scheme of civil liability based on the classical scientific paradigm, was anchored in the belief in their ability to achieve a firm, according to this logic, requires the full test causality, probability theory is proposed break this pattern. By way of installing a module evaluation of probabilities, the authors caution that "legal causation involves an assessment of the probability / improbability of a given activity caused the damage in question" (milk and Carvalho, 2007, p. 92).

For the latter, with respect to injury, has been the most significant innovations. Damage to one or a few individuals is only a small portion of the extent of the environmental damage it is said that individuals and their assets is achieved only in a reflection. Relevant in this effort, the injury is the environment itself.

From the choice made by the Brazilian Constitution for the environment, is to realize that there are two dimensions of environmental damage, ie the possibility of damage to the environment, different from private property. In other words, there is no distinction

between damage microbem macrobem and the environment in which the damage to microbem private mainly affects those in possession of his domain, while macrobem damage refers to damage to the environment environment due consideration. Already in particular with regard to the damage to the environment macrobem, another differentiation is suggested by the doctrine, namely: first there is the pure ecological damage, other environmental damage in a broad sense. MILK (2003, p. 95) shows the pure ecological damage considering that "the environment can have a limited concept, that is, in relation to the natural components of the ecosystem and cultural heritage or artificial. In this range The environmental damage would mean pure ecological damage and protection are being made on some of the key components of the ecosystem. [...] The damage affecting property owned as intense nature in the strict sense . Rather, damage to the environment can have a wider range (sensu lato). This means that besides the pure ecological damage, there is another dimension, referring to the broad interests of the community, covering all components of the environment, including cultural heritage, environmental protection and all its components (Milk, 2003 , p. 96). It has always been so for conceptual purposes, three different amplitudes of environmental damage. To illustrate this distinction, so, use the appropriate lesson Steigleder (2004, p 122/123.), When presented the following hypothesis: Environmental damage sensu lato always superimposed on pure ecological damage and damage to the person, because two cases the interest is being damaged adjacent diffused in maintaining the quality of the environment. Therefore, an oil spill at sea, which produces water pollution and cause fish kills: a) the damage to individual fishermen who depend economically on fishing activity - due to the existence of several people linked to the situation of the same event, set homogeneous harm individual interests, the note remains the Guy - b) pure ecological damage because the marine ecosystem are still beaten in its essential characteristics, and, c) damage to the environment broadly as constitutionally protected value of the environment, water quality and biota will be severely affected.

2.5 Scope of Environmental Security The approach proposed in this topic was to discuss issues related to environmental insurance to assist with information and clarification in order to facilitate the screening and management of environmental risks to the insurance business. No thinking of environmental insurance in Brazil, today, leaving aside the specifics related to the new institution of civil liability, when applied to environmental issues.

It should, for the latter, a few observations.

Besides the typical function of the insurance contract, the projection of the risks, valid for different branches, and the security element as the object of the contract without #, environmental insurance is emerging as an important tool to protect the environment. Despite the fundamental principles on the environment focus on prevention and precaution in cases where it was not possible to avoid degradation of the environment, efficient mechanisms must exist for the repair or reconstruction of assets damaged environment. In this sense is the milk (2007, p. 180) that "nothing adiantariam precautionary and preventive actions are responsible for any damages were not required to meet its obligations or to account for their actions. Therefore (. ..) no need for the State to articulate a system that provides security to the community. "

To adapt to this reality, the Brazilian legal, environmental system, accountability is estribado triple. Thus, in addition to administrative and criminal responsibility, the cause of damage to the environment is liable, or is obliged to repair the damage caused to the environment.

Environmental responsibility, guided by the principle that the polluter pays, as the relevant legislation, effective and have serious concerns about accountability of programming that degrades the environment.

In this sense, the figures of liability under § 1 of article 14 of Law 6938/81, the possibility of piercing the corporate veil, where the personification of society can hinder the damage caused to the quality of the environment (Law 9.605/98, Article 4), or the possibility of reversing the burden of proof in legal proceedings aimed at degrading the responsibility of

the agent, and the imposition of the obligation to repair the damage to the environment , commonly made through a public environmental civil action.

Note that the legal system taking shape in the sense that the environmental damage once the damage and its effects must be effectively repaired.

In this context, there is no doubt that the figure of Environmental Insurance is to enhance the system security and repair damage to the environment.

Therefore, in the case of programming degrading lack of financial resources to fulfill its obligation to disseminate the relevant macrobem transgenerational, insurance coverage will be responsible for repairing the environmental damage. Even from the perspective of the benefits of the protection of the environment, the role has developed as Environmental Insurance "contracting expects its net assets not consumed in an action for damages. Moreover, victims have reached a guarantee that they will be compensated "(Trennepohl, 2008, p. 99).

Another band should be noted "insurers of the influence of companies on the adoption of environmental management practices" (Trennepohl, 2008, p. 99), to the extent that, for insurers agree to assume some coverage, not necessary to make demands and controls. In these cases, the insured will be bound by and faithfully, to prevent and mitigate the adverse environmental impacts. In other words, you must adjust to match the risks mentioned in the contract, spelled out in the policy, including as a condition of maintaining the coverage and thus aligning their business conduct and standards environmental requirements.

3 ENVIRONMENTAL INSURANCE AS A TOOL FOR ENVIRONMENTAL MANAGEMENT AND CONTROL

3.1 Introduction

Organizations of all types, looking to achieve and demonstrate a positive environmental performance, has taken measures to control the impacts, processes, products and services on the environment, in line with its environmental policies and objectives (ISO 14001:2004).

Although pressured by changes in Brazilian environmental legislation, in particular the principle of "polluter pays" principle in the National Environmental Policy - Law No. 6.938/81 (Paragraph 1 - "The polluter should, regardless of fault to compensate or repair damage to the environment and others, performed by their activity "), under Article 225 of the 1988 Constitution (Section 3 -" Procedures and activities considered harmful to the environment hold offenders , individuals or legal sanctions, civil and criminal, regardless of the obligation to repair the damage ") or the Environmental Crimes Act - Act 6905/88 (Article 3 -" Companies are responsible for administrative, civil and penalties as provided in this Act "), the increased focus on environmental issues in business did not come voluntarily. The actions in this regard were and still are a reflection of: moral obligation, sustainability, license to operate, reputation and market value (Porter and Kramer, 2006), or the occurrence of major environmental accidents that changed history of environmental awareness in society.

Concern over environmental issues, however, has taken increasing proportions in a scenario in which corporate social responsibility as part of strategic planning, budgets and business objectives.

Several environmental management tools have emerged, highlighting further improvement, dissemination and application of the same since the 1990s.

At present there are numerous environmental tools and technologies available, depending on how they apply, may pose a greater or lesser impact on the environmental performance of organizations. Examples of these tools are: Responsible, ecological footprint, carbon neutralization, Industrial Ecology, Environmental Audit, Management Systems, ISE Bovespa, Design for Environment (DfE), Eco-efficiency, Sigma Project, Global Reporting Initiative (GRI), Analysis of Life Cycle Assessment (LCA), Due Diligence, Green Chemistry, voluntary certifications, environmental impact assessment, gap analysis, and many others (Gallinari, SAGHY, 2009 apud Villela, 1998).

Although more recent (2004) and is still developing in Brazil, Environmental Insurance should definitely be part of the range of tools above. Not only for its end in itself, coverage

of environmental damage by sudden and gradual nature, covering the risks of both the insured and third parties, and operations that extend beyond the control of the insured (the example freight and local disposal / waste treatment), but also by a notice that is loaded at the time of underwriting and risk taking, given the technical nature and requires detailed evaluation.

Considering the environmental management measures and adopted a set of procedures to reduce and control environmental impacts generated by an organization or project on the environment (Valle, 2002), and that all these factors are discussed in the subscription environmental risk issue of environmental security policies, it is clear that the inclusion and ranking of insurance as a tool for environmental management.

An Environmental Management System allows management and control of environmental aspects and impacts of all or part of the processes of the organization, and may represent significant gains in terms of management, reflecting cost savings and economies of process.

In addressing the issue of insurance, it seems that all the measures described above may also reflect reductions in premiums and deductibles of the policy of the insurance company of the environment in question.

This theme has as main objective the discussion of Environmental Insurance as an advisory role, the importance of signing the risk (and all the factors to be considered at this stage), Environmental Security as a tool of control and environmental risk assessment and the incorporation of environmental security within a environmental management system of an organization.

.2 The Importance of Acceptance and Subscription Assessment and Environmental Risk Factors

Environmental risk analysis can be defined as a previous estimate of the probability of an accident and the assessment of their social, economic and environmental (Hahn, Rezende in Bitar and Ortega, 1998).

In the insurance market, subscription is the term used to describe any process that involves decision making selective acceptable risk (based on specific criteria previously defined),

the determination of insurance premiums and deductibles applicable contractual terms and monitoring decisions. All actions of an insurer against its insured are related and are the result of decisions subscription.

To support the decision of whether or not a particular risk are taken into account the relevant technical information, training, accident, company guidelines, reinsurance contracts, among other factors.

In the field of environmental risk analysis becomes much more specific and detailed, and given the technical nature of the subject, it is essential that only by experienced engineers in the environmental area such and Environmental Managers, Engineers Chemical Engineers Health, Lawyers, etc..

The financial evaluation on the operation of the insured property is mandatory, especially in situations involving the purchase and sale of houses and land, the remediation of contaminated areas and investments in projects and expansions.
Works with technical and specific questionnaires, allowing the subscriber to discuss the main aspects and environmental impacts of a particular production process or project. Among these are related:

Products offered: types and quantities of products stored on site, either in the form of raw materials, liquid fuels, gaseous end products or liquefied gas or solid waste. The definition of the materials stored on the site and allow the assessment of pollution potential of these substances to the environment, the severity in case of contamination of soil and groundwater, the possibility of chemical reactions between them and the eventual emission of toxic clouds (for substances such as ammonia, chlorine, etc..)

Equipment used: the computers that operate at high temperatures and pressures, which is the same age and ability, and periodic maintenance programs are conducted. The evaluation team may show signs of old equipment, poorly maintained and have the potential to leak, rupture or explosion.

Storage and containment. How products are stored - in tanks, drums, bags, etc., that the existing containment systems - dams, drainage channels, valves, circuit breakers, alarms

and locking systems, among others. It is essential to assess the existence of coverage, paving and waterproofing in local storage. This point may indicate critical points during the risk assessment, since the absence of containment barriers paving and chemical tanks, for example, may represent a high potential for contamination of soil and groundwater. The wastewater generated in the process: what are the effluents generated in the production process in question, so treatment and remission given to them, and what kind of treatment and referral gives the sludge generated in the process of wastewater treatment. The generation of industrial effluents is one of the most critical environmental aspects of certain processes. However, some plants have complex effluent treatment plants, which represent a substantial risk of injury in these cases, various chemicals that alternative. There are also cases where an effluent wastewater effluents generated even get in other treatment plants, characterized stations large volume capacity and, consequently, the risk of injury. Air emissions: what are the air emissions generated during the production process in question, that the treatment applied to them. Air emissions can represent certain processes critical, especially in residential areas usually on the possibility of injury due to the possible release of toxic substances, odor and particulate matter is high. With respect to the coverage of pre-contamination conditions existing or unknown, unknown environmental liabilities by the insured in hiring policy Environmental Security, more detailed information may be required, such as:

Preliminary Assessment

Stage Management of contaminated areas which aims to find evidence of possible contamination of soil and groundwater, through information obtained from historical studies, aerial photographs and field inspections (CETESB, 1999).

Research confirmed:

Step Management of contaminated areas carried out studies and research in order to prove the existence of pollution (CETESB, 1999).

Details:

Management Step contaminated areas that should be evaluated the characteristics of the source of pollution and environment affected by the determination of the dimensions of the affected area, the types and concentrations of contaminants and the plume to obtain sufficient data for purposes of risk assessment and recovery project (CETESB, 1999). Risk assessment: The process by which to identify and evaluate potential risks and that real change on the ground can cause to human health and other living organisms (CETESB, 1999).

Site Remediation Plan:

It is the technical basis for the governing body or an environmental watchdog to assess the possibility of whether to authorize the deployment and operation of the proposed remediation systems (CETESB, 1999).

This information is needed to know the local situation regarding environmental liabilities. These studies are usually available when searching for this type of coverage, since they are usually the result of contractual agreements of sale, according to which all due diligence reports have been ejecutadas.Algunas insurance companies offer to expand coverage options for transporting raw materials, finished products and waste as well as the co-responsibility in the areas outside the control of the insured (mostly local waste disposal and treatment).

When it comes to transport, once more information is needed, such as: (i) the type and volume of transported goods, (ii) the storage form of transport - in bulk or in special containers, (iii) Number personal vehicles, household and contractors, (iv) Number of

shipments per month, (v) emergency procedures in case of accidents. Coverage for pollution damage in transit can be a high frequency of claims and requires a structured and focused attention with regard to prevention and emergency response, so it is important to identify contracts with utilities to environmental emergencies, to provide a structure fast enough to attend events.

According to CETESB (2001), based on accidents involving dangerous goods requires special care when it comes to planning for the future adoption of logical procedures, technical and administrative coordinated and integrated structured to minimize the impacts these occurrences. Similarly, the response to these emergencies requires the availability of qualified personnel for evaluating decisions, and the triggering of actions consistent with the accident presented. Resolution No. SMA. 81 of 01/12/98 promulgated by the Secretary of State for the Environment of the State of São Paulo, provides, among other things, emergency assistance in the transport of dangerous goods on roads and states: "Article 3 - The emergency response plans related to the transport of dangerous goods, should be prepared in accordance with Annex I writing and presented to the CETESB - Technology Company Sanitation for the period indicated in specific applications. "

Thus, the State of São Paulo is mandatory for emergency care plans for transporting chemicals. However, this regulatory requirement is not standard for all states, sometimes working with different obligations to transport chemicals.

With regard to the place beyond the control of the insured, it is a cover that protects the joint responsibility of the waste generator throughout its life cycle, even outside its direct control. The issue of co-responsibility for the waste has recently strengthened the National Solid Waste in the following terms:

Article 27. The natural or legal persons referred to in art. 20 are responsible for the implementation and operation of the integrated management plan for solid waste approved by the competent body in the form of art. 24.

Recruitment to the first collection, storage, transportation, transfer, treatment or disposal of solid waste, or disposal of non-exempt persons or entities referred to in article liable for

damage that may be caused by the inadequate management of trash and 20. In this scenario, if finally the disposal site / waste treatment cause a condition of pollution of the environment and has no financial condition to bear the costs of site remediation, environmental agency can sue all customers page participate in the process for remediation / recovery of the same. The criterion of proportionality of the partition and adopted by the environmental body, may take into account the time of the disposal site, the type and volume was reduced, among other factors.

As an example we can mention the landfill Mantovani, one case of the popularity of environmental pollution in Brazil, he received between 1974 and 1987 all types of sewage contamination, soil contamination and groundwater. Currently, around 40 companies ex-customers of supply with landfill pollution prevention actions CETESB to continue spreading.

In this context, the details of these sites are also required for inclusion in insurance coverage, such as: (i) Environmental permits, (ii) information on environmental liabilities, (iii) the volume and type of waste sent to location, (iv) Start date of shipment of waste to the site.

It is worth noting some important tools for consultation, to be used in the underwriting process. The first and perhaps most important, Registration and rehabilitate contaminated areas of São Paulo state, updated and published annually by the Environmental Company of São Paulo - CETESB presents, in alphabetical order, the location of the site (area with potential contamination, suspected area of contamination, the contaminated area under investigation, the contaminated area or contaminated area in the monitoring process for rehabilitation #), the source of contamination, pollutants involved, affected media, measures emergency and approved remediation techniques in your case. From this source of information can be determined during your subscription if appropriate or that already have environmental liabilities, and technically evaluates whether a particular existing environmental liabilities could be separated from a potential new pollution event. As a practical example of this evaluation may cite the case of a landfill which receives

waste classes II-A and II B - # non-hazardous, but acting alongside an industrial landfill B, which receives waste Class I - dangerous. The characteristic of the liquid in the landfill leachate generated # The material should be essentially microbiological, derived from the decomposition of organic materials characteristic of municipal waste. Similarly, the liquid leachate characteristic generated in the B site must be mainly heavy metals and other toxic compounds from industrial waste feature. The evaluation of the environmental liabilities of landfill B indicates contamination of groundwater by heavy metals. However, the assessment of the environmental liabilities of the landfill that indicates not only the material related to microbiological contamination, but also heavy metals. That is, in any coverage of the new pollution conditions in the landfill, it is difficult to distinguish pre-existing pollution from the landfill or not B, a new scenario A. landfill pollution Like the State of São Paulo, Minas Gerais, through the state environmental agency - the State of the Environment Foundation (EGF) - also recently published a register of contaminated sites.

With respect to other States, the Resolution no. 420 of 28 December 2009 laying down the criteria and guiding values of soil quality and the presence of chemicals and establishes guidelines for environmental management of contaminated areas, creating a certain National Database Areas Contaminated, establishing the need for other states to create their databases, as described in Article 38 below:

Article 38. Environmental agencies, noting the secrecy is necessary, prescribed by law, which is publicized especially in its institutional portals on the World Wide Web information on contaminated sites and its main characteristics identified in the form of a report to be contain at least:

I - the identification of the area with information about the names of places and georeferencing, hydrogeological characteristics, hydrology and topography;

II - a (s) activity (s) contaminant (s) active (s) and inactive (s), primary and secondary source of pollution or the potential scope of the affected area due to pollution (accidents, spills, Improper disposal of chemicals or dangerous, and others);

III - contaminant source characteristics in terms of waste disposal and storage of hazardous chemicals, industrial production, roads and sealing area;

IV - the classification of the area in AI (contaminated area in research), AC (contaminated area), AMR (area in the monitoring process for rehabilitation) and

AR (rehabilitation area for the use indicated);

V - the current use of lands in the area and its surroundings, and action now bygone;

VI - the affected media and contaminant concentrations;

VII - the description of the property to be protected and away from the source of contamination;

VIII - the risk scenarios and exposure pathways;

IX - the forms of assistance, and

X-polluted areas critical

§ 1 The information given in the title should be made available by the state environmental agency IBAMA, which define and publicize institutional portal in its presentation, and the systematic organization of information.

§ The second module in the system implementation IBAMA institutional information that becomes public information provided by state environmental agencies in an organized and systematic necessary.

§ 3 The information in the report referred to in the title is the national database of contaminated areas.

Another important source, also prepared and published by the CETESB are reports of Cleaner Production (CP), which are, for various sectors of the industry, an overview of the environmental impacts generated during the process, and the measures that can be taken to minimize these. There are seven published reports: Pulp and paper, paints and varnishes; slaughter of cattle and pigs, white ceramic coating, refrigerators, industrialization beef and pork; Graxarias: materials processing slaughterhouses and cattle slaughterhouses and pigs, milk products, beer and soft drinks, tanning, jewelery, graphic arts industry, toiletries, perfumery and cosmetics, textiles.

It is also worth mentioning the issue of underground tanks. Tanks and underground facilities are generally standard exclusions of the policies. However, these facilities can add annotations that specify that tanks and installations covered.

As in the scenarios presented above, the underwriting risk and underground tanks is equally detailed, requiring a technical analysis of the following: (i) goods and the volume stored, (ii) The age of equipment and tanks, and (iii) periodic maintenance procedures - evaluation of leak testing, inspection and maintenance reports, (iv) the existence of alarms, leak detection and interlocking systems.

The same is true for underground pipes, which evaluate the extension products was carried detection process, control and treatment, among others.

Although the ideal situation involves the receipt and analysis of all the information listed above, it is noteworthy that there is some difficulty in obtaining this in full. This becomes even more critical when the risk in question involves a number of industrial plants located in various regions of Brazil, and for which data collection must be done individually on each floor.

In this scenario, the subscription process environment is certainly more complex, detailed and time consuming compared to other kinds of insurance. Step is essential, because it subsidizes the hiring of coverage requested and conclude whether or not to accept the risk in question. A practical example is given in cases of large liabilities, where current activity is similar to the plaintiff out and causing an environmental liability in the past, and which could hardly distinguish the situation of existing liabilities relating to a condition of pollution covered the current policy, the insurer can get to assume all the costs of the remediation of the site, regardless of the cause of this is the insured or the policy. Even Article 13 of Law 13.577/09 recently enacted State of Sao Paulo, which "provides guidelines and procedures for the protection of soil quality and management of contaminated areas, and related matters", determines and defines the Guardian as legal and care for the prevention, identification and remediation of a contaminated not only the cause of the contamination and its successors, and the current owner of the area, the owner of the

actual possession of it and who benefit directly or indirectly. In this scenario, therefore, that the insured in an environmental insurance policy can be fired legally for remedying environmental liabilities whose cause was not its actual performance. Finally, the approach is fundamental to the importance of the technical visits of inspection of risks in the underwriting process. Even with receiving full details, subsidize all the technical analysis of the above factors considered in the visit (s) location (s) becomes crucial in case of high risk, in which no document analysis merely allows a detailed description of all environmental aspects and impacts of the process in question. The technical visit to the site, along with interviews with plant managers, production areas, the areas of health, safety and the environment and finance, allows on-site assessment of all the factors described above, which can lead conclusions that may not be possible when the document analysis. The observation of safety procedures, control and cleaning company, demonstrating the important points as well as the perception of the routine operations of the company, which can show different aspects of theoretical procedures described in the questionnaire. The inspection also allows risk map of lines and the implementation and maintenance of improvement opportunities. Therefore, it must be done by a professional trainer, trained and specialized in environmental issues.

3.3 The insurance as a tool for Environmental Risk Management

The scenario presented above, brings the realization that the underwriting risk itself ends up working as a process of consultation procedures, processes, and environmental systems, and critical debate and transparency in the process, so that the parties get the best results and adequate coverage to the country's reality and risk. Reducing or non-acceptance of a risk for technical reasons, can consider a warning sign of the company in question. The same conditions set indicate that the aspects that should be improved with regard to the procedures and mechanisms for environmental management. Work on improving risk monitoring is recommended by the insurer, since the entities willing to take risks covered here on the network must have qualified and trained

professionals.

Visit inspection technique carries the risk of developing recommendations and opportunities for improvement that can also function as conditions for accepting the risk or the renewal of the insurance policy. In other words, environmental risks, when mismanagement or poorly managed, can hinder the renewal of the policy, as well as adverse wear companies put in default or contract compliance.

The analysis of some of the basic exclusions policies Environmental Insurance - Fines, penalties, willful default Administrative - further reinforces the obligation of the insured before the fulfillment of the statutory bodies of the environment, either locally , state or federal.

This context provides the realization of the importance of environmental insurance as a tool of control and management of the environmental risks of the organization, functioning not only as an instrument for the protection of assets, but also to control the important aspects and impacts. The environmental insurance policy is therefore bilateral, which creates obligations for both parties, both the insured and the insurer. Insured in connection with the performance of legal management procedures, and contractual risks and appropriate. As for insurance coverage and limits negotiated in the policy contract.

This importance, see now the legal standpoint of environmental protection, has been recognized and enforced by the government, which recently has been the introduction of the tool of environmental insurance on certain legal sanctions. As examples of these, include the National Solid Waste - 12.305/2010 Law, Article 40 states that the licensing agency may require the purchase of insurance for Environmental Sisnama licensing projects or activities that work with hazardous waste . The very act of the contaminated areas of the State of Sao Paulo - Law 13.577/09, as mentioned above, is presented as an instrument environmental insurance protection and soil quality management of contaminated areas, and requires submission of Insurance policy Environment or bank guarantee for cases where corrective measures are taken to moderation, to be applied to the entire operation of the system during its implementation period.

It is also worth recording the increasing application of Environmental Insurance contracts in the merger or acquisition between companies. Investors have insurance as a management tool for environmental liabilities at the close of such contracts. The policies of this nature are intended to cover environmental liabilities unknown nature by the policyholder, to ensure safety and provide greater contract compliance.

In the same list of contract requirements, the utilities in general, as well as outsourced contractors are already environmental insurance as a tool to manage their risks. Companies specializing in the operation of utility plants, water treatment plants and effluent and / or industrial solid waste management (regarding the collection, transport, storage, segregation and referral to treatment / disposal) , reclamation projects degraded areas, rehabilitation of contaminated areas, among others, are already subject to the obligation to submit the environmental insurance policy for the execution of service contracts. This is because the service contractor can become very responsible for any pollution caused by a contractor or subcontractor third, when providing services on their premises or outside, as the prerogatives of Brazilian environmental legislation initially approached.

Financial institutions and investors can also seek refuge in solutions related to environmental insurance. The financing gap resulting from the international crisis, for example, some agencies brought the reality of cost soil remediation and enforcement of an unfinished project. Highlighting the fact that the closure of a contaminated area can lead to accountability of all parties involved or interested in it, as highlighted in the Law 13.577/2009.

Clearly, therefore, the relationship, the inclusion and recognition of the various sectors of government, industry and services, regarding the use of Environmental Insurance as an important instrument of control and management of environmental risks and financial results.

3.4 The incorporation of environmental insurance within the Environmental Management System (EMS)

According Saghy and Gallinari (2009) quoted in the Valley (2002), Environmental Management can be defined as a set of well-defined steps and procedures to reduce and control the impacts caused by an organization or project on the environment. To be effective, the operating cycle of environmental management must cover all the steps that a project should be implemented, either a company or organization. Epelbaum (2006), states that the first models in environmental management more structured emerged in the 1970s, multinationals, due to increasing pressure for improved environmental performance. At that time, the operating procedure applies to units worldwide, marked with respect to environmental compliance audits of companies. Until mid-1980, the focus of these models focused on technological and legal aspects are intrinsically linked to the end of the control tube environment. The same author defines environmental management as the application of the principles of planning and control in the identification, assessment, control, monitoring and mitigation of environmental impacts to the preset levels.

British Standard BS 7750:1992 subsidized Environmental Management System first model, based on the systems approach to quality. This model defines the basis of another standard that was developed within the ISO (International Standards Organization), through its Technical Committee 207, the future ISO 14001:1996 (Epelbaum, 2006). ISO 14001:2004 - based on continuous improvement methodology known as Plan-Do-Check-Act (PDCA) - is voluntary and does not include environmental performance standards. It is designed to guide and improve organizational performance through continuous improvement of its environmental management, without claiming the tax rates of the minima and maxima (Valle, 2002).

ISO 14001:2004 - ISO 14001:1996 update - specifies requirements for an environmental management system allows an organization to develop and implement policies and objectives which take into account legal requirements and information about significant environmental aspects. It aims to improve the environmental performance and, therefore, is based on the premise that the organization will periodically review and evaluate its

environmental management system, to identify opportunities for improvement and implement them.

Some of the key steps in the development of an environmental management system following the approach of ISO 14001:2004, include:

1. Defining the scope of the environmental management system;

2. The definition of the environmental policy of the organization within the defined scope appropriate to the nature, scale and impacts of activities, products and services, commitment to continuous improvement and pollution prevention, compliance with applicable legal requirements and structured to establish goals and objectives, documented, implemented and maintained, communicated to employees and others available for public consultation.

3. Establish and implement procedures to identify the environmental aspects of activities, products and services of the organization that can be controlled (direct aspects) and those aspects that can influence indirect () within the defined scope.

4. Selection of environmental aspects that have or can have significant impacts on the environment (environment). To this stage, there are several methods for classifying importance. No single method to determine the impacts are considered significant. However, it is recommended that the method provides consistent results and include evaluation criteria related to environmental and legal concerns of internal and external stakeholders;

5. Identification of legal requirements: see what the legal requirements and how they apply to environmental aspects previously defined;

6. Creation and implementation of goals, objectives and environmental programs on significant environmental aspects, should be, where possible, measurable, and consistent as environmental policy, pollution prevention, legal requirements and continuous improvement.

7. Documentation: the scope, policy, objectives and targets shall be documented and updated;

8. Competence, training and awareness, employees and third parties should be aware of environmental policy, significant environmental aspects and their real impacts and benefits of improved personal performance of their duties and responsibilities to act in accordance with the system requirements management, among others;

9. Establish and implement procedures for monitoring and measuring operations can pose a significant environmental impact;

Based on the structure described above has a clear perception that all underwriting factors presented above can feed the database of an environmental management system, guide the evaluation of environmental aspects and impacts of great help in defining and goal setting and environmental programs, and assist in monitoring these implementations. Similarly, the Environmental Management System could subsidize the insurance company with important information about the evolution of the control and monitoring of significant environmental impacts, the verification of compliance with legal requirements and the adequacy of the points of improvement opportunities previously identified in the underwriting or risk inspection.

It provides, therefore, an opportunity to integrate these two tools, or inclusion in Insurance Management System Environment Environment, which benefit both the insured and the insurer in respect of: (i) The availability and access to information (ii) Work together to identify opportunities for improvement, (iii) work together in monitoring the implementation of these identified opportunities, (iv) the possibility of reducing the insurance premium due to greater control of all environment aspects and impacts of the insured activity in question.

Clearly, this integration is an issue not yet discussed. As with all environmental management tools and others noted that, in some way, also have potential for integration with an Environmental Management System, but not yet studied and developed. The integration is initiated in the first stage described above, namely to define the scope of environmental management system in question.

Unlike an environmental management system, in which the selection of the scope does not necessarily cover all the processes of the company concerned, the Environmental Insurance Policy will cover all operations of the insured at any given time (s) locai (s) - unless specified on the specific exclusions. Therefore, the key to start the discussion of integration is that the scope of the EMS and insurance are the same.

Article two of the definition of the organization's environmental policy is based on any substantial gainful activity and important from the point of view of insurance underwriting, environmental policy, and the knowledge and dissemination of the company's environmental practices all employees and employees for everyone is aligned with the procedures and processes that guide policy.

Items three and four, which establish and implement procedures to identify direct and indirect environmental aspects of the organization and criteria defined number and methodologies to assess the importance of them, is perhaps the most interesting subject of debate. This is due to the current ISO 14001:2004 is comprehensive and generic in this step. Requires the organization to identify direct and indirect aspects and define a methodology for identifying problems that could pose a significant #. However, it is the organization that determines the influence and importance of each point raised in the selected area, which can lead to ignore the significant impacts caused by it in other stages and therefore the importance of defining a common and comprehensive field between SGA and coverage of environmental insurance policy, as already mentioned.

Similarly, because the standard does not specify the minimum criteria and methodologies for selection and reasonable aspect possibly generating negative environmental impacts, the organization can choose the method that seems most appropriate, according to the criteria established by it , leaving room, once again, the gap in relation to a possible failure to identify significant environmental impacts.

This step is then the insurance underwriting risks undertaken by the subsidiary database of environmental aspects and impacts previously identified and defined by the organization, which works to complement this. This definition can be done through a questionnaire

including risk assessment, which includes questions on all relevant aspects and effects of environmental standpoint. Once the company's environmental specialist could make the comparison between investigations by the Insurer to the issues identified considerable and can find any deficiencies in important impacts.

The theme represents five major subsidy for insurance, as required legal documents, environmental permits and other relevant documents (such certificates for waste disposal in the case of coverage to places beyond the control of the insured), which in theory and would be available and documented in the Environmental Management System to organize, facilitate and accelerate the process of getting information and underwriting risk. The sixth point, the establishment and implementation of goals, targets and environmental programs on significant environmental aspects, which would be powered by the outcome of the application process, as discussed above, may indicate relevant points of improvement opportunities.

He recognized the importance of steps seven and eight, documentation and monitoring, including the nine-step process to renew subsidiary insurance policy, as is to establish procedures to monitor and evaluate the implementation of the improvements identified in steps above.

An environmental management model is considered within the PDCA cycle Environmental Insurance represents greater security, transparency and efficiency for both the insured and the insurer.

The model proposed and discussed above are far from the reality of the development, dissemination and acceptance of Environmental Insurance in the country. However, this discussion is interesting as it highlights the opportunities for integration Insurance Environmental Management System, and numerous other management tools and environmental monitoring.

Despite the distance mentioned, the fact is that the market operates and Environmental Security and demand information throughout the application process and during the period of insurance, which influence the continuous improvement methodology of risk. Therefore,

those who act in the environmental underwriting provides tools focused on risk management in order to understand and improve the practices adopted by the insured and are interested in purchasing a policy.

The participation of the Insured as interested in improving performance and improved environmental management and is critical to the success of both the policy to the contractor as a result of their own insurance, because a model designed and established, all processes related to the accident clearly and objectively. Thus, the environmental insurance contract for purposes of the prevention and protection becomes a tool of risk management and the financial return for all parties involved.

With the constant development of the environmental problems in Brazil and abroad, the pressure of society and government agencies, and the resulting increase in business investment in health, safety and the environment, it is imperative that the future to integrate these tools have been developed and have worked together to create positive and effective results for all stakeholders.

4 KYOTO AND ITS IMPACT ON THE INSURANCE INDUSTRY

4.1 Introduction

The establishment of the Kyoto Protocol and its flexible mechanisms resulted in a race of the signatories to binding targets for reducing greenhouse gases to replace technologies with high carbon emissions for cleaner technologies.

As a result of this movement, the carbon credit market began as an economic engine for attractive compensation issues within a country and between countries, thus facilitating the achievement of the objectives set. The quest for technologies with lower emissions of greenhouse gases has contributed to substantial growth of renewable energy sector. Concomitant with these changes in the world economy, the insurance industry has launched various types of products, and existing products tailored to ensure the performance of projects related to carbon credits and reduce credit risks of investors, buyers and other parties involved in this process.

However, the demand for insurance-related projects to reduce greenhouse gases and their impact on the insurance market is directly related to the adoption of effective policies to ensure that, worldwide, actions, continuous development of cleaner technologies. Thus, the study will be developed in this area, and analyze the impacts on the insurance industry due to the implementation of the Kyoto Protocol, also discusses the prospects for negotiations on a document to replace the Kyoto Protocol when it stops expired.

4.2 Actions of the international search for a solution to climate issues

Given the public concern with the evidence related to increased emissions of greenhouse gases (GHG) and its contribution to the increase in the average temperature of the planet, the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), created in the '90s, an intergovernmental working group to prepare for negotiations on an international treaty to address this issue.

As a result, on May 9, 1992, the Convention of the United Nations Framework on Climate Change, the text was adopted at the UN headquarters in New York. The Convention was opened for signature in June 1992 at the Earth Summit in Rio de Janeiro, of which Brazil is a signatory to the first, which took effect in 1994.

To promote and review the implementation of the Framework Convention for the Establishment of the Conference of the Parties (COP) through which the signatory countries meet annually to discuss the tools that are used to reduce emissions of greenhouse gases.

4.3 The Kyoto Protocol and its implications

In 3rd Conference of the Parties to the Convention of the United Nations Framework Convention on Climate Change (COP 3) held in 1997 in Kyoto, Japan, adopted an international treaty with firm commitments to reduce greenhouse gas emissions emissions targets and deadlines.

This treaty known as the Kyoto Protocol, is based on the promotion of international cooperation in the adoption of measures to reduce emissions of greenhouse gases. However, only countries with higher carbon dioxide emissions in 1990, listed in Annex I to the Protocol have binding reduction targets. Although these objectives are individual, the percentage reduction in the total country is at least 5% of the issuance of the period from 1990 to 2008 and 2012.

Flexibility Mechanisms of the Kyoto Protocol

To assist Annex I countries to meet their reduction targets, establish flexible mechanisms of the Kyoto Protocol. Through these mechanisms it is possible that the issue of reducing the EAO increase capture greenhouse gases are obtained through national borders. There are three flexible mechanisms:

JI (Joint Implementation) - Possibility of part of the Annex I countries to finance projects in other Annex I to generate Emission Reduction Units (ERU).

Emissions Trading (Trade Edition) - The Annex I countries that not only meet their goals, to overcome that can sell their surplus shares emission reductions.

Clean Development Mechanism (CDM) - Projects to reduce or eliminate emissions increasing greenhouse gases achieved in countries that are not part of Annex I. These projects aim to generate Certified Emission Reductions (CERs) Certified Emission Reductions. Among the activities that apply to projects of the Clean Development Mechanism (CDM) are energy, industrial processes (. Production of metals, chemicals, minerals, etc), use of solvents and other products, agriculture and waste. They are also subject to the submission of CDM projects, afforestation and reforestation.

These mechanisms have been adopted in view of the assumption that, because it is a global phenomenon, is indifferent to the location on the planet where the gas is emitted. That is, in terms of the greenhouse effect, it is important to set global emission and non-emission region.

In this context, the flexibility mechanisms serving as an inexpensive tool which allows

reductions occur where there is less investment cost and therefore more effective compliance, since there is a lower financial impact

4.4 Effects of the Kyoto Protocol on global insurance market

After ratification by Russia of the Kyoto Protocol entered into force on 16 February 2005. The European Union, which it signed the Protocol on 29 April 1998, was expected, and in 2003 adopted the European Directive 87, which stipulates that all reductions of anthropogenic emissions of GHG in the Community and its Member States, including 2008 and 2012 is 8% compared to 1990, higher than the percentage reduction scheme under the Kyoto Protocol.

However, due to additional efforts to reduce emissions of greenhouse gases, the EU adopted more stringent commitments European Directive 101/2008 begin_of_the_skype_highlighting 101/2008 end_of_the_skype_highlighting sets the goal of reducing, by 2020 at least 20% of emissions of greenhouse gases compared to 1990. As a result of adopting reduction targets set out in European Directives and the Kyoto Protocol (to the countries listed in Annex I), the flexibility mechanisms of the Kyoto Protocol began to be widely used in the adoption of measures to reduce greenhouse gases. Following these changes, the international insurance market has developed new products and adapt existing ones to provide various forms of security for the parties involved in reduction projects. Examples of such products are:

Carbon capture and storage: insurance coverage for technology projects using carbon capture and storage - CCS. This is a relatively new technology, which captures the carbon dioxide produced by burning fossil fuels and transported to a suitable location and injected into the ground to prevent escape to the atmosphere. The insurance CCS can be hired to: (i) Construction of the project (risk engineering), (ii) liabilities, (iii) pollution (environmental insurance) (iv) professional responsibility Environmental Consultants (Professional Responsibility Environmental Consultants) for professionals such as environmental

engineers, assessment and remediation business, due diligence, laboratory tests, etc.., and (v) political risk.

Guarantee financial Geological Carbon Sequestration: CCS supplementary insurance that provide financial security for the event of closure and post-closure of the sites with geological carbon storage. Includes supervision and operational phases of geological sites 10 to 30 years after closure.

Emission reductions: insurance reduction projects greenhouse gases. Faced with carbon credits earned within the flexibility mechanisms of the Kyoto Protocol (CDM and JI), the Emissions Trading Scheme of the European Union and the Voluntary Markets (Chicago Board of Trade, for example). You can buy separate policies for risk or comprehensive programs that include the same areas covered by insurance for CCS projects. Political risk and trade credit: insurance for participants from different countries in the carbon trading CDM and Joint Implementation. Provides protection for the parties involved in the project (project financial credit, investor, tenant and / or buyers) against the risks arising from: (i) government interference, (ii) Embargo (iii) the cancellation of the license, (iv) Acts of violence that could disrupt production, certification and delivery of carbon credits.

Renewable Energy: coverage for both the construction phase and the operation phase of renewable energy projects, such as biofuels, biogas, energy from waste, solar, wind and hydrogen energy.

Carbon Credit Delivery Insurance: Insurance for CDM and JI projects, involving the relationship between the two countries. The policy is triggered if there is a generation or delivery of emission reduction credits due to: (i) performance technology - when technology is inefficient or not reduced enough to generate carbon credits necessary, (ii) Credit risk - occurs when the bankruptcy or insolvency of the participants in the project before the delivery of credit, (iii) Price risk - when carbon credits are not delivered, buyers will have to return to the market to buy other credits to replace those no longer be purchased. The new loan can be more expensive than carbon credits traded in this case, the

purchase of more expensive credit is guaranteed by the insurance, and (iv) political risk. The purpose of this insurance is to reduce the cost of financing due to the granting of loans guaranteed. There are benefits for investors who have a guaranteed return on their investments, and for buyers, which will guarantee delivery of their statements. Another direct impact of the implementation of mechanisms to reduce greenhouse gases in the insurance sector was the partnership between the UNEP (United Nations Environment Programme), GEF (Global Environment Facility), with companies in the insurance market Insurance4renewable creating a Global online trading to develop customized insurance policies for renewable energy projects in developing countries. Among the products developed by Insurance4renewable are:

Counterparty Credit Insurance carbon - Sellers of Carbon Credits: insurance to cover non-payment of the obligations assumed by the buyer of carbon credits, which can undermine the viability of the project. Protects the "seller" of carbon credits, which is responsible for the project to reduce or capture greenhouse gases, risk of insolvency, non-payment of the buyer and country risks.

Carbon All Risk Insurance: insurance for renewable energy projects to the protection of: (i) All Risk Installation (EAR): safe performance of work. Protects the contractor for damage to the actual construction of equipment and machinery. You can include property damage to third parties, (ii) Delay in implementation (ESD) provides financial losses in case of delay of the start date of the project activities, and (iii) loss of profits. This type of insurance protects the owner of the project and its financial backers for damages incurred during the project implementation.

Kyoto Multi Risk Policy (KMR) - Sellers of Carbon Credits: comprehensive insurance policy to be effective MAP. Provides protection in case of a disruption in the operation adversely affects the financial viability of the project or incur closure. The project owner or lender, have the protection of: (i) the costs of CDM project, (ii) erection all risks (ear) and the delayed start (ESD), (iii) the property risks, machinery breakdown and loss of profits, (iv) Insolvency particular, v) climate risks, and (vi) the loss of carbon credits due to these

risks.

Kyoto Multi Risk Policy (KMR) - Carbon Credit Buyers: Insurance for the issuer that is the purchase of carbon credits. Policy with effect from multirisk MAP. It fits the same risks as policy Sellers carbon credit and political risk.

From lack of sun cover for loss of income when solar energy, and thus energy production is below a certain stipulated sum.

Wind Insurance: Coverage for loss of income in case of storms or lack of wind to avoid the turbine to generate power.

5.4 Clean Development Mechanism – CDM

As Brazil has ratified the Kyoto Protocol, its participation in the flexibility mechanisms is through CDM projects, to be the only mechanism among countries not listed in Annex I. From its inception until July 2011, a total of 7.742 projects worldwide was in some stage of the CDM project cycle, with 3214 already registered by the CDM Executive Board in 4528 and other phases of the cycle.

According to Costa, 2008, the demand for CDM has become a mechanism widely used, because experience shows that in industrialized countries, the cost of reducing a ton of carbon dioxide is between USD 15 and USD 100 in activities to improve energy efficiency, such as the shift from fossil fuels and small hydropower (SHP), while reducing the cost of the same amount of gas in a developing country is around USD 1 and USD 5. The projects to be approved, must meet the requirement of additionality, which requires that the project is economically more viable alternative, ie, run the "business-as-usual". This makes increasingly difficult projects are "eligible". In general, there is a preference for projects to present arguments to show that it would not be viable without receiving injection of CDM funds.

So in addition to a significant net reduction in emissions, there are other requirements for the project to be considered also as a preliminary classification of the start date of its activities, the identification of alternatives in accordance with current legislation and

regulations local investment analysis, barrier analysis, analysis of common practices and the impact of enrollment.

The CDM is a flexible mechanism that provides the greatest risk to the investor, the high degree of uncertainty and bureaucracy that exists for effective project approval by the UN, and the high transaction cost (about USD 100,000 to USD 150,000) involved. Despite these factors, it appears that the global carbon market, in relation to CDM projects, has moved a large number. According to the scientists of the Intergovernmental Panel on Climate Change (IPCC), financial flows to developing countries through CDM projects have the potential to reach levels of the order of billions of dollars a year. In September 2011, three records were achieved for the CDM: the highest monthly number of presentations of new projects (236) Program of Activities (16) and records (155).

4.6 Carbon Market and the Impact on the Brazilian insurance industry

According to the Ministry of Science and Technology, Brazil ranks third in number of projects registered with the CDM Executive Board, with 499 (6%), and the second to India, with 2,098 projects (27%), and China first with 3056 (39%). The country also ranks third in terms of emission reduction potential associated with the CDM project cycle, responsible for the reduction of 412,197,677 tons of carbon dioxide, which corresponds to 5% worldwide.

The expectation regarding reduction projects greenhouse gases in Brazil grew with the release of the National Climate Change on the eve of COP 15 in Copenhagen, Denmark in 2009. According to the document, the actions would result in emission reductions between 36% and almost 39% by 2020, based on projected emissions for that year.

In addition, at COP 16 in Cancun, Mexico, Brazil officially a plan related climate change, predicting the emission reduction of 730 million tons of carbon dioxide by 2020. This reduction is related to issues by the agriculture sector, which, according to the UN, is responsible for 14% of emissions of greenhouse gases.

Since Brazil does not belong to the Annex I countries of the Kyoto Protocol, while the

protocol is in place, you can make projects to reduce greenhouse gas emissions for carbon credits through the CDM, provided they meet the additionality requirements. Given this scenario, two national insurance companies have already announced the development of specific insurance products related to the carbon market. One of them, and provide warranty coverage for CDM projects involving traditional warranty insurance coverage, is developing a safe delivery of carbon credits. He also announces that he has the expertise to analyze the risks associated with the context of emission reduction methodologies, financial additionality of projects, market trends and prices of carbon credits.

The other insurance company has launched a product whose policy covers the loss of income if the project generates carbon credits provided and marketed by any inefficiency or physical harm of the project, the insolvency of the supplier or the buyer of the loans. Also be guaranteed revenue losses due to climate change issues through hiring additional coverage.

Moreover, the impact of reduction projects greenhouse gases in the insurance sector is not limited to policies directly related to carbon credits. In some sectors receive more investment for clean technology adoption, there is a greater demand for this type of insurance risk, particularly in the areas of property, engineering and responsibilities. The analysis of the segments where there is a higher incidence of CDM projects in the validation / approval is indicative of the potential increase in employment insurance.

Note that more than half of the projects are in the area of power generation. This is because, due to various resources available, the lowest costs are in the implementation of projects to improve energy efficiency, giving Brazil a comparative advantage in the carbon market (Fontenele, 2005, p. 09).

The growth experienced in the implementation of wind farms in Brazil is an example of this trend. The wind energy industry is growing 30% annually and the energy industry is more developed. Concomitant to this growth, the country's insurance industry has not only

increased the premium collection, but also promoted the development of experience with more precise criteria for analysis and risk management

4.7 Looking Ahead

Despite the high financial figures moved through the carbon credit markets, the commitments made by Brazil to reduce the possibility of the use of greenhouse gases of the flexible mechanisms of the Kyoto Protocol and the record numbers achieved in September 2011 in relation to CDM projects, the continuation of these practices in the long term can only be guaranteed with the adoption of partnership commitments to be fully effective. A few years ago, the countries belonging to the Conference of the Parties have discussed the criteria for the development of an international treaty to replace the Kyoto Protocol, whose term expires in 2012. Discussions in this regard, however, little progress. Contrary to expectations, at COP 15 in Copenhagen, Denmark, due to the lack of consensus between countries, especially between the U.S. and China, goal setting, the discussions were more about measures to minimize impacts global warming that the definition of strategies of prevention targets to reduce emissions of greenhouse gases. In the event, signed the "Copenhagen Accord", under which countries undertake that any increase in global temperature can not exceed 2 ° C. The paper argues that it should provide incentives for emissions from developing countries to maintain the same level, especially those with low emissions and that developed countries should provide financial resources appropriate technology, sustainable and predictable and training to support the implementation of the necessary measures for developing countries. The agreement also provides for the creation of a fund of $ 100 million in 2020 to the poorest countries in the fight against climate change.

The discussions around a document that can replace the Kyoto Protocol a little more advanced at COP 16 in Cancun, Mexico, with the adoption of a package of measures, known as "Cancun Agreements".

This agreement establishes a system of greater accountability on the part of governments in the fight against global warming and commitments with concrete actions aimed at the protection of forests worldwide.

Despite the progress made in the discussions have not yet reached a consensus to develop a legal instrument with binding targets for reducing greenhouse gases. Besides the difficulty in creating a dialogue between the parties, taking into account the various interests at stake, the gap between developed and developing countries, the question of who should bear the burden of reducing emissions, and the intransigence negotiations on aviation emissions, shipping management and carbon markets also hinder the establishment of an agreement. Considering these factors, some authorities believe that the adoption of a new global pact to reduce greenhouse gases in the COP 17 and will be held in November 2011 in Durban, South Africa, can hardly be achieved.

However, even if the document to replace the Kyoto Protocol has not been completed at COP 17, the strong pressure from civil society organizations from around the world and the private sector to adopt mechanisms to control emissions of greenhouse gases, which believe he will soon.

In October 2011, the fifth edition of the News Challenge 2 ˚ C, or Notice of Challenge 2 ° C, more than 200 world-renowned companies have signed a statement calling for governments to take measures to prevent climate change. In a statement, suggested a number of actions that governments can mitigate climate change, such as international collaboration and the creation of effective market mechanisms.

This trend is not different in Brazil. Each year, members and representatives of the private company, public and civil gather at the annual event platform to discuss business climate scenarios and trends in the context of climate issues. Measures like this have great impact on Brazilian public policies relating to emissions of greenhouse gases.

4.8 Completion

The insurance industry because of the demand in the carbon market, which offers a range

of products with a wide range of coverage, which guarantee to cover the stages of construction, operation, delivery of the credits, the responsibilities of the funding agencies, credit risk, price risk, and even political risk.

Globally there seems to insurance companies prepared to format custom-made for highly complex projects that require technical expertise, such as carbon capture and storage. This development has already reflexes, even shy, in the insurance market in Brazil and the launch of specific products related to CDM projects is a clear example. It should be noted that due to the reduction targets adopted by the National Policy on Climate Change and the country's investment in areas with wide applicability of CDM projects, the development potential if the insurance market is highly specific.

However, when it comes to insurance, there is great growth prospects for renewable energies like wind and solar power. Besides the increase in traditional insurance plans, the development of such technologies can increase the demand for insurance does not exist in Brazil, but already offered abroad, for example, the lack of sun and wind insurance. As the demands on the insurance market are directly related to the political and economic measures relating to emissions of greenhouse gases, the future of this market depends on the outcome of the resolutions adopted by countries to reduce emissions greenhouse gases. Although it has been evident in the recent Conference of the Parties, there is great difficulty in reaching a consensus on the criteria for making a treaty with binding targets that can completely replace the Kyoto Protocol, however, have the same deficiencies, adopting an agreement can be assumed, given the strong pressure from civil society and international private sectors for the government to take effective action to reduce emissions of greenhouse gases.

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CAPITULO III

REPUBLICA DE CHILE

IMPACTO AMBIENTAL EN LA CIUDAD DE SANTIAGO DE CHILE

SEGUROS AMBIENTALES

DR. RICARDO PERALTA LARRAIN

ACRONYMS

CONAF	**National Forestry Corporation**
CONAMA	**National Environment Commission**
COREMAS	**Regional Environmental Commissions**
PM10	**Particulate Matter**
SEIA	**Environmental Evaluation System**
SUM 21	**Sustainability and Environment for the XXI century**

REPUBLICA DE CHILE

IMPACTO AMBIENTAL EN LA CIUDAD DE SANTIAGO DE CHILE.

Dr. Ricardo Peralta Larraín

The city of Santiago de Chile, is located at 520 meters above sea level, along the Mapocho River and next to the Cerro Santa Lucia, in the center of the country. It lies in the longitudinal valley between the Cordillera de la Costa and the Andes, in a river basin filled by glaciers and volcanic sediments. To the east are visible snow-covered hills of the Andes.

This location makes the city in a city devoid of ventilation and winds have difficulty entering from the coast and if they do collide with skirts cordilleranas, producing a pocket of air pollution.

Its climate is temperate, Mediterranean-type with an average annual temperature of 14 ° C and low rainfall around 450 mm per year that focus on the months of May and August. The absence of winds in autumn and winter contribute to intensify pollution problems the city has.

Panoramic View of Santiago de Chile City

In the Republic of Chile, there are five regulated air pollutants:

Ozone (O3)

It is the main component of photochemical smog and one of the strongest oxidizing agents. It is formed from the action of sunlight indirectly in nitrogen oxides and volatile organic compounds in the troposphere and the action of the same in the ozone molecules in the stratosphere.

Sulfur dioxide (SO2)

It´s a gas which reacts at the surface of a wide variety of aerosols so that their action is enhanced by the presence of particulate matter. Most of the sulfur emissions released as SO2 (sulfur dioxide). Under the presence of moisture to form sulfuric acid which is present as solid particle aerosol, ie dela precursor particulate formation.

SO2 is produced by the burning of fossil fuels, smelting of ores containing sulfur and other industrial processes. This substance possesses irritant effects on the airways leading to broncobstrucción and obstructive bronchitis.

Nitrogen dioxide (NO2)

No liquid is yellow or red-brown gas. His anthropogenic those resulting from human activities, primarily reside in processes burning fossil fuels, coal, oil, methane gas at high temperatures.

NO2 is an important precursor to ozone formation. It is one of the components of air pollution caused by automobile exhaust. At home the main sources are gas stoves, paraffin stoves and ovens.

Gas toxicity is due to oxidative properties, their effects on health are the induction of pulmonary edema, increased antioxidant metabolism, cell damage to the lung.

Respirable particulate matter PM 10

PM10, is the fraction of particulate material of aerodynamic diameter less than 10 mm. For their size, these particles are able to enter the respiratory system, the smaller the diameter the greater the potential to harm human health.

The particles of diameter less than 2.5 mm penetrate the alveoli and enters the blood stream directly. The coarse fraction of particulate matter with a diameter between 2.5 mm and 10 mm in urban atmospheres as the city of Santiago de Chile, is mainly composed of suspended dust, which is a mixture of naturally occurring particles, other anthropogenic they have been recirculated.

C MONOXIDE (CO)

Carbon monoxide is a polluting gas which is produced by the incomplete combustion of hydrocarbons. In the city their main source are the vehicles, the main contributions resulting from vehicle emissions and into the home of stoves, cigarette smoke and water heaters.

This affects the health chemical component interfering with the transport of said heart, muscle and brain.

The National Environment Commission (CONAMA), in 2000 commissioned a thematic study on the status of the City of Santiago de Chile that produced the following results:

. Compared with other cities of the world, rules and recommendations on air quality, particulate matter (PM) is the most serious problem in Santiago de Chile, both in relation to the average concentrations of PM 10 and PM 2.5 of long term (annual) and the short-term (24 h) that happen during the most critical episodes.

Although the situation of PM pollution has improved considerably during the past 10 years, the levels are still too high.

. With regard to the standards and recommendations of air quality, ozone is the second major air pollution problem in the city of Santiago de Chile. Ozone is a natural constituent of high atmospheric concentration rarely reaches the earth's surface.

. During critical events, concentrations of PM 10, can reach very high levels due to adverse weather conditions, coupled with high emission intensity. Also during episodes conditions tend to be higher during the afternoon.

The City of Santiago de Chile has significantly improved the quality of health of the population, especially in young children, despite the morbidity of the respiratory system is still unacceptable.

The Atmospheric Decontamination Program (PPDA) should be expanded to include monitoring and regulation of pollution sources intradomiciliary.

ENVIRONMENTAL LEGISLATION AND REGULATIONS

In the Republic of Chile, concern for environmental issues is not new. From a legal standpoint, since the beginning of last century had issued rules to regulate specific aspects of human activity, as this has an environmental impact. Environmental legislation is divided into the following categories:

GENERAL ENVIRONMENTAL LEGISLATION

The General Environmental Law establishes the general framework of Environmental Law in Chile is Law 19,300 on the General Bases of the Environment, which sets environmental institutions: Environmental Evaluation System, citizen participation and the procedure for the issuance of Environmental Standards and the framework within which they must issue new environmental laws and amend existing ones.

Specific environmental legislation

Law 19,300 General Bases of the Environment, is complemented by a wide range of specific environmental legislation, environmentally relevant provisions of sector (Ministry of Health, Ministry of Agriculture, Ministry of Mines) applicable to various environmental

elements (air, noise, water, land, flora, vegetation, fauna, archaeological, historical and cultural), which establish requirements or specific requirements, generally aimed at the preservation or conservation aspects of environmental quality item I responsible for establishing emission requirements.

In addition to sectoral (Administratives rules) relevance above, there are legal rules of design and operation of some engineering work and related activities (transport, solid waste management, hazardous materials management, fuel management) with which it is intended that Final results of its application prevents the occurrence of environmental damage, in order to ensure sound environmental activity.

Another aspect related to the legal environment of operational requirement consists of the Sectoral environmental permits stipulated in Title VII of the EIA Regulations, which identify technical aspects - sectoral environmental permits required for infrastructure projects.

Sources of environmental information

Today, a wide variety of publications in which presents detailed analyzes and environmental legislation in the country. Among the more generic reference is the list of rules contained in the document entitled "Directory of environmentally relevant legislation in force in Chile" (CONAMA).

COUNCIL INDUAMBIENTAL National Cleaner Production

The environmental training program for vocational technical education Induambiental contributes to the formation of knowledge and practices on the sustainability of development and natural resource management, pollution prevention and cleaner production, from the perspective of their characteristics, impacts and possible solutions.

SUM 21 (SUSTAINABILITY AND ENVIRONMENT FOR THE 21ST CENTURY)

It is a program of the University of Santiago de Chile, which offers the community of Chile

and the world a new way to access information and environmental knowledge. SUM 21 states as a recognized program in Chile for his leadership, experience and collaboration in the development of educational resources, training programs and research in applied environmental science.

Environmental legislation and regulations

In analyzing the environmental legislation and standards have been based on information The Bases of Environmental Law Course Class 2 taught by Dr. Felipe Leiva Salazar, Diploma in Environment and Sustainable Development of the Catholic University of Chile.

Law 19,300 on General ENVIRONMENT

The rule 19.300, on General Environment, was published in the Official Journal in March 1994.

The rule states a computer process of environmental regulations in the country and make environmental institutions, the National Environment Commission (CONAMA) and Regional Environmental Commissions (COREMAS) and establishes environmental management tools.

The principles underlying the Standard are:

PREVENTIVE

POLLUTER PAYS

FAULT LIABILITY

GRADUALISM

REALISM

CITIZEN PARTICIPATION

RELEVANT STANDARD DEFINITIONS 19,300

. Environmental Heritage Conservation, nature conservation, environmental protection.
. Pollution Legislation.
. Sustainable Development: relation to quality of life
. Environment
. Pollution free environment

. Repair

Environmental institutions

Law 19,300 on General Environmental Environmental creates institutions which consists of:

The National Environment Commission (CONAMA)
The Regional Environmental Commissions (COREMAS)

CONAMA National Environment Commission, its main functions are:
. Propose to the President of the Republic government's environmental policies.
. Report to the President on the implementation and enforcement of existing legislation in environmental matters.
. To act as a consultative body, analysis, communication and coordination on

Environment related.
. Maintain a national system of environmental information.
. Managing Environmental Information Service (SEIA), coordinate the process of generation of environmental quality standards and determine their compliance programs

. Collaborate with the competent authorities in the preparation, approval and development environmental education programs aimed at creating a national awareness Environmental protection, preservation of nature conservation
environmental heritage and promote citizen participation in this matter.
. Finance projects and activities aimed at protecting the environment, nature preservation and conservation of environmental heritage.

COREMAS Regional Environmental Commissions have specific functions:
. Coordinate environmental management at the regional level.
. Managing the System of Environmental Impact Assessment and coordination of state organizations involved in this.
. Rule on Environmental Impact Statements and Environmental Impact Studies regionally.

DEPARTMENT OF THE ENVIRONMENT

It is a State Secretary in charge of collaborating with the President of the Republic, its main functions are:
. Design and implementation of policies and plans on environmental programs.

. the protection and conservation of biodiversity and natural resources renewable and hydro.
. This promoting sustainable development, the integrity of the environmental policy and its legal regulation.

LIABILITY for environmental damage

19,300 Law General Environmental Bases, in Article 2 paragraph e, define what should be

considered as environmental damage "Any loss, decreased, or significant impairment expense, inferred to the environment or one of its components" Moreover Article 3 of the statute, without prejudice to the penalties prescribed by law "Whoever willfully negligent or cause damage to the environment is required to materially repair cost if possible and compensate in accordance with law"No one is so strict liability. Moreover, it is important to note, that the rules on liability for environmental damage contained in special laws prevail over those of Law 19,300. In this situation there are the rules on marine pollution, covered by the Navigation Act, nuclear pollution regulating Nuclear Safety Act and agricultural pollution is governed by the Agricultural Protection Act. Is also regulated especially protection of forest resources in charge of which is the National Forestry Corporation (CONAF).

In Article 51 of the statute cited, reiterates the principle in Article 3, in that "Whoever willfully negligent or environmental harm will respond the same in accordance with this Act."

The action for damage repair

Chilean law gives the repair action for the environment, which does not prevent damage to the exercise of ordinary compensatory action by the directly affected. The holders of environmental action and for the sole purpose of seeking compensation for the damaged environment, natural or legal persons, public or private who has suffered loss or damage, the municipalities by the events in their respective communities and the State through the State Defense Council.

The standard accurately enshrines strict liability who owns or are in charge of a particular activity or medium potentially able to cause pollution and consequent obligation to indemnify and redress environmental damage even without guilt in the incident.Must be said that has not been frecente exercising this action.

INSURANCE

Chilean law does not provide any sign requirement to protect civil liability for environmental damage, the only exception covers cases in which the applicant wishes to obtain the approval of a project, the environmental impact, is subject to review and approval of the authority environment. Enshrined in Article 100 of Regulation

SYSTEM OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

The SEIA created by Law 19,300 on the General Bases of the environment, is an instrument of preventive environmental management, whose main objective is to determine, prior to its execution if the impact of a particular project or activity complies with current regulations .

Article 8 of that statute provides that the projects submitted to the SEIA, only be executed or modified after evaluation of their environmental impact. At the same time, Article 9 states that the "Environmental Impact Statement or Environmental Impact Studies will be presented to obtain the appropriate permits, before the Regional Environmental Commission of the region, which made the material works that includes the project or activity.

TEMPORARY AUTHORIZATION IN SEIA

The SEIA provides as a general rule, projects or activities that should be subject to it being unable to run in any of its phases or stages, prior to approving environmental qualification, which of formalized through the Environmental Qualification Resolution . Despite this restriction, Article 15 of the 19300 standard provides an exception to this general rule, the so called interim authorization allows a project or activity can begin execution as prior to the issuance of the Environmental Qualification Resolution. The interim authorization, is temporary, granted by the competent organ of the National

Environmental Commission (CONAMA), so that in cases properly evaluated, begin implementation of a project or activity undergoing evaluation in the Impact Assessment System Environmental, prior to its environmental qualification is resolved. The validity of the interim authority, ceases when once the environmental assessment process of the project or activity is issued the relevant environmental qualification resolution.

INSURANCE POLICIES COVERING ENVIRONMENTAL DAMAGE

Insurance policies that cover environmental damage, which cover the environmental damage in the implementation phase of a project such as environmental damage arising after final approval.

The interim authorization shall be granted by hiring insurance guaranteeing any liability for damage to the environment. This type of insurance is mandatory, most unusual in practice.

Legal nature of the policy contract

The text of the insurance contract, doest not responds to a policy contract, with a uniform and standard text used in all insurance policies.In practice the few times it uses the policy mentioned in the law used the ruse of a policy of warranty

Moreover, there are various types of policies that cover environmental damage except from sudden execution of a pending environmental project that occurs suddenly as a result of the exercise of any activity, such as overturning a truck carrying a liquid or other noxious thing, which is shed as a result of the accident. These models of policy coverages are voluntary recruitment, given that Chilean law does not provide for the obligation to have an insurance that covers liability for environmental damage.

The coverages mentioned Riders are awarded by the policy of General Liability insurance. Liability Coverage for Pollution has the following characteristics:

- The pollution event occurs at the location indicated in the Special Conditions.
- That it is an accidental, random and extraordinary.
- The fact is not a normal consequence of the processes taking place in the secured facility.
- The event is beyond the control and anticipation of the insured.
- That the environmentally harmful effects manifest as sudden or concomitant, ie signs manifest for the first time within 72 hours feel at the beginning of the emission, discharge, injection, deposit, download, leak, spill or filtration agent coverage.

Exclusions:

- Liability for damages

- Liability for damage to any property, real or personal, that sena currently or have been owned, occupied, leased, or used by the insured, or who are or have been in care, custody or control in any capacity.

- Liability for damage resulting from the operation of the facility standard insured, not caused by an accidental, random or extraordinary.

- Responsibilities for genetic damage caused to persons, animals or plants.

- Liability for damage resulting from the so-called acid rain.

- Responsibilities caused by waste, radiation, vibration, odor, electromagnetic fields or any kind of waves.

Liability Coverage for Pollution Assimilated (Lloyd's Non Marine Association) This does not cover the additional cost of removing, remove, or undo the effects of the substance producing clean seepage, pollution or contamination is caused by a sudden event,

unintended and unexpected happened during the term of the insurance contract.

LIABILITY INSURANCE COVERAGE INCLUDING gradual pollution

The pollution insurance, or appears gradually manifests yy whose exact origin is very dicficil to clarify, the risk is not insurable in Chile by the Chilean Insurance Companies. This is a large insurance premiums higher insured amounts and only the large companies hire foreign insurers, the insurance market in London, Switzerland and Germany.

MARINE POLLUTION INSURANCE

Marine pollution is treated and punished in Title IX of the Navigation Act, which are described and prohibited concomitant activities or events, establishing who is responsible for ensuring the authority to enforce its provisions (Directorate General of the Maritime Territory and Merchant Marine), sanctioned the liability for damages caused by the oil spill and other harmful substances.

Article 146 of the Navigation Act, requires any ship or vessel of more than three thousand tons, out insurance or other security issued by a bank or an International Fund for Compensation for sums amounting to the limits of liability referred to in Article 145.

CONCLUSION

The topography of the city of Santiago de Chile, considered one of the most polluted cities in Latin America, makes the metropolis in a city devoid of ventilation, solutions to this problem can not be palliative, formulándonos the following question: In what form the city of Santiago de Chile can be displayed as a clean and free of smog? . The solutions, according to the analysis of this research, are essentially implemented through sustainable programs and high stringency standards, encouraging innovation by cities and mainly polluters.

The highlights are the long-term projects, promoting recycling, treatment of waste, reduce the use of natural resources and inform the public about environmental respect. The action of environmental protection, which is the subject of legal and administrative regulations in Chile falls on the following areas: air, water, noise, waste, light pollution, the global atmosphere and biodiversity protection . Law 19,300 on General Environmental broadly regulates environmental issues, based on the principles Preventive, Polluter Pays, Responsibility, Gradualism, Realism and Citizen Participation.

Nevertheless,. Chilean law does not provide any insurance requirement to protect civil liability for environmental damage, with the exception of cases in which the person seeking enforcement of a project before obtaining approval.

Moreover, it is worth mentioning that the existing insurance which cover environmental damage coverages are voluntary membership.

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Dr. Felipe Leiva Salazar

May 2011

ENVIRONMENTAL PROTECTION AND INSURANCE.

IF CHILE

Dr. Osvaldo Contreras Strauch

CHAPTER IV

REPUBLIC OF URUGUAY

Municipal solid waste

Dr. Roxana Corbran

ACRONYMS

AMM	**Metropolitan Montevideo**
COTAMA	**Technical Advisory Committee for Environmental Protection**
EIA	**Environmental Impact Assessment**
IMM	**Municipality of Montevideo**
LEPA	**General Law of Environmental Protection**
LOM	**Municipal Law**
MERCOSUR	**Southern Common Market**
MVOTMA	**Ministry of Housing, Spatial Planning and the Environment**
PRT	**Regulatory Technical Proposal**
CSR	**Special Solid Waste**
RSI	**Industrial Solid Waste**
ROC	**Waste Civil Works**
SWM	**Solid Waste**
SDF	**Final Disposal Site**

REPUBLICA ORIENTAL DEL URUGUAY

RESIDUOS SÓLIDOS URBANOS

Dra. Roxana Corbran

In the Oriental Republic of Uruguay, from the eighties began a process of reflection on the themes related to the environment, health and development, synthesized by the National Environmental Study.

The legal framework, highlights the lack of a national standard that comprehensively regulates the management of solid waste. Moreover, from a technical standpoint is identified a low level of attention paid to the service of waste disposal, where most of the departments operating open dumps.

In this research develops the legal framework on urban solid waste, disposal, environmental issues and recycling of organic matter.

SOLID WASTE

The Oriental Republic of Uruguay is divided into 19 departments, the administration thereof is exercised by the municipal mayors and departmental boards. The population census is 3151.662 inhabitants, with an average annual population is around 0.5%.

An analysis of solid waste sector in the Republic of Uruguay, based on growth characteristics, socioeconomic indicators have been identified that characterize homogeneous regions.

The main national institutions related to the sector of solid waste and the entities responsible for the services have developed in the current institutional structure is not perceived inclusion sector.

Regarding the legal framework, highlights the lack of a national standard governing the management of solid waste.

Technical studies identified a low level of attention paid to disposal service, where most of the departments operating open dumps, existing procedures still burning animal feed and open waste.

With respect to infectious and hazardous solid waste from hospitals not interhospital you categorize as standard practice.

Legal and institutional framework

Legal Framework

The Constitution of the Oriental Republic of Uruguay has relevance to the waste management in the following areas:

Environmental aspects: Article 47 of the said Rule, states Environmental protection interest.

Decentralization: Article 50 of the Constitution, the state defines promote decentralization policy and Article 262 provides for the possibility of interdepartmental agreements.

Departmental Revenues: Article 297 assigns the authority to departmental governments levy fees and charges for the provision of services by the departmental governments as well as to enable the collection of taxes on real property and collection of fines.

Municipal Law (LOM) N ° 9515: Passed the 28th and October of 1935, provides for the jurisdiction of provincial governments for the provision of services for collection, transport and disposal of the "household waste" and on the cleaning of the streets and places of public use. At the same time the standard assigns competence Municipalities "animal health", in the control of activities that may affect the environmental, water, soil, air.

The law creating the Ministry of Housing, Spatial Planning and the Environment MVOTMA No. 16,112, enacted rule on 30 May 1990, commissioned MVOTMA in regard to environmental issues, "the formulation, implementation, monitoring and assessment of urban development plans and regional and national policy implementation in the field.

Law on Environmental Impact Assessment EIA No. 16,466, enacted on 19 enro 1994, states that "Everyone has the right to live in a healthy environment and to have access to basic public services" and defines the EIA procedures and environmental authorization.

General Law of Environmental Protection LGPA No. 17,283, enacted on 28 November 2000, is the regulatory mechanism of environmental issues and define the MVOTMA, in

accordance with the departmental governments, shall make orders necessary to implement appropriate regulating the handling of waste

Functions of the Ministry of Housing, Spatial Planning and the Environment MVOTMA In regard to environmental issues, the MVOTMA applicable:
1 - The formulation, implementation, monitoring and evaluation of the national environmental advocacy and implementation of national policy in this regard.
2 - Coordination with other government agencies, national and provincial, in the execution of their tasks and coordination exclusive integrated environmental management of the State and public entities in general.

With regard to waste, states that the MVOTMA, shall make orders and apply the necessary measures to regulate the generation, collection, transportation, storage, marketing, processing and disposal of waste, in accordance with departmental governments. Nevertheless, the scope of the powers of MVOTMA is delimited to what could affect the environment.

Departmental Governments

Play and departmental governments have historically played important skills related to environmental and environmental protection in general and with regard to solid waste. The LOM Municipal Act, contain a number of provisions regarding the powers and duties of the departmental authorities. A comprehensive policy analysis and the absence of specific regulations for residues, it follows that the departmental governments have powers over the management of all waste that may have environmental consequences.

Regulatory Framework

The Oriental Republic of Uruguay is in a growth process when it comes to environmental standards and waste have a more defined legal framework.

Law 17.283

Environmental Protection Act

Enacted in 2000

Declares the public interest to protect the environment against any impairment that may arise from the handling and disposal of waste

Law 9515/935

Municipal Digest: household waste and waste

Enacted in 1935

It gives governments the authority to departmental management of municipal waste.

Law 16,221 and 17,220 / 99
Basel Convention on hazardous waste and income
Accession 1999
Accession of the Republic of Uruguay and the Basel Convention banning the entry of hazardous waste to the country

Decree 499/992
Hazardous Waste
Year 1992
Appoint competent authority to the Ministry of Housing, Spatial Planning and the Environment for the implementation of the Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal.

Decree 252/989
Hazardous Waste
Year 1989
Prohibits introduction to areas under national jurisdiction, of any type of hazardous waste.

Law 16,230
Radioactive Waste
Enacted in 1992 alo
Prohibits, without exception, transit and disposal of radioactive waste from third countries, throughout the national territory.

Decree 586/009
Medical Waste
Year 2009
Establishes the need for adequate management of the centers of health care, amending Decree of 1999.

Decree 373/003
Batteries used
Year 2003
Sets the extended liability to the manufacturer / importer and the need for management plans for lead-acid batteries.

17.849/004 Law
Law on Packaging and Packaging Waste
Enacted in 2004
Sets the extended liability to the manufacturer / importer and the need for management plans for post-consumer packaging.

Decree 260/007
Packaging Act Regulations
Year 2007
Set limits, management forms and criteria for the development of container management plans established by Law 17,849.

Decree 541/007
Sanitary Solid Waste Management of Ports, Airports, Terminals International passenger load and MERCOSUR border points.
Year 2207
Approves Resolution 30/02 of the Southern Common Market Group regarding the criteria for the management of solid waste sanitary ports, airports, international passenger load and border MERCOSUR.

Law 16.466/94
Law on Environmental Impact Assessment
Enacted in 1994
Defines the assessment regime governing environmental impact for new ventures of certain type.

Decree 349/005
Regulation of Law 16 466 Environmental Impact Assessment
Year 2005
Regulates the system of environmental impact and determines that enterprises must have

environmental authorization associated undertakings are included the installation of treatment plants and solid waste sites open new waste disposal or expanding existing ones.

Law 18.308/08
Land Use Law and sustainable development LOT
Enacted in 2008
The guiding principles and sustainable land management in the national context.

Law 18.719/11
2010-2012 National Budget Law
Enacted in 2011
Interprets Article 39 of the Law on Territorial Organization and sustainable development, excluding the prohibitions of rural land use including waste disposal.

Decree 411/011
Investment Promotion
Year 2011
Declares activity promoted treatment and disposal of industrial solid waste.

SOLID WASTE PLAN

The Solid Waste Management Plan of the city of Montevideo and the metropolitan area (PDRS) was developed between 2003 and 2004 with the ultimate aim of bringing about proper management of all general waste in the metropolitan area. It covers:

Municipal Solid Waste (MSW)

Industrial Solid Waste (RSI)

Waste of Civil Works and Construction (ROC)

Solid Waste Sanitary (RSS) former hospital solid waste (RSH) and special solid waste. The Waste Management Plan includes all stages of waste management and technical stage,

economic, institutional and legal are related. Are analyzed within the various stages of the environmental management, economic, institutional and legal.

The Plan follows the international guidelines used in waste management such as

Principle of hierarchy of waste management

Establishes an order of priority for care of waste and reduction, reuse, recycling, energy recovery, disposal. The principle states that the possibility must be exhausted from the previous operation before applying the next

Principle of Integrated

Indicates that proper management of waste is required set of tasks and infrastructure taking into account that a single infrastructure is unable to achieve the complexity of managing different waste management. An advanced management is coordinated within all levels and areas of waste managers to achieve a well functioning management and enable continuous improvement of the system.

Prevention and preparedness

They are principles that are set out in the Environmental Protection Act. In Article 6 of the Act provides as one of the principles on which to base environmental policy should define, and specifically states "The prevention and prediction are criteria priority over any other in environmental management and, when there is danger of serious or irreversible damage, it may be invoked lack of full scientific certainty as technical or reason not to take preventive measures. "

These principles will guide the selection of technologies, looking for those that are proven and universally accepted, not presenting technical questions about their impacts, both health and the environment.

Polluter pays

It is one of the best known principles of environmental management, also known by the slogan "the polluter pays". Today this principle is rarely used in the management of solid waste in the AMM, however its use is important to achieve a fair management, where the residue responsible pay for their proper management.

Conceptually you can understand the "polluter" as the "generator", since they are always delivered waste must be collected and treated in some way, generating costs. However it is noted that in some cases the contamination is caused by inadequate waste management, which is not always the responsibility of the generator (eg informal management). Under this principle also protects the principle of responsibility maker / importer, applied to products for mass use.

Reduction of hazardous waste

This principle seeks to prevent, if possible, and to the extent feasible to reduce the production of hazardous waste, subjecting them to management to prevent damage to the environment and public health. It is a complement to the principle of hierarchy that seeks to prioritize actions in waste reduction that can be considered dangerous. Although the amount of hazardous waste within the RSU is small, it is important to follow this principle, considering the high impact that can have its mismanagement.

Transparency

Transparency of decisions to be made regarding waste management is the basis for understanding and acceptance by the generators of the planned measures. Only in this way can there be the necessary support to the planned changes, which often require a change in the attitude of the generators. It has a particular importance in the area of tariffs where generators must be able to understand the reasons that led to the decision and fee rates

Flexibility

While it is possible to establish general guidelines governing a system for a long period of time, as is expected in this case, you can not pretend that all standards remain in effect for

the period considered. Therefore it is necessary to provide the system to be created and proposals arising, with sufficient flexibility to

can go adapted to changes in time.

Continuous Improvement

Finally, just as it is possible to set the guidelines for the operation of a system for a long period of time, it is possible that these guidelines are implemented immediately, requiring a phased implementation with ongoing reviews of the same. This leads to the implementation of the principle of continuous improvement on the one hand, always look for an improvement in the social and environmental situation of the system to be implemented with respect to existing and secondly also aims at increasing the effectiveness of the implemented system.

Objectives of the Master Plan for Solid Waste

The Master Plan, seeks primarily to achieve a proper solid waste management in the metropolitan area of Montevideo, through the following objectives:
Minimize environmental and health impacts, generated by the solid waste management.
Establish an effective, efficient and environmentally sustainable, from waste generation to final disposal, prioritizing activities according to established principles.
Achieve improved instrumentation and systems proposed in the Master Plan for Solid Waste through management acceptance by the community, economic and financial support and periodic readjustment of long-term master plan.
Harmoniously integrated into the solid waste management activities with other environmental, health, education, and production of the country, promoting individual and collective values of respect for the environment.

Waste considered in the Master Plan

The Master Plan includes all solid waste generated in the metropolitan area of Montevideo, only excepted radioactive waste. Internationally, within the waste includes waste solids and semi liquid waste falling outside the traditional wastewater treatment.

Municipal Solid Waste (MSW): MSW are solid waste from urban activities in general either occurring or domestic residential, commercial, institutional, small industry, fair, those from the sweeping and street cleaning , parks, recreational areas and beaches. Included in MSW from cutting the grass and trimming trees, dead pets and furniture and fixtures, waste from construction works and minor home repairs. Industrial Solid Waste (RSI): The RSI is waste from industries, agribusiness and services under solid, semisolid or liquid phase those wastes which, by their physicochemical characteristics, can not be handled in traditional effluent treatment liquids. Within the PDRS RSI have been divided according to the provisions of the Technical Proposal for Regulation of the integrated management of industrial solid waste, agricultural and service (PTR) in:

High and medium danger

Low danger

Hazardous waste from households,

Contaminated waste and civil works

Chemical waste laboratory centers health care

Hospital Solid Waste (RSH): These are the solid waste generated in health care facilities, are distinguished common RSH RSH contaminated. The RSH contaminated solid wastes are those that may pose a risk to health or the environment either because they have or might have features potentially infectious, corrosive, reactive, toxic, explosive, flammable, irritating and / or radioactive. The common RSH are considered within the MSW system.

Civil Works Waste (ROC): The ROC include construction and demolition waste, residues and waste excavation maintaining roads.

Special Solid Waste (CSR):

Lead-acid batteries depleted

Life vehicles

Life tires

Oils and Waste Electrical and Electronic

Waste management in Montevideo

Storage and collection of Municipal Solid Waste

In Montevideo there are a variety of ways of storing solid waste from small generators that are associated mainly to population density and the collection method used. These are: individual storage against property, private collective storage, public and collective storage dumps.

In some neighborhoods of Montevideo metal containers are being installed with lateral raise, which have been well received by the population.

The 60% of MSW is collected by harvesting Montevideo formal. The system operates in various modes such as municipal collection system, under contract with third parties, and private management agreement.

The 40% of the waste generated is collected by the informal sector consists of removing waste storage points, before formally collection vehicles pass. The informal sector classifies waste collected in reusable and recyclable waste, generating discards unused. This disposal is 70% of the waste collected informally. Of these about 30%, corresponding to 90 t / day are burned or dumped into waterways. The remaining 70% returns to formal systems.

Used for collection compactor trucks with boxes of 14m ^{3}. The lateral lift system of metal containers, used trucks 25m ^{3}. For landfills, it generates the informal open trucks are used.

Collection of discards

For reasons of health and environmental issues arising from the work mode of classifiers, the IMM created several programs to collect discards product of the existence of the informal sector to avoid its negative impact on the environment such as pollution of streams.

The main materials that are recycled from MSW in Montevideo are: paper, cardboard, metals, plastics and glass. These materials end up in national or foreign companies that recycle, and generally handled through intermediate depots.

A presents himself raising animals (pigs, horses, pets) to separate organic matter of MSW. This activity involves a potential risk to human health and animal health.

The plant remains from the maintenance of green areas and the sweep of fairs are used by the quartermaster for composting at the composting plant Tresor.

Formal recycling activities respond to private initiatives and not to a general plan for the institutions.

Although the quantities of waste being reused or recycled by the informal sector can show significant, it is noteworthy that the procedures used generate serious problems of pollution in waterways and several deficiencies in waste management in the city of Montevideo.

Disposal

The Municipality of Montevideo has the waste disposal site (SDF) named Felipe Cardoso. There will also receive all the waste collected in Montevideo, the City of Costa, which

together reach the 1,300 ton / day. 2 is currently operating fronts burial 6-7 Usina one in the other in the new plant 8.

The final SDF operations of Felipe Cardoso is estimated for 2007, but could extend its life until 2011 if the planned works are completed in the Plant 8 and on the basis of actual amounts that enter there.

The disposal site has no basic measures needed for reducing environmental impacts.
Currently not performed daily coverage of waste are collected and treated or leachate. It has a very close presence of surface water courses, immediately receiving the impacts of the SDF, especially Usina 6-7.

Sweeping and cleaning

In the department of Montevideo sweeping management is done in different forms, the collection and sweeping coverage in urban areas is high and has been evaluated positively by the population. Cleaning services are generally adequate although there are negative impacts such as waste disposal to water courses that have not been controlled. These impacts are mainly generated by classifiers informal living and working in settlements along waterways. Collecting Municipal sweeping service is the responsibility of the Regional Units. The service is performed through open with Dump trucks, optionally when there is no availability of these vehicles is realized by collecting compactor trucks. For some areas of Montevideo that have fixed containers, has begun to make the storage and collection of these wastes together with RSDPG (Small Solid Waste Generators) The collection and transport of emergency services, Beaches and Necropsy is provided using open trucks, frequencies, schedules and amounts vary raised the demand for the service.
The maintenance of public spaces and green areas is the responsibility of the Greenbelt Unit Decentralization Department, which has several contracts with private companies that

are responsible for the maintenance of public spaces and green areas. These contracts include the collection and transportation of waste generated by these activities.

The reality is that at present are the projects and standards but garbage in the city is not correctly handled by municipal garbage going long in one place and containers in unhygienic conditions. There is no control of the garbage pickers pulled stir and leave at will. Unfortunately inspectors general who are the ones who should control the streets are seen pruning but those who leave the corners containers in such conditions. In some parts there are trash receptacles to distinguish green and orange solid organic waste. Before this instance had to put on white bag and organic glass,

paper, plastic, orange bags shortly lasts no where to get orange bags also had to buy hard not even a month to give them promotion in supermarkets city. Then a reporter did research classified as trash bags from oranges that had created great expectations in the population of many environmentally friendly, but the surprise was that I get to where waste is deposited in the city and they were all mixed. Regarding pruning, in places with trees and gardens the neighbors must contract on an individual who withdraws his pruning because if not fined by the Commune, or hire a transfer to specific locations that need to be taken by the people themselves, this service is not provided by the municipality and other countries.

Cases have occurred in people who leave their pruning versus another house that end up being fined without responsibility this has led to complaints from neighbors but so far the situation remains in changed.

We believe that a solution to the Municipality took over the collection of pruning and thus create a heating system of community centers

Industrial Solid Waste

Solid waste is defined as waste in every phase solid, semisolid or liquid phase wastes those who by their physicochemical characteristics can not be admitted to the traditional treatment of liquid effluents.

Legal Framework

The Uruguayan legal framework on waste is still at an early stage of development and this is particularly evident in the case of industrial solid waste (RSI). So far have not identified specific national standards, although a technical proposal for the regulation of RSI (PTR) Among the senior national standards of implementation include the General Law of the Environment Protection Act and which the regime derives EIA. Other national standards are derived from the prevention and control of pollution from lead, which accept and

regulate the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which regulate animal feeding waste and National Regulation on the Transport of Dangerous Goods by Road. There are also specific regulations departmental level that apply to certain stages of the process, such as the transportation and disposal of municipal RSI in the SDF. Also in Law No. 17,296 was provided that the departmental governments should establish location areas within its jurisdiction, for RSI treatment plants.

On the PTR, both the technical content of the same as its process of development, involving all relevant actors in the field are evaluated positively by the Consultant and why its existence has been considered as a theoretical framework for analysis. As such in this report assesses the impact that the implementation of the PTR in all stages of the management of RSI.

However identified some specific aspects that can be improved PTR and motivate the recommendations presented in the report body. The main suggestions relate to the absence of an explicit definition of the term residue and the omission of explicit reduction as a prelude to any waste management process. In this respect the judgment of the consultant would be desirable for the PTR establish a hierarchy of waste management steps: reduction, reuse, recycling, energy recovery and disposal.

A weakness to highlight on the PTR is the fact that for more than a year since it is approved by the COTAMA but not yet legally implemented.

Generation

Currently in Uruguay there is a record full continuous quantities generated RSI. Also, there is no regulation or obligation generators to quantify the generation of RSI and report it to authorities.

This may change with the passage of the PTR, which requires generators develop RSI Management Plans covering all stages of the management process and in particular RSI, understanding their classification and quantification.

In general we can say that the management of RSI lacks regulation and control. Therefore many practices apply environmentally unsuitable for storage, transport and disposal of RSI.

Reduce and reuse

The two initial stages of solid waste management, reduction and reuse, have in common that make internal processes to the activity of the generator. Both phases are looking to increase the productivity of the manufacturing process and reduce the amount of waste to be handled later. This concept is commonly identified as "clean production". The reduction and reuse practices are not widespread in the generators of the AMM, but highlights a growing trend in adoption over time. In some cases these practices can be a competitive differentiator for certain companies in a particular industry, so do not generalize to other companies in the same sector.

The cultural inertia of the industrial sector is a constraint to incorporate technological changes or changes in production processes necessary to implement some form of reduction and reuse. In most cases, those identified are not relevant as to have no significant change in the production process, with minor adjustments simply result. Many of them are focused on the handling of containers.

The application of these practices can be stimulated indirectly by applying the benefits of being "environmentally friendly practices", which provide access to some markets and certifications. Current programs of this nature, which seek to encourage the application of these practices in the field of industries from the implementation of environmental management systems, and still have marginal results purely symbolic, taking perhaps most successful in reducing some types of highly dangerous RSI that a significant reduction in volume. These programs also usually do not provide specific mechanisms to finance the investments needed to implement some reduction practices. The existence of informal practices or very low cost for disposal of RSI (mostly a simple discharge field) also discourages the implementation of reduction and reuse practices. The lack of regulation of the sector of RSI, with no standards and controls, power that situation.

The demands of the PTR will result in an increase in the cost associated with the removal of RSI, which will result in an economic incentive for generators to analyze from this new perspective the advantage of reduction and reuse practices.

Recycling and energy recovery

Recycling and energy recovery seeking to recover and take the waste energy or the same in another production cycle, reducing the amount of waste that must be eliminated.
In 2003 we recycled aproximadamente81.500 tpy of RSI, while about 19,000 tons / year were valued as energy. The total recovered RSI, 100,000 tons / year, reaching 35% of total waste generated.

Particularly in the AMM currently no compost market capacity to absorb potential output. TRESOR compost just over 6,000 tons per year of RSI, the 150,000 ton / year potentially compostable.

Valuation practices of waste and recycling especially, are of great environmental relevance since their use involves significant environmental benefits. Nevertheless, currently in the project area identified practices are few and there is significant potential to develop additional practices, while not cater to large volumes of waste may involve hazardous waste themselves to medium and high.

Some of the practices are currently performed positive and others are inappropriate situations. the presently employed no environmental safeguards to consider acceptable practices

An incipient culture of recycling, but little known in industries AMM departments. In this regard it is important that there is a trash bag as seed and potential for recycling waste, but currently is restricted only to the field of chemical industry.

Environmental Analysis

The RSI system has some features that are proper and that makes it different to other solid

waste systems. These features include a variety of types of waste, the existence of waste with different characteristics in terms of dangerousness, lack of clear rules for the management practices of the same and the absence of a clear allocation of responsibility for implementation of these practices, the lack of adequate infrastructure for handling, treatment and disposal of medium and high hazard in an environmentally safe.
In view of the above findings on the main environmental impacts identified are:
The waste management in the field of generators still presents many problems, mainly due to lack of clear procedure for the separation of the most dangerous waste.
Prolonged storage of waste currently no accepted way of elimination in the AMM, constitutes a significant risk in the medium to long term.

Valuation practices used, suitable from environmental thinking, do not always have the best operating conditions and can sometimes cause a transfer of pollution generated, although in most cases they are environmentally acceptable.

The provision in the SDF Felipe Cardoso RSI low hazard no significant environmental impacts, although RSU recharge the system. This situation occurs not suitable stimulus generators to reduce the volume of waste produced. As for Felipe Cardoso provision of other types of RSI most dangerous, although not the most appropriate from the environmental point of view the alternatives currently

available can be much worse, producing unacceptable environmental impacts.
The practice of unauthorized places available or not properly controlled has been quite common across industries and is perhaps the major environmental problem and one of the largest liabilities that they have generated. The three main ways in which this practice is performed are waste disposal in landfills, disposal in the very land and provision in leased premises, all presenting significant environmental impacts.

Hospital Solid Waste

The system of RSH is regulated nationally, by Decree 135/9912

begin_of_the_skype_highlighting 135/9912 end_of_the_skype_highlighting which aims at the integrated management of RSH nationwide.

According to the decree RSH generator is the center of health care, defined as "any public or private one where you pay any level of health care, for the prevention, diagnosis, treatment, rehabilitation, research or teaching"

The decree defines the following types of waste:

Hospital Solid Waste: All solid waste generated in health care facilities. Hospital Contaminated Solid Waste: All solid waste hospital suffering or have characteristics that could potentially infectious, corrosive, reactive, toxic, explosive, flammable, irritant or radioactive and can, therefore, constitute a risk to health or the environment.

Common Hospital Solid Waste: All solid waste hospital not to be considered a solid waste contaminated hospital. Generators being generated by RSH and large public and private

(Hospitals), medium (clinics) or small (doctors, dentists, veterinary etc). The collection and transportation companies engaged exclusively in the collection and transportation of contaminated RSH authorized trucks meeting the requirements imposed by the decree.

Generation

In 2003 the AMM generated an average of 4.9 tons per day of contaminated RSH. The internal management of RSH in health centers must be in accordance with details as in the management plan prepared by them. Decree 135/99 makes clear that the common RSH should be placed in black bags, the infectious yellow bags and sharps in rigid containers which are then placed in yellow bags. Special wastes are treated according to their characteristics that merit, some of which are placed in yellow bags along with infectious and sharps. In most health centers can be found waste disposal points with yellow and black bags. Separation of RSH in common and is contaminated by the staff of health care facilities, ie physicians and nurses mainly. While arranging the rigid sharps containers is

carried out in an acceptable manner, the separation between core and has its problems contaminated. Overall the staff is not trained enough and when in doubt, tends to dispose the waste in yellow bags, increasing the amount of contaminated RSH RSH common. However, there are cases in which contaminated RSH are arranged with common. In many centers, there is no incentive to change the situation and improve the internal management training their staff, since the service of collection and treatment of contaminated RSH is hired by a fixed amount.

In hospitals and clinics yellow bags are collected and closed for cleaning internal staff and transported daily storage, where they are placed in covered trays provided by the transport companies. The tubs guarantee future storage and handling safely. When the tubs provided are insufficient, the yellow bags are stored on the floor.

There exist in the refrigerated storage AMM residues that could decompose rapidly (eg pathological wastes) or collection vehicles are also equipped with cooling.

Environmental Analysis

Environmental analysis was performed of the RSH system, analyzing impacts 22. Below are half significance and impact of high aspect related to environmental situations and All aspects and impacts of significance situations with medium and high are associated with problems such as inefficient separation between common RSH contaminated collection problems with large vehicles, the transport length and the exclusion of small generators in the system

HAZARDOUS WASTE BY ENTERING TRANSPORT

The law considers 17,220 hazardous waste "those wastes whatever its origin, that their physical, chemical, biological, radiological or present a hazard to human health, animal, plant or the environment" (Article 3), and has a reference to the Basel Convention for implementation.

This standard although we have not seen much application of it and there should be strict control of several vehicles that enter through the borders, the provision for fines and criminal penalties. Criminal responsibility and gives a legal tool to judge to act exhausted after the instance by the executive.

The transport that stands out in the articles is the ship that seems to be the more situations that have been established that when there is reason to suspect that a vessel sailing the waters of the Republic would try to make hazardous waste dumping in these waters, the competent authorities shall take the preventive measures they deem appropriate and initiate appropriate legal proceedings.

CONCLUSION

The historical evolution of the system of Solid Waste in the Republic of Uruguay, moving towards a more effective change and cleaner.

At the government level, it is noteworthy Inter cooperation. Municipal which has increased in recent years with concrete as the execution of Solid Waste Master Plan. Moreover, in the town there is a good perception mostly positive, compared to current performance collection services, sweeping and cleaning.

With respect to the informal sector waste pickers primarily operates in inadequate working conditions, causing an environmental impact arising from the physical presence and operation of disposal sites.

Regarding industrial solid waste, generators do not prioritize the reduction, recycling, energy recovery. Most service industries apply the criterion of minimum cost to the handling of waste.

As for the solid wastes contaminated are part of this system. Management weaknesses are minor, because the development of treatment for this type of waste is sufficient, would be of great importance to the participation of all generators and the separation of hospital solid waste and hospital solid wastes contaminated common, which is not performs optimally.

The solutions according to the analysis of this research, are essentially sustainable, nesting reduction processes, recycling and energy recovery.

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CAPITULO V

REPUBLICA DEL PERU

GLACIARES, CAMBIO CLIMATICO Y AMENAZAS

Dra. Miryam Elisabeth Aragón Espejo

ACRONIMOS

INAGGA	**Instituto Andino de Glaciología y Geoambiente**
IRENA	**Instituto Nacional de Recursos Naturales**
UGRH	**Unión de Glaciología y Recursos Hídricos**

REPUBLIC OF PERU

Glaciers, Climate Change and THREATS

Dr. Miryam Elisabeth Aragon Espejo

The Republic of Peru is located in western and intertropical South America. The country's territory is composed of diverse landscapes, valleys, plateaus and high peaks of the Andes, which are deployed to the coast and the Amazon desert east. The Republic of Peru, owns more than 70% of Latin America's tropical glaciers, the 19 giant snowy mountain ranges with glaciers, are located in the northwest and in the southeastern Andes between 8 ° 33'S, 77 ° 53'W and 14 ° 44'S, 69 ° 13'W. The largest is the Cordillera Blanca mountain range with an area of around 700 km2. These masses have played an important role in the life and development of the country because they have made additional reservoirs of water resources for human consumption agriculture, energy production and industry.

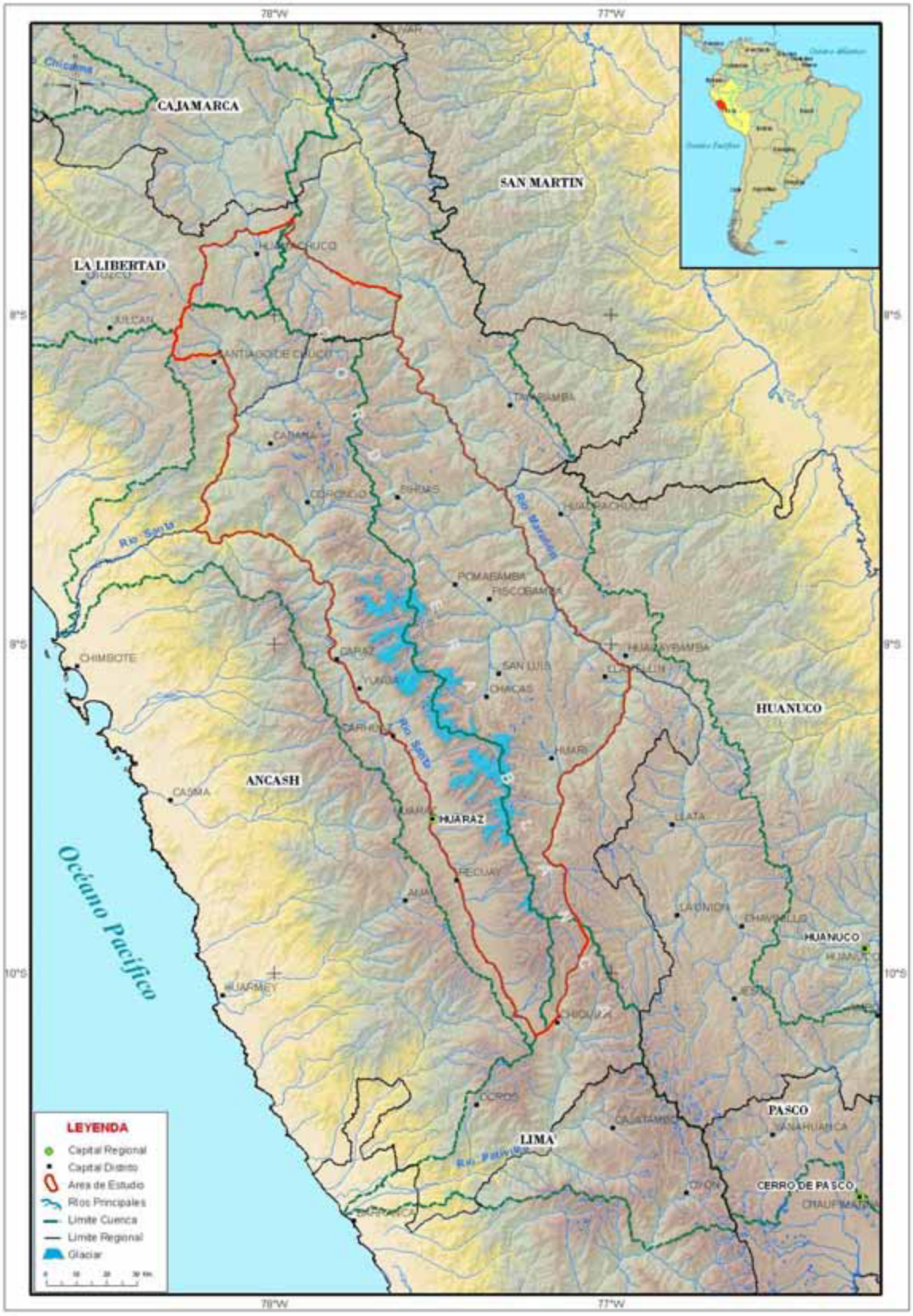
The scientists studied for decades, the retreat of the glaciers of Peru not only for his contribution as water resources, but also because in some cases have caused major disaster.

Legal framework

The Law on Water Resources Law 29,338, enacted on March 31 of 2009, regulating the use and management of water resources under Title I General Provisions in Article 5: "The water covered by the Act" includes in subsection 7 "of snow and glaciers" The National Water Resources Management, is part of the National Environmental Management and aims at the sustainable use of water resources, so the policy enforcement and national water resource strategy at all levels of government .

THE retreat of glaciers

The Cordillera Blanca is located in the Central Andes of South American continent, its limits are between 7th coordinates 41'31" to 10 ° 10 '57" South Latitude and 76 ° 54' 57" to 78 ° 18 ' 1" West Longitude. This region of the Andes in Peruvian territory is divided into three sectors: North, Central and South. The glaciers of the Cordillera Blanca are in the western branch of the Northern sector and extends in the direction N30 º W from snow to snow Pelagatos Rajutuna, with a length of about 210 km linear
The Cordillera Blanca is the mountain range that acts as a watershed between the Pacific and continental slopes of the Atlantic in this sector of the Andes. The study area covers an area of about 16.073 km2 area defined according to its axis, from which extend the flanks of its slopes to the west and east, finding in both directions to Santa and Marañón rivers as natural boundaries , coming to include altitude levels ranging from 500 meters (Tablachaca river confluence and Santa) to 6.701 m (Huascaran glacier system).
The area is composed by 52% by the Marañón river basins (left flank), 47% of the territory of the Santa River basin (right side) and 1% of the surface of the river basin Pativilca (right flank).


78°W
77°W
8°S
9°S
10°S
CAJAMARCA
SAN MARTIN
LA LIBERTAD
ANCASH
HUANUCO
PASCO
LIMA
HUÁNUCO
HUÁRAZ
CHIMBOTE
CASMA
HUARMEY
CERRO DE PASCO
Río Santa
Río Marañón
Océano Pacífico
LEYENDA
Capital Regional
Capital Distrito
Area de Estudio
Ríos Principales
Límite Cuenca
Límite Regional
Glaciar

In your area there are many peaks, mountains and glacial systems, according to the separation of deep gorges and long stretches are divided into 14 separate systems. 7 million years ago formed the batholith granodiorite of the Cordillera Blanca in the midst of intense volcanism, orogenic this process is related to the subduction of the Nazca Plate Along the ridge there are abundant signs of glacial activity, such as glacial cirques, U-shaped valleys, moraines and lagoons periglacial arches. Successive glaciations have defined their geomorphology, however those of the past 300,000 years have been of importance to the Cordillera Blanca, the last one being the so-called "Little Ice Age".

The main change in climate since the early 1940s to 2000 was experienced with the ambient temperature. From 1948-1976 the average temperature time series show a similar behavior and is from the year 1977 which is a break or change in the trend, which manifests itself in an increase that is consistent with the observed changes in other regions

the planet and for the case of the Cordillera Blanca was an increase of 0.5 degrees It also reaches the set temperature rise in the last years a series of episodes caused ENSO recession and accelerated deglaciation contributing directly to the formation of gaps periglacial, to increase the discharge into rivers existence of hanging glaciers and the retreat of glaciers.

In the Republic of Peru, in 1970 there were 18 major glaciers and snowy mountain ranges areas covering an area of 2041 km2 (UGRH) in 1977 will have 1595 km2 (INAGGA) is that in the course of only 27 years, the reduction is 21.8% which represents a considerable loss of ice masses or no accumulation zone.

In the Cordillera Blanca in 1970 it had an area of 723.37 km2 glacier (UGRH) in 1997 was determined 611.48 km2 (INAGGA) taking a loss of glacier area 111.89 km2 which represents 15, 46%.

In Ancash Department gaps exist about 1000 representing 8% of total country. INRENA through Unit Glaciology and Water Resources, conducts studies to evaluate and monitor the behavior of glaciers and highland lakes in order to prevent and mitigate risks and natural disasters due to landslides, mudslides and overflowing lakes glacial and prevent future water shortages, promoting their sustainable utilization for multiple purposes in the geographical area of the Cordillera Blanca. At the same time, these studies on glaciers and high mountain areas are closely related to the issue of global climate change. The scientific community believes that by 2020 all glaciers that lie below 5000 meters will be gone. These glaciers not only provide water, but also electricity so the challenges for policymakers will be increasingly linked to current Environment.

MITIGATION

The NGO Glaciers of Peru, whose mission is to increase the size of the planet's cryosphere and consequently, contribute to global cooling of the Earth and the preservation of

freshwater reserves that are in solid form in glaciers.
The principle is to increase the ground albedo and consequently reducing the emission of infrared radiation in the atmosphere.

Reflecting Most shortwave radiation into space, greenhouse gases absorb less heat and therefore issued to the lower surface of the Earth infrared radiation originating a cooling process of the troposphere from the bottom up.

The area conducive for applying this principle are the mountains of the Andes located more than 4,500 meters.

When applied in a certain area of the White Mountains cover high ability to reflect shortwave solar radiation, immediately starts the cooling process. By lowering the air temperature creates conditions conducive to snowfall, so grows cold generated by local cryosphere.

The cold generates more cold. The coverage is to use a compound similar to a film made of mineral elements contaminants. Its albedo is 80%.

Generating artificial environmental conditions necessary to recover the growth dynamics and hydraulic balance of the snowy, through mitigation of heat reaching the glacier, by applying white reflective albedo coverage exceeding 80%, on surfaces adjacent rock surrounding the snow between the valley and the glacier. Expected effects that promote the conditions for development of a feedback cold painted with a white reflective cover:
or by mitigating the greenhouse effect on painted surfaces around the snow:
or decreases the temperature and humidity on the surface.
o As a direct consequence, cool breezes snowy valley reaching amounting to less height, mitigating the effect of the merger having warm moist air when it reaches the glacier.
Remoteness wind or rising warm contributes to increased wind down the snowy cold of the ablation zone, with the trend towards the emergence of a layer of snow or frost on dark firn and ice albedo increases and decreases the merger.

or Zoom dark rock surfaces painted in white adjacent to the snow and ice mitigates thermal radiation coming directly to the glacier in electromagnetic form.
A greater or lesser white reflective surface glacier mass loss.

By creating a barrier or furthest from the snowy cold:

o The Valley hot wind rises vertically cooled by expansion to form supercooled clouds without consuming the snowy cold energy.

o The wet season creates favorable conditions for the production of these clouds. or increase the likelihood of solid precipitation on the surrounding snow and painted white.

o Because coverage applied white reflective rock surfaces maintains a constant high albedo and not variable as snow:

o During the day minimizes the absorption of solar radiation and mitigates the emission of thermal radiation.

Consequently mitigates or nocturnal emission of infrared radiation, increasing the likelihood of condensation on painted surfaces as snow or frost.

o The establishment of a colder climate, around the glacier, the current feedback reverts hot, cold.

The conditions described are interrelated and should generate a feedback process to steady cold glacier.

Following the water year, you begin to paint in the month of May to finalize before the rainy season in November.

To mitigate the emission of thermal radiation from rock surfaces and cool weather in the area glacier, the first snow cover not only the existing glacier but also much of the painted area, in these places the snow began to disappear by the rapid deterioration its albedo, but will melt the paint surface with high albedo that avoided the glacier perimeter heating and consequent ill effects.

During the wet season the glacier will grow in size covering the painted areas, as was shown in previous experiments.

Come the end of this period (April), before it was painted, the melting snow of the glacier perimeter surfaces appear dark, causing the release of large amounts of thermal radiation that generated the most intense fusion of the year, with the surfaces painted mitigates this great melting.

During the dry winter months of May to October, the low night temperatures and low heat absorption painted surfaces produce condensation in the form of frost, that melting during the day provide a significant flow to the basin, much appreciated during the dry season.

Conclusion:

The scientific community, estimated that by 2020, the glaciers that lie below 5000 meters, will be gone. Glaciers water reservoirs not only provide water, but also electricity, so the challenge for policymakers will be increasingly linked to current Environment and Climate Change.

In this context, the NGO Glaciers of Peru, won the award in the "Thousand Ideas to Save the Planet" organized by the World Bank. The proposal of the NGO was to paint white slopes of the mountains of glaciers, because the dark color then absorbs heat snowmelt and glacial melt faster. By placing a white base, the rock does not absorb the heat and the ice lasts.

Implementing a colder climate around mitigates the accelerated glacial.

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ANNEX I

JURISPRUDENCE

REPUBLIC OF ARGENTINA

CASE: District Ituzaingó c / Government of the Province of Córdoba.
DATE: Year 2008
PLACE: Neighborhood Ituzaingó Córdoba Province.
COURT: Chamber 1 of the Crime

BACKGROUND AND CONTEXT

In 2008, on rural Ituzaingó Quarter of Cordoba Province, was used in the spraying endosulfan and glyphosate in violation of Córdoba Agrochemicals Act No. 9164, which prohibits the application area of these products within 1500 less 500 meters away from urban populations respectively.

The case was elevated to trial after finding that the area was contaminated with a cocktail of arsenic, PCB transformers Provincial Power Company of Córdoba. In the Neighborhood Ituzaingó, were reported 200 cases of cancer, 100 of them fatal, and a sample of 142 children found that 114 have chemicals in your body.

The judgment of the Court dated August 21, 2012, sentenced to three years in prison for conditional execution to agricultural producers and Gabirelli Parra, while the pilot aeroaplicador Pancello, was disqualified for eight years in the exercise of the activity of agrochemical applications . I n both cases was applied PROBATION, celebrating ten hours a week of unpaid work in public welfare organizations linked to health.

FEDERAL REPUBLIC OF BRAZIL

CASE: Belo Monte Hydroelectric Plant

DATE: November 9, 2010

PLACE: Altamira, Pará

COURT: Branch of the Federal Court in Altamira (Pará)

CASE BACKGROUND AND CONTEXT

During the process of granting environmental licenses Belo Monte Power Plant conducted public hearings in 4 of the 9 municipalities affected by the implementation of the Usina to inform local people about entrepreneurship, risks, and benefits cuestos. The federal environmental prosecutor (Ministerio Público Federal) joined with a public civil action in questioning the effectiveness of civil society participation in the licensing. The Belo Monte Hydroelectric Plant is a project that dates back to 1970 and whose studies have been taken up in recent years, with a new location and adequacy of the technologies to decrease environmental impact. The process of granting environmental licenses in charge of IBAMA and were made long

hearings in four major towns that will be affected (with risks and benefits) by the plant. For hearings were citizens living in other municipalities neighbors will also also struck by the plant. The ruling affected the schedule for completion of the initial licensure and involved in a interference in management decisions about the evaluation requirements procedure. Subsequently, the decision was reviewed by the Federal Court which was positioned in the sense that the audience already reached made the attempt to promote the participation of civil society. The question the prosecution showed recurrent theme of environmental licensing and administrative decisions taken in the process of environmental licensing

CASE: Administrative Limitations in Atlantic

DATE: November 25, 2009

LOCATION: Brasilia, Brazil

COURT: Superior Court of Justice

CASE BACKGROUND AND CONTEXT

The Atlantic Forest biome is located in the most economically developed region in Brazil and was, therefore, too affected. Many companies bought large areas with claim desmate and exploration. However, 1993 was published a Federal Decree prohibiting exploration and removal of vegetation on properties inserted in the Biome. Companies admitted to trying lawsuits seek compensation with the argument that the ban meant an indirect expropriation. The decision was contrary to the claim of the owners and signed the understanding that these use limitations are not a form of indirect expropriation but only administrative constraints to be no compensation. He stressed that the limitations of Federal Decree 750, 1993, did not matter in full inexploración property as referred to only some species of forest cover (vegetation primary or middle and advanced degrees regeneration). There was also the pose of the areas by the Union nor its public destination, so it is necessary to characterize the expropriation. The decision is a milestone in the advance of the concept of environmental constraints, as used and needed in Brazil, and limitations of use that is not subject to compensation.

REPUBLIC OF CHILE

CASE: Palmar-Correntoso

DATE: October 3, 2008 (Court of Puerto Montt) and January 8, 2008 (Court Supreme)

Location: Puerto Montt, Santiago

COURT: Court of Appeals of Puerto Montt, confirmed by Supreme Court

CASE BACKGROUND AND CONTEXT

The "Mini run-of-Correntoso Palmar" involves the construction and operation of a hydroelectric plant in passing (13 MW) in Puyehue, Lakes Region, whose works of intake and part of the water pipelines are located in Puyehue National Park (1941). The project was submitted to the System of Environmental Impact Assessment was approved by the Regional Environmental Commission of the Lakes Region, in July 2008. A group of lawmakers filed an injunction (amparo proceedings of constitutional guarantees) against the decision, which it considered illegal, on the grounds that, by authorizing the execution of this project in a national park, you are changing the destination of this area protected by an administrative act.

The rulings of the Court of Puerto Montt and the Supreme Court made the distinction between national park tourism (governed by the Forest Act of 1931) and National Park (where applicable statute of the Washington Convention, in force in Chile since 1967) . The Supreme Court stated that there is no impediment for projects in national parks and other protected areas, to the extent that environmental approval is preceded by a rigorous assessment and only under certain conditions and requirements "in defense of the rational use of natural resources "adding that" we must ensure that activities are consistent with the objectives of preserving these spaces. "

REPUBLIC OF PERU

CASE: Action compliance with social and environmental obligations of DOE RUN PERU mining company for air pollution in the city of La Oroya.

DATE: 2002 – 2006

LOCATION: Lima

COURT: Constitutional Court

CASE BACKGROUND AND CONTEXT

In 1922 the American company Cerro de Pasco Copper Corporation began operations in Peru with center metallurgical activities the city of La Oroya, in the Department of Junin, in the central highlands of the country. Since then, La Oroya mining has metallurgical their main livelihood, and parallel the population and the environment have agonized progressively by air pollution derived emissions of lead and other heavy metals like arsenic, cadmium and antimony, with adverse effects on the health of children and adults. The company was expropriated in 1974 by the Peruvian and changes its name to CENTROMIN PERU. In 1996, PERU CENTROMIN pending before the Ministry of Energy and Mines-MEM Plan-Environmental Management and PAMA. PAMA derive a set of commitments, for example, that in a time span of 10 years of productive activity must conform to environmental standards in the country. In 1997, the Peruvian PERU CENTROMIN sold to the U.S. company Doe Run Company. DOE RUN filed before the Peruvian State to three times the aforementioned modification of PAMA and requests an extension of five years (until 2007) to meet the commitments arising. Illegally, in 2009, has become the term extended by 03 years. The Constitutional Court found the state responsible for failing to take preventive actions, and found an aggravating proven negligence (let do know the seriousness of the situation). The company also made efforts DOE RUN insufficient to improve the health of the population (high levels of lead in the blood). Not only ordered take-no preventive measures implemented promptly, but gave victims the right to raise a claim for strict liability, pursuing compensation and compensation for damage to the environment and health of the Constitutional Court's ruling was important because from defending the constitutional right to enjoy a healthy and suitable for the development of life, raised a significant counter to the Peruvian and the Doe Run Peru (and by extension the rest of mining and metallurgical companies , non-metallic mining, hydrocarbon and energy that had been operating in the country) regarding compliance with environmental

commitments arising from the management tools provided by law. In the case of PAMA, the main goal was to adapt the productive activities that had been developing prior to the effectiveness of environmental protection legislation energy and mining sector, enacted between 1993 and 1997. The PAMA made sense in a given period of time, since the State could not require environmental impact studies or environmental certifications extend background productive activities and generate significant negative environmental impacts. Currently the country no more the PAMA.

CASE: Writ of Amparo against Occidental Petroleum companies in Peru, Repsol and Petrobras for threatening the constitutional rights to enjoy a balanced environment suitable for the development of life, among others, in addition to compromising the Natural Protected Area "Cordillera Escalera".

DATE: 2007

LOCATION: Lima

COURT: Constitutional Court

CASE BACKGROUND AND CONTEXT:

On October 13, 2006 Mr. Jaime Bustamante Hans Johnson gets request for defense against Occidental Petroleum companies in Peru, Repsol and Petrobras for threatening the constitutional rights to enjoy a balanced environment suitable for the development of life, among others, and compromise the protected natural area "Cordillera Escalera". Oil exploitation means that millions of liters of water with high salinity oil production is extracted from underground and come to the surface and devastating polluting the environment. The exploitation of natural resources in protected areas can only be authorized in Peru if it is consistent with the category assigned zoning and Master Plan. The Ministry of Energy and Mines said it had not violated the Constitution as approved an Environmental Impact Assessment for Seismic Exploration Project. However, the EIA did not have a favorable opinion-legally required, the then National Institute of Natural Resources-INRENA or Regional Government of San Martin, then finally "Cordillera

Ladder "was a Regional Conservation Area. The companies answered the complaint requesting disallow and unfounded. The main basis is that the license or concession was granted before the creation of the Regional Conservation Area. **Therefore**

rights of exploration and exploitation should not be subject to the new condition of area.

In its ruling, the Constitutional Court concluded that the Regional Protected Area "Cordillera Escalera" was not only an area relevant to the San Martin region but for the entire country, while important source of water, which facilitated the capture of carbon and presented great biodiversity. In that sense, the Peruvian government should not weigh the exploration and exploitation of hydrocarbons over the conservation of natural resources and environmental elements that relate to the biosphere and the technosphere. The exploration and exploitation activities should be suspended until the ANPR "Cordillera Escalera" does not have such a Master Plan.

Finally, the Court encouraged the consensus between indigenous communities and the companies involved, from social responsibility principles and criteria remuneration.

The aforesaid judgment would-yet-progressive and slow assimilation of their scope, since the preference of strategic conservation systems above the legal security of investments, could create uncertainty and inefficiency of the concession contracts and real rights supervening.

REPUBLIC OF URUGUAY

CASE: Attorney General, Office of Civil Legal 3rd Shift c / MVOTMA AND OTHER

DATE: Date of First Instance judgment of 03.11.2009

LOCATION: Central

COURT: Counsel Court of First Instance of 12 Civil Shift

CASE BACKGROUND AND CONTEXT

In the case, which is under appeal is being processed discussion of the scope of the environmental principles above, forecasting, prevention. Also under discussion is the realization of transgenic crop plantations the country has already authorized in the past, a fact for which planting is now legal in the country. At issue is the different skills that are public bodies in the country since the environmental agency has no jurisdiction to control and prevent transgenic cultivated today is not necessary to seek permission to carry out a plantation of one hectare of GM maize for example.

CASE: Prosecutor 3rd. Shift / MVOTMA

DATE: 05/30/2007 sentencing

PLACE: Refers to an activity carred out in the Department of Paysandu.

COURT: Counsel in Civil Court 17 Shift.

CASE BACKGROUND AND CONTEXT

The plaintiff, the prosecution calls for preventive or precautionary action for damages, which are brought to the State's responsibility for failing to undertake functional, is imposed observance thereof. The prosecution requested the suspension of the authorization of an industrial waste dump of a company of a tannery. Authorization was made by a ministerial authorization made after the process of Environmental Impact Assessment which sets national rules.

One of the main aspects considered in the case is the possibility that through the courts is an administrative change, it is recalled that in Uruguay there Contentious Administrative Court, requesting body before whom the action for annulment of administrative acts of state bodies, after serving recursive step. The decision is also important because it discusses the EIA process by the state and the role of justice in civil proceedings. The judgment expressly provides that when there is an administrative act, not for the judiciary to annul the act because it is not for violating legal certainty. It argues that it is very

questionable whether the prosecution can exercise pretext claim judicially diffuse interests disengagement or enervation of an administrative act, when it needed to invoke a direct, personal and legitimate.

ANALYSIS OF CASE LAW

REPUBLIC OF ARGENTINA

Neighborhood Ituzaingó Córdoba Province

The Tribunal of the House I Crime, focused his discussion on the violation of the Agrochemicals Act No. Córdoba 9614, by Don glyphosate and endosulfan spraying in urban areas Ituzaingó Quarter of Córdoba Province. The Court confined the effect erga WHO's decision-making in a case of undoubted collective dimension, affecting man's right to enjoy a healthy and balanced environment, as enshrined in the Constitution. The ruling is the first pronouncement of a court suit that responds to environmental law.

FEDERAL REPUBLIC OF BRAZIL

Altamira plant of Belo Monte

The Sectional Court of the Federal Court in Altamira, was positioned in the sense that hearings held reached attempt to promote the participation of civil society. The question the prosecution showed recurrent theme of environmental lincenciamiento and decisions made in the process of environmental licensing, adapting to a new location and technologies to reduce the environmental impact. The Court put the precautionary principle of relevance.

Administrative Limitations in Atlantic

The High Court of Justice, raised in the statement, disapproval and indirect compensation. The question showed that companies had joined lawsuits trying to get compensation from the Federal Decree prohibiting exploitation and removal of vegetation in the area, claiming that the ban meant an indirect expropriation.

The Court's decision was contrary to the claim of the owners of the companies, arguing that the limitations imposed by the Federal Decree does not constitute a form of disapproval but only indirect administrative constraints to which there is no compensation.

REPUBLIC OF CHILE

Palmar Correntoso

The Court of Appeals of Puerto Montt confirmed by the Supreme Court, focused his discussion on the claim filed by a group of members consisting of an action for protection of constitutional guarantees, due to authorize a project in a national park. The rulings of the Court of Appeals of Puerto Montt and the Supreme Court, made the distinction between National Park and National Park tourism, both governed by different rules. The Court did not endorse the claim filed, considering no bar to produce works in this protected area, to the extent that this authorization preceded by a rigorous assessment and certain conditions and requirements in defense of rational use of natural resources. The Court put the precautionary principle of relevance.

REPUBLIC OF PERU

Doe Run Peru Mining Company

The Constitutional Court ruling was important because from the defense of the constitutional right to enjoy a healthy and suitable for the development of life, raised a significant counter to the Peruvian and the Doe Run Peru (and addition to other mining and metallurgical companies, non-metallic mining, hydrocarbon and energy that had been operating in the country) regarding compliance with environmental commitments stemming from the instruments management provided by law. In the case of PAMA, the main goal was to adapt the productive activities that had been developing prior to the effectiveness of environmental protection legislation energy and mining sector, enacted between 1993 and 1997. The PAMA made sense in a given period of time, since the State could not require environmental impact studies or environmental certifications extend background productive activities and generate significant negative environmental impacts. Currently the country no more the PAMA.

The Court made relevant the Precautionary Principle, the Principle of Conservation and Sustainable Development.

Amparo action against Occidental Petroleum companies in Peru, Repsol and Petrobras for threatening the constitutional rights to enjoy a balanced environment suitable for the development of life, among others, in addition to compromising the Natural Protected Area "Cordillera Escalera”

In its ruling, the Constitutional Court concluded that the Regional Protected Area "Cordillera Escalera" was not only an area relevant to the San Martin region but for the entire country, while important source of water, which facilitated the capture of carbon and presented great biodiversity. In that sense, the Peruvian government should not weigh the exploration and exploitation of hydrocarbons over the conservation of natural resources and environmental elements that relate to the biosphere and the technosphere. The exploration and exploitation activities should be suspended until the ANPR "Cordillera Escalera" does not have such a Master Plan.

Finally, the Court encouraged the consensus between indigenous communities and the companies involved, from social responsibility principles and criteria remuneration.

The aforesaid judgment would-yet-progressive and slow assimilation of their scope, since the preference of strategic conservation systems above the legal security of investments, could create uncertainty and inefficiency of the concession contracts and real rights supervening. The Court emphasized the precautionary principle, the polluter pays principle and the principle of intergenerational equity.

REPUBLIC OF URUGUAY

Attorney General, Office of Civil Legal 3rd Shift c / MVOTMA

AND OTHERS

Counsel Court of First Instance of 12 Civil Shift

In the case, which is under appeal is being processed discussion of the scope of the environmental principles forecasting, prevention. Also under discussion is the realization of transgenic crop plantations the country has already authorized in the past, a fact for which planting is now legal in the country. At issue is the different skills that are public bodies in the country since the environmental agency has no jurisdiction to control and prevent transgenic cultivated today is not necessary to seek permission to carry out a plantation of one hectare of GM maize .

The Court emphasized the Precautionary Principle.

Prosecution 3rd. Shift / MVOTMA

Counsel in Civil Court 17 Shift

The ruling is important because it discusses the EIA process by the state and the role of justice in civil proceedings. The judgment expressly provides that when there is an administrative act, not for the judiciary to annul the act because it is not for violating legal certainty. It argues that it is very questionable whether the prosecution can exercise pretext claim judicially diffuse interests disengagement or enervation of an administrative act, when it needed to invoke a direct, personal and legitimate. The Court underscores the importance Precautionary Principle

GENERAL CONCLUSION

The assessment of climate science from the Intergovernmental Panel on Climate Change, supports the theory that most of the warming observed over the last 50 years is attributable to human activities.

The Mercosur region, is no stranger to this pose and therefore each member country, is facing the challenge of building a Mercosur with the duty to see global warming by adopting appropriate policies.

In this research team member country individually has developed a theme related to the Environment, Climate Change and the Insurance Law, linking specific jurisprudence. Chapter I, develops the theme of the phenomenon of drought in Argentina in the last quarter of 2011 and early 2012.

Faced with this scourge, the mapping information and network standards capture terrestrial weather data are a useful tool to determine in advance the climate risk assessment. With regard to agricultural producers, given that the region has a low insurance coverage, must safeguard the sustainability and food security, taking agricultural insurance coverage for the activity.

For this reason the Ministry of Agriculture, Livestock and Fisheries intends to develop an instrument of transfer which would cover the deficit that affects production causing extreme events such as drought event, based on the use of remote sensors. Together the World Bank will provide technical assistance for actuarial computations and various regulatory, operational and technical resources to implement this type of insurance.

In Chapter II, the Federal Republic of Brazil, developed an extensive report in which the most important issues relating to the carbon market, the Clean Mechanism projects and their relationship with the Brazilian insurance market.

In Brazil there in the insurance market specific products relating to the Clean Development Mechanism. However, in the field of insurance there are great prospects for growth in

renewable energy, no recorded for products that protect these risks.
The demands on the insurance market are related to the political and economic measures relating to emissions of greenhouse gases, the future of this market depends on the outcome of the resolutions adopted by countries to reduce greenhouse gases despite the difficulties. Nevertheless, pressure from civil society and the private sectors demand the government take action to reduce emissions of greenhouse gases.

In Chapter III, the Republic of Chile, developed the theme of environmental pollution in the city of Santiago de Chile, one of Latin America's most polluted. In the research report, the solutions to the problem of smog, are essentially sustainable, through programs and high stringency standards, encouraging innovation will mainly cities and polluters.
On the other hand with respect to the action of the Environment, the Law on General Environment, environmental issues will largely regulated based on the precautionary principle. Nevertheless, Chilean law does not include the requirement of insurance covering civil liability for environmental damage, there are only insurance which cover such damage to voluntary membership.

In Chapter IV, the Oriental Republic of Uruguay, has developed a research on Municipal Solid Waste.

Since the 80s, began in Uruguay, a process of reflection on the themes related to the environment, health and development. The Environmental Protection Act, declares the interest of protecting the environment against any impairment that may result from the handling and disposal of waste. Nevertheless, there are open dumps that cause environmental impact, as well as the informal gathering.
Regarding industrial solid waste generators not prioritize the reduction, recycling and energy recovery, most of the service industries operate the criterion of minimum cost to manage them.

Regarding solid waste have contaminated hospital treatment appropriate to current standards.

The solutions according to the analysis of the report, it should prioritize recycling, reduction and energy recovery.

In Chapter V, The Republic of Peru developed the theme of tropical glacier retreat. Given that Peru has the largest number of world's tropical glaciers, the rulers of the region, face a difficult problem because the glaciers not only provide water but also electricity. An NGO launched a mitigation proposal that involves painting the sides of the white glaciers for rock does not absorb the heat and ice last.

To mitigate the emission of thermal radiation from rock surfaces and cool weather in the area glacier, the first snow cover not only the existing glacier but also much of the painted area, in these places the snow began to disappear by the rapid deterioration its albedo, but will melt the paint surface with high albedo that avoided the glacier perimeter heating and consequent ill effects.

Moreover, it is important to note that the jurisprudence of the courts of the member countries of Mercosur brings relevance in most of his pronouncements the Precautionary Principle.

GLOSSARY

A

AIR POLLUTION: Air pollution means the presence in the atmosphere of substances in a quantity that involves discomfort or risk to the health of humans and other living things.

ALBEDO: Percentage of light or electromagnetic radiation reflecting surface.

AFFORESTATION: is designated by the term afforestation activity that is devoted to study, promote and manage the practice of plantations, especially forests.

AMM: Metropolitan Montevideo.

AMMONIA: is a chemical compound whose molecule is a nitrogen atom (N) and three hydrogen atoms (H) according to the formula NH3.

ATMOSPHERE: The atmosphere is the layer of gas surrounding a celestial body that has enough mass to attract the gas. The gases are attracted by the gravity of the body and remain in it if gravity is sufficient and the temperature of the atmosphere is low.

C

CARBON DIOXIDE: Carbon dioxide (CO2) is a colorless, dense unreactive. Form part of the composition of the troposphere (atmospheric layer closest to the earth) currently in a proportion of 350 ppm. (Parts per million). Your cycle in nature is linked to oxygen. **CCS**: carbon capture and storage (CCS), (carbon capture and sequestration), refers to technology to try to prevent the release of large amounts of CO 2 into the atmosphere by burning fossil fuels in power generation and other industries using the CO 2 capture, transport and ultimately pumped into underground geological formations to store it safely away from the

CER: The carbon credits or certified emission reduction (CER) certificates are issued to a person or company that has reduced its emissions of greenhouse gases (GHG). atmosphere

CLIMATE CHANGE: It's called climate change climate modification regarding climate history to a global or regional scale. Such changes occur at very different time scales and on all meteorological parameters: temperature, air pressure, precipitation, cloudiness. **CETESB:** Company of Environmental Sanitation Technology. Federative Republic of Brazil.

CLIMATOLOGY: CLIMATOLOGY: is the science or branch of Earth science that deals with the study of climate and its variations over chronological time.

CHLORINE: Chlorine is a chemical element with atomic number 17 located in the group of halogens (Group VIIA) of the periodic table of the elements. Its symbol is Cl in normal conditions and in pure form dichloro-a greenish-yellow poisonous gas formed by diatomic molecules (Cl2) about 2.5 times heavier than air, foul-smelling and toxic. It is an abundant element in nature and it is a chemical element essential to many life forms. **CHLOROPHYLL:** Chlorophyll is an extremely important biomolecule, critical in photosynthesis, the process that allows plants to absorb energy from light.

COMMODITIES: Merchandise (English, commodity) economy is in any product intended for commercial use. Speaking of merchandise, generally emphasizes generic, basic and without much differentiation between varieties.

COMMON HOSPITAL solid waste: is he that is not of sanitary waste or potentially might takeany of the characteristics in the above definition.

contact with air and moisture, becomes sulfur trioxide. The speed of this reaction is low under normal conditions.

COMPOSTING: Composting is a process of transformation of organic matter for compost, a natural fertilizer.

COMPREHENSIVE INSURANCE: It is one for which a single contract guaranteeing the major risks to which they are subject hedged assets.

CONAE: National Commission on Space Activities. Argentina.

CONAMA :National Environment Commission. Republic of Chile.

CONTAMINATED HOSPITAL SOLID WASTE: considers all sanitary waste which present or may present characteristics potentially infectious, corrosive, reactive, toxic, explosive, flammable, irritant, cutting, stitching and / or radioactive and can therefore pose a risk to the health or the environment.

COP: COP serving as the meeting of the Parties to the Kyoto Protocol (CMP) is the supreme body of the instrument.

COTAMA: Technical Advisory Committee of Environmental Protection. Oriental Republic of Uruguay.

CROP INSURANCE: Coverage System that protects against certain risks, especially weather, most important agricultural crops in a region.

Environmental Security: The environmental insurance can be defined as one that is intended to cover the costs for environmental damage.

CRYOSPHERE: Cryosphere, Cryo derived from Greek word meaning "cold" or "cool" is the term that describes parts of the Earth's surface where water is in solid form, including sea ice, the lake ice, river ice, glaciers and ice sheets and frozen ground.

D

DEFORESTATION: Deforestation is a process generally caused by human action, in which the surface is destroyed forestal.2 3 is directly caused by the action of man over nature.

DEGLACIATION: deglaciation is called the melting of glaciers. Retreating glaciers.

DEGRADATION: Action degrade or lose a quality or characteristic state: the degradation of natural environment is the quality of this loss, usually due to human action.

DIFFUSED RIGHTS: The rights diffuse are those which are not directed to a particular person as the holder thereof, but an indefinite number of people.

DESERTIFICATION: is a process of environmental degradation in the soil fertile and productive lose all or part of the production potential. Can usually be traced to a local failure, causing serious subsequently usually caused by the spread of that. The mass, once

produced the rupture can slide at a variable distance, overlapping with the natural terrain and setting it a well-defined separation surface.

E

ECOLOGICAL DAMAGE: Environmental damage is any act, omission, conduct or act exercised by an individual physical or legal, public or private, to alter, impair, disrupt, diminish or threaten imminent and significant, some element of the environment concept, breaking with it own natural balance of ecosystems.

ELECTROMAGNETIC FIELD: A field electromagnetic field is a physical tensor type, those produced by electrically energized elements, which affects charged particles Electromagnetic Field: A field electromagnetic field is a physical tensor type, those produced by electrically energized elements, which affects charged particles

ENVIRONMENTAL DAMAGE: environmental damage means the effect of a certain action on the environment in its various aspects. The concept can be applied with little utility for the purposes of a natural catastrophic. Technically, is the alteration of the base line, due to human action or to natural events.

ENVIRONMENTAL RESPONSIBILITY: Environmental responsibility is the attribution of a positive or negative ecological impact of a decision. Generally refers to damage to other species, to nature as a whole or future generations, for the actions or non-actions of another individual or group.

ENVIRONMENTAL SECURITY: The environmental insurance can be defined as one that is intended to cover the costs for environmental damage.

ENVIRONMENTAL EDUCATION: Teaching is a mechanism that also infuses the interaction within ecosystems.

EFFLUENTS: A term used to designate wastewater with solid, liquid or gas that are emitted from homes and / or industries, usually water courses, or who enter these fields by runoff caused by rainfall.

INDUSTRIAL EFFLUENT should be considered as such, all wastewater discharges resulting from industrial processes, as well as discharges caused by various industrial water

uses, such as those from the purges closed or semi-closed circuit cooling, production steam recirculation of process water, condensate water, cleaning of equipment and utensils. **EIA:** Environmental Impact Assessment. Republic of Chile.

ELECTROMECHANICAL ENERGY: Electro Energy is the academic discipline that deals with the combination of the sciences of electromagnetism of electrical engineering science and mechanics.

ENSO: is an oceanic-atmospheric phenomenon that involves the interaction of surface water tropical Pacific Ocean with the surrounding atmosphere. In addition, ENSO is related to climatic conditions in many parts of the world as well as significant changes in various types of terrestrial and marine ecosystems.

ENVIRONMENTAL AUDIT: Environmental auditing is a methodological process aiming at the systematic, documented, periodic and objective evaluation of productive activities to detect their position in relation to the requirements or accepted standards of environmental quality

ERU: Unit ERU Emission Reduction is a bargaining unit under the Kyoto Protocol, a reduction of greenhouse gases under the joint implementation mechanisms which represents one tonne of CO2 equivalent reduced.

F

FOOTPRINT: The footprint is an indicator of the environmental impact caused by human demand being made of existing resources in the planet's ecosystems by relating it to the Earth's ecological capacity to regenerate its resources. Represents the area of ecologically productive land or water (crops, pastures, forests and aquatic ecosystems) (and ideally also the volume of air) necessary to generate the necessary resources and also to assimilate the waste produced by each given population according to their lifestyle, indefinitely. The measurement can be done at very different scales: individual (the ecological footprint of a person), populations (the ecological footprint of a city, a region, a country, ...), communities (the ecological footprint of agricultural societies , industrialized societies).

The fundamental objective of calculating the ecological footprint is to assess the impact on the planet in a certain way or way of life and, compared with the planet's biocapacity

G

GEF: Global Environment. Oriental Republic of Uruguay

GEOSPATIAL: Geospatial is designated as, objects or entities abstracted from the actual geographic space, may correspond to the elements of nature, with elements of product man-numeric abstractions or less from treatment of figures related to those objects or entities . Its characteristic is the sine qua non spatial reference in 2 or 3 dimensions.

GLACIOLOGY: Glaciology is the branch of science or earth science, concerned with the many current and past events relating to the extent, distribution, causes, characteristics, processes, dynamics, classifications and implications of solid water in all events that can occur in nature (glaciers, ice, snow, hail, firn.

GLOBAL WARMING: Global warming is a term used to refer to the phenomenon of the increase in global average temperature of Earth's atmosphere and oceans.

GRANODIORITE: This is a rock Philonian (cooled to an intermediate depth), and therefore, with a location not as big as the plutonic granites and granodiorites.

GREEN CHEMISTRY: Sustainable Chemistry (also called green chemistry) is a chemical philosophy directed towards the design of chemical products and processes involving the reduction or elimination of hazardous chemicals (for materials, people and the environment).

GREENHOUSE: greenhouse is called the phenomenon by which certain gases, which are components of the planetary atmosphere, retain part of the energy emitted by the planetary surface has been heated by stellar radiation. Affects all equipped rocky planetary bodies atmosphere. This phenomenon keeps the received energy back to space constantly producing an effect on a global scale similar to that observed in a greenhouse. In the solar system, the planets have greenhouse are Venus, Earth and Mars.

GROUNDWATER: Groundwater is formed from the infiltration of rainfall and surface courses contributions.

H

HAZARDOUS WASTE: all known hazardous waste disposal (substance or object) in any physical state of aggregation that has an inherent capacity to cause adverse effects, direct or indirect, on health or the environment.

HOSPITAL SOLID WASTE: Are wastes arising from the use of medicine, also known as clinical waste. Typically refers to waste products can not generally considered waste produced from the premises snitaria attention, such as hospitals.

HURRICANE: Hurricane is called the air mass movements that are strong in the air and often cause winds with speeds exceeding 100 km / hour. Although often become highly destructive hurricanes are an important part of the system of atmospheric circulation causing heat stroke.

HYDROGEOLOGY: Hydrogeology is the science that studies the origin and formation of groundwater reservoir forms, diffusion, motion, and reservations system, its interaction with soils and rocks, its state (liquid, solid and gas) and properties (physical, chemical, biological and radioactive), and the conditions that determine the measures of its use, and disposal regulations.

HYDROLOGY: Hydrology is called (Greek Υδωρ (hydro): water, and Λογος (logos): study) science or branch of Earth Sciences that is dedicated to the study of the distribution in space and time, and the properties water in the atmosphere and in the Earth's crust. This includes rainfall, runoff, soil moisture, evapotranspiration and glacier mass balance.

HYDROLOGICAL DROUGHT: Refers to a deficiency in the flow or volume of surface water or groundwater

HOUSEHOLD WASTE: waste are generated in households or communities. They are generally solid.

I

IBAMA: Brazilian Institute of Environment and Renewable Natural Resources

INDUSTRIAL ECOLOGY: Industrial ecology is an innovative practice environmental management considering the industrial system as an ecosystem.

ISER: Institute for the Study of Religion. Federative Republic of Brazil. Ichthyofauna: ichthyofauna is called the set of fish species that exist in a particular biogeographic region.

ISO 14001-2004: verifies compliance of the environmental management

L

LANDFILL: Site where or where it is dumped garbage, debris, waste or water

LANDSLIDE: These movements are produced by a variety of causes. To overcome the shear strength of a material over an area of weakness or over a narrow band less resistant material than the rest.

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

LGPA: General Law of Environmental Protection.

LIQUEFIED GAS: Liquefied gas means, that gas or mixture of gases having a critical temperature greater than or equal to -10 ° C.

WMO: World Health Organization.

M

MEDICAL WASTE: It's called medical waste generated in the health facilities. **MEI:** Multivariate ENSO Index

METEOROLOGICAL DROUGHT: meteorological drought is called, to the expression of the deviation from the mean rainfall over a period of time, based on climate data

MICROBIOLOGICAL CONTAMINANTS live and breed in microclimates often as wet basements.

MITIGATION: Mitigation is called the set of measures that can be taken to counter or minimize the negative environmental impacts that may have some human actions. These measures should be consolidated in a mitigation plan, which must be part of the environmental impact study.

MODIS: Moderate-Resolution Imaging Spectroradiometer (MODIS) is a scientific instrument launched into Earth orbit by NASA in 1999 on board the Terra satellite (EOS AM) and in 2002 aboard the Aqua satellite.

MVOTMA: Ministry of Housing, Spatial Planning and the Environment. Oriental Republic of Uruguay.

N

NAZCA PLATE: The Nazca plate is an oceanic tectonic plate that lies in the eastern Pacific Ocean, near the western coast of South America, more specifically in charge of the countries of Chile, Peru, Ecuador and part of Colombia

NEUTRALISATION CARBON: The neutralization of carbon is a natural process that occurs in the oceans and forests, through photosynthesis, Carbon capture and release oxygen into the atmosphere. With the capture and storage of CO^{2}, avoided that the accumulated gas is left in the terrestrial atmosphere causing overheating, caused by the greenhouse effect.

NF3: Nitrogen trifluoride is the inorganic compound with the formula of NF3. This nitrogen-fluorine compound is a colorless, toxic, flammable and odorless. Is used, with increasing frequency, as a recorder in microelectronics.

NITROGEN DIOXIDE: Nitrogen dioxide or nitric oxide (NO2), is a chemical compound consisting of the elements nitrogen and oxygen, one of the main contaminants between the various oxides of nitrogen. Nitrogen dioxide is yellowish-brown. Is formed as a byproduct in the process of combustion at high temperatures, such as in motor vehicles and power plants. So it is a common contaminant in urban areas.

NITROGEN TRIFLUORIDE: Nitrogen trifluoride is the inorganic compound with the formula of NF3. This nitrogen-fluorine compound is a colorless, toxic, flammable and odorless. Is used, with increasing frequency, as a recorder in microelectronics

Noise Pollution: It's called noise (or noise pollution) to excessive sound that disrupts normal ambient conditions in a given area.

O

OROGENIC: orogenic movement is called, to the formation or rejuvenation of mountains and ridges caused by compressive deformation of more or less extensive regions of continental lithosphere. Cortical thickening occurs and the materials undergo various character compressive tectonic deformations, including folding, faulting and shifting of garments.

OZONE O3: Ozone (O3) is a substance whose molecule consists of three oxygen atoms, formed to dissociate the two atoms that compose the oxygen gas. Each atom of oxygen released binds to another molecule of oxygen (O2) to form ozone molecules (O3). At ambient temperature and pressure ozone is a pungent gas and usually colorless, but in high concentrations can become slightly bluish. If you breathe in large amounts, can cause eye irritation and / or throat, which usually happens after some fresh air for a few minutes.

P

PARAMETRIC INSURANCE: insurance parametric adopt financial strategies allow the management and catastrophic risk transfer; deal more effectively the economic and social consequences generated by adverse weather conditions, and reduce pressure on public finances generated by emergency support to the occurrence of such events. **PDSI:** The Drought Severity Index Palmer, is the most widely used method quantifier internationally. It was developed to measure the intensity, duration and spatial extent of drought. PDSI values derived from measurements of precipitation, air temperature and soil moisture together with previous values of these measures. This drought index has been used to assess the impact of drought on agriculture. The PDSI, is all precipitation like rain,

so that this index is not useful in the high latitudes, particularly in winter when most m

PHYSIOGRAPHY: The science is description of the physical characteristics of the Earth and of phenomena of nature which it originated.

PERIGLACIAL: In periglacial geomorphology the term refers to geomorphic processes created by the freezing of water into ice and the areas in which these processes operate. Today the term is used to associate periglacial landforms to freeze some water or a cold climate regime.

PM10: PM10 is called small solid or liquid particles of dust, ashes, soot, metal particles, pollen cement or dispersed in the atmosphere, and whose diameter is smaller than 10 microns (1 micron corresponds one-thousandth of a millimeter.

POES: Polar Environmental Satellite Operationel.

POLLUTION: Pollution is the introduction by anthropogenic causes certain substances or forms of energy that produce biological effects.

PPDA: Prevention and Decontamination Plan for the Metropolitan Region. Republic of Chile.

R

RECYCLING: Recycling is a physicochemical or mechanical process that involves subjecting a material or product used as a treatment cycle whole or in part for a raw material or a new product.

RADIOACTIVE WASTE : Radioactive waste is essentially characterized by the nature of the items they contain and their activity per unit mass or volume. They are characterized by particles or emit ionizing radiation.

S

SAC / C: The SAC-C is an Argentine artificial satellite Earth observation. Its mission is to monitor the environment and natural disasters. Countries associated with this mission are: United States, Italy, Denmark, France and Brazil.

SDF: Final Disposal Site. Eastern Republic of Uruguay.

SEIA: Environmental Impact Study. Republic of Chile.

SISNAMA: National Environmental System.

SMA: State System of Middle

SOCIO-ECONOMIC DROUGHT: Occurs when water availability decreases to the point of financial or personal damage to the population of the area affected by low rainfall.

SOIL POLLUTION: Soil contamination usually appears to result in breakage of underground storage tanks, application of pesticides, leaking landfills or direct accumulation of industrial products, which produces a decrease in the environment since soils are make infertile.

SOI: Oscillation Index.

SST: Temperature Sea Surface

SULFUR DIOXIDE: Sulfur dioxide is an oxide molecular formula SO2. It is a colorless gas with a suffocating odor characteristic. It is a reducing substance which, over time,

SUSTAINABLE DEVELOPMENT: Sustainable development is defined as: Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

T

THERMAL RADIATION: radiation is called thermal or heat radiation emitted by the body due to its temperature. All bodies emit electromagnetic radiation, with an intensity dependent upon temperature and the wavelength considered.

TRMM: The TRMM: Mission Tropical Rainfall Measuring (Tropical Rainfall Measuring Mission (TRMM) is a conjunction of space exploration between NASA and the Japan Aerospace Exploration Agency (JAXA) designed to monitor and study tropical rainfall and subtropical, between 35 º N and 35 ° S.

TROPICAL CYCLONE: A tropical cyclone is a meteorological term used to refer to a storm system characterized by a closed circulation around a center of low pressure and producing strong winds and heavy rain. Tropical cyclones derive their energy from the condensation of moist air, producing strong winds. They are distinguished from other

cyclonic storms such as polar lows by the heat mechanism that feeds the storm systems becomes "warm core". Depending on its location and strength, a tropical cyclone can be called tropical depression, tropical storm, hurricane, typhoon or simply cyclone.

TROPICAL GLACIERS: A tropical glacier is a glacier that is located between latitudes 30 degrees north and 30 degrees south. They are found in the Andes, but also for example in the mountains in Africa and in the southern part of the Himalayas.

TROPOSPHERE: the layer of the atmosphere that is in contact with the surface of the Earth Contains 3/4 parts of atmospheric air.

U

UN: United Nations.

UNEP: United Nations Environment.

Waste Management: Waste management, referring strictly to household waste, is the collection, transport, processing, treatment, recycling or disposal of waste material, usually produced by human activity.

UNESCO: United Nations Educational, Scientific and Cultural Organization.

W

WEATHER PHENOMENA: Those movements permanent processes and transformations that nature and that can influence human life.

WIND ENERGY: Wind energy is the energy from wind, ie, the kinetic energy generated by the effect of air currents, and is transmuted into other useful forms for human activities.