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GROUNDWATER AND GLOBAL CHANGE

Environmental Policies 2015/2016

Brazilian Environmental Policies and Issues

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“Only within the moment of time represented by the present century has one species -- man -- acquired significant power to alter the nature of the world.”

— Rachel Carson, Silent Spring
1. Introduction

Brazil is a country of continental proportions: its 8.5 million km² occupying nearly half of South America, covering various climatic zones that reflects a wide variety of animals, plants, microorganisms and ecosystems unique on the planet. Also has a marine coast of 3.5 million square kilometers, which includes ecosystems such as coral reefs, dunes, mangroves, lagoons, estuaries and marshes. The enormous wealth of flora and fauna categorizes the country with the largest biodiversity in the world.

The environmental policies are a set of rules, laws and public actions intended to preserve the environment within a territory. In Brazil, the movement to develop sustainable practices was first adopted in 1930s. The first government action in support of environmental preservation in the country was the creation of national parks. The parks were located at points where agricultural expansion along with the consequent deforestation processes occurred, such as the Parque Nacional de Itatiaia, the Parque de Iguaçu, and the Serra dos Órgãos Park. The first Brazilian Forest Code was originated to regulate the use of lands within the country in 1934.

Due to the intensification of the industry expansion in the country, in the middle of the century, the environmental issues were set aside and its progress began to stagnate. Since Brazil is one of the greatest biodiversity hotspots with high density of unique species, the stagnant progress is an issue for the entire world, not merely for the country.

Actions and measures were taken in the 1960s, with a goal in mind to achieve a better environmental sustainability, such as the creation of Permanent Protection Areas (APPs) surround the rivers, and the responsibility of farmers on the creation of forest reserves inside their lands. But only after the Stockholm Conference in 1972 and due to the pressure from ecofriendly groups, the government reentered with direct actions to improve the environmental policies in the country. The creation of the Special Secretariat of Environment (SEMA), whose orientation is the preservation and the maintenance of natural resources in the country, was the first major action of the government. Other agencies were created during the 1980s, such as the National Environmental System (SISNAMA), the National Environmental Council (CONAMA) and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), the agency responsible for environmental inspection.
The Federal Constitution was promulgated in 1988 and recognized as one of the most advanced environmental laws in the entire world. Such reference is due mainly to the fact that the laws cover both the duties of citizens and of companies, institutions and the government itself facing the environment conservation. Nevertheless, the criticism lies now on the inspection and on the application of such laws, once that many law-breaking against the environment still unpunished, particularly those committed by big companies.

Brazil was home of the four major milestones of Environmental Polices in the world. One was United Nations Conference on Environment and Development in 1992, popularly known as Rio-92 or Eco-92, that was the first time that authorities of the world talked about the precautionary principle and adopted a program of Action for Sustainable Development, Agenda 21, and also the Rio Declaration on Environment and Development. The other one was in 2012, The United Nations Conference on Sustainable Development, popularly known as Rio + 20, that was focused on two main themes: How to build a green economy to achieve sustainable development and lift people out of poverty, including support for developing countries that will allow them to find a green path for development; and how to improve international coordination for sustainable development.

In 2010, a New Forest Code was elaborated. According to many environmental researchers, that was a regression on the Brazilian legislation related to the environment. The main changes in the code were such as the reduction of the APP areas and the amnesty for environmental crimes committed by landowners.

The concern about quality of air and water, and the protection of the forests still under discussion in all over the country’s governments and environmental agencies, especially with the climate change subject in the aim of the scientific community.

2. Related Problems

In this section we present some of the environmental problems found in the Brazil by this time, such as the pollution and the bad conservation of water bodies and groundwater, deforestation problems, air pollution, and the lack of land use planning.
2.1 Water Issues

Brazil has one of the biggest hydrologic potential in the world, with approximately 12% of the total surface water of the Earth, Figure 1.

![Figure 1: Superficial water distribution in the world (Source: ANA, 2007)](image)

Due to its heterogenic distribution (Table 1) and bad-quality management-plans, several ecological and social problems are found within the country, such as droughts, floods and the pollution of water bodies, that last one specially in the southeast, where is established the industrial polo, as well as some of the crop fields of the country. The biggest part of the surface water is located on the north part of the country, especially in the Amazonia basin, where minor part of the population is located.

<table>
<thead>
<tr>
<th>Region</th>
<th>Resource (%)</th>
<th>Superficial (%)</th>
<th>Population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>68.50</td>
<td>45.30</td>
<td>6.98</td>
</tr>
<tr>
<td>Center and West</td>
<td>15.70</td>
<td>18.80</td>
<td>6.41</td>
</tr>
<tr>
<td>South</td>
<td>6.50</td>
<td>6.80</td>
<td>15.05</td>
</tr>
<tr>
<td>Southeast</td>
<td>6.00</td>
<td>10.8</td>
<td>42.65</td>
</tr>
<tr>
<td>Northwest</td>
<td>3.30</td>
<td>18.30</td>
<td>28.91</td>
</tr>
</tbody>
</table>

Droughts and flood are a historical concern in the country due to the seasonal variations; however they increased in the last years thanks to climate change and overexploitation of the reservoirs. A recent example of this issue is seen in the state of São Paulo as well as in the city of São Paulo.

The city of São Paulo has approximately 20 million habitants and the using of water in the city is mainly for urban needs (58%) and industrial uses (39%) (Source: FUSP, 2009).
During the last years, the water level of the Cantareira Reservoir, responsible for supply 8.8 million of the citizens, constant decreased (Figure 2). With precipitation ratios 60% lower than the historical average, the situation worsened in 2014. In sum, the measures taken by the government on that time of extreme weather was to reduce the exploitation of the reservoir, to start the catchment of dead storage two times (the volume of water that lies underneath the level of the pumps – what confirms how low was the level of water) and connected others supply systems to the Cantareira trying to contain the water crisis.

![Figure 2: The Cantareira reservoir level (in %) between 2013 and 2015 (Source: Sabesp).](image)

The expectation for the recovery of the system to its normal level is in the middle of 2016 (Source: SABESP). But with no long-term management plans, no infrastructure investments, and poor environmental education and poor conservation of spring areas, which generate the rivers that supply the reservoirs, the issue still without a real solution. The same happens in great part of the state and in some another places in the country.

While that, people have small or no access to potable water, as in northwest portion of the country. For that problematic, plans of transposing of rivers to take water to that places and investments in infrastructure are underway, but the projects still have long years ahead until be concluded due mainly to political issues and low-priority concerning the policy of water resources in the country.

The contamination of water bodies and groundwater is a recent but serious issue in the country, especially since the laws concerning about that are recent and the inspection of such a problem becomes hard in a country with the dimensions of Brazil.
Sewage leakages, incorrect and illegal disposals and discharges from citizens, industries and farmers are the main pollution source.

According to the report of the NGO “Defender Water” from 2008, 70% of the rivers, lakes and lagoons of the country are polluted at the time (Source: Jornal do Brasil, 2008). The main pollution sources are pointed as agriculture and industrial activities. The deficiency in inspection and control of the destination and treatment of residues, besides of their incorrect disposal in dump centers are the main reason to the growth of water and groundwater contamination.

The euphoria and the incentive for biodiesel production are also indicated by the NGO as a potential reason for the growth of pollution in the country, once that agronomists tend to not respect environmental laws and principles with the purpose of obtain more profit with the market fervor.

In relation to the present law, companies and farmers have to present studies of impacts and plans of recovery and protection for the impacted areas and water bodies even before the start of their activities. However, most of the projects still under analysis or take too much time to be completed due mainly to excessive bureaucracy, and many of their activities start before the plans be approved, what results in irregular actions and countless impacts.

2.2 Air Pollution Issues

The problem with air pollution in Brazil is found especially in the southeast of the country, where the industrial polos and the big cities, such as São Paulo and Rio de Janeiro are located. The contamination is mainly due to smoke and particulates expelled by the industries and refineries chimneys, vehicles, and a small percentage coming from opened air landfills and dumpsites.

The political of air quality control in the country is a recent issue dating from the end of 1980s when the National Environmental Policy (NEP) and the resolutions 3/1989 and 4/1990 of CONAMA, both constituting the National Programme of Air Quality Control (PRONAR) were established. The resolutions point the monitoring of the air quality through establishment of a basic monitoring network system as an obligation of the member states. However, as shown in the Figure 3, this tool has been not a great instrument, once that not all the states possess a well installed system or a good recorded historical panorama for studies.
As we can see, the monitoring network system does not cover a significant area of the country, occurring only in a few cities. In addition, only a few groups of parameters have been measured in the air.

The problematic is due principally because of the lack of incentive by government and agencies concerning the high costs of investments to obtain the measurement devices and their respectively installation, which makes the work more difficult in a country with the dimensions of Brazil. Other difficult barrier to transpose is the lack of technical and qualified staff to control and to handle such instruments as well to interpret the results.

Nevertheless, with the actual available data is already possible to trace an overview of the air quality within the country. According to the report of the Brazilian Environmental Agency (MMA, 2014), the concentrations of CO, SO2 and also NO2 are under control, with few locations where levels exceed the standard recommendations of the WHO, like in industrial polos in São Paulo. On the other hand, suspended particulate levels show high concentrations much higher than the established national and international patterns, and also the WHO references, as in some cases exemplified in Figure 4.

Figure 3: Historical operation of network monitoring system of the air quality performed by Brazilian member states (Source: MMA, 2014).
It is worth mentioning that the all national standard levels are higher than the WHO recommendations. For instance, the WHO’s recommendation limit for Ozone at ground level is 100 μg/m³ (before 2005, it was 120 μg/m³), while the national standard value is 160 μg/m³. As we can see in the Figure 2.2.3, all the cities have their average annual levels of ozone higher than the recommended standards.
2.3 Deforestation

There are approximately 20000 square kilometers of natural vegetation deforested in Brazil each year as a result of logging and fires.

This process entails various negative factors of the environment, among them are: loss of biodiversity, soil depletion, carbon, climate change, erosion, among others.

Deforestation in Brazil is mainly for the practice of farming. However, the construction of roads, dams, mining and intensive urbanization contribute significantly in reducing forests.

According to calculations of the National Institute for Space Research, the area deforested in the Amazon by 2002 was greater than the size of France. This is mainly due to logging and farming. According to research from the Ministry of the Environment revealed that 80% of wood extraction in the Amazon occurs illegally.

![Tree Cover Loss in the Brazilian Amazon](http://www/xyz)

The Brazilian biome that suffers most from deforestation today is still the Atlantic Forest. Only between the years 2011 and 2012, 235 square kilometers was severely deforested, according to a study by the INPE and NGO SOS Atlantic Forest.

The Atlantic Forest has lost about 93% of its vegetation cover, leaving only 7%. Of Brazil, 15% was occupied by the Atlantic Forest. Today is considered the fifth most endangered area of the planet.

The Cerrado, from the 1950s deforestation was intensified. This was mainly due to the expansion of the agricultural frontier and public policy for the occupation of the Brazilian Midwest. The intense urbanization and agricultural activities are mainly
responsible for deforestation of the Cerrado. According to studies by the Ministry of Environment, 67% of the biome suffered modification.

The Caatinga vegetation had halved due to deforestation. There are approximately 500,000 hectares devastated per year.

Amazon: The largest Brazilian biome, with 369 million hectares, has only 3.6% of its area under federal conservation.

Cerrado: Despite being the second largest biome in Brazil, in addition to containing the richest biodiversity in the world, the cerrado has only 0.8% of its area under protection.

Caatinga: Aside from one area of the National Park of Confusions, this biome has received no protection. Only 0.8% of its area is protected areas.

Atlantic Forest: It has the largest number of Brazil's protected area (36), yet this biome has only 0.69% of its total area under protection, because of the small area of existing protected areas.

Pampas: Only two areas are protected, representing 0.3% of the ecosystem: the Taim Ecological Station and Lagoa do Peixe National Park

Pantanal: Despite its biodiversity, it has only two conservation units, representing 0.55% of its area.
### 2.3.1 Environmental Law

Permanent Preservation Areas are slopes, hilltops and riverbanks, which should be preserved vegetation. Restricted areas include wetlands, Pantanal plains and slopes between 25 and 45 ° tilt. Since the legal reserve is the minimum percentage of native vegetation to be kept on a property, ranging from 20% to 80% depending on the biome.

To relax the old Forest Code, 1965, the new law promoted a drastic and generalized reduction of the legal protection of these areas (APA), which resulted in the area without reforestation at least 29 million hectares across the country. As the reduction, forgiveness fines for illegal deforestation were another major flags caucus during the controversial process of drafting the law.

With the old law, the producer was fined and, in addition to being required to pay the fine, had to restore all the deforested area, but now only need to restore part of it and be enough to do this for your fine is forgiven.

The new law is the consolidation of a formal loss of forest with the amnesty and without no guarantee that the terms of engagement will be met. (Souza, 2015)

### 2.4 Land Use Planning

Illegal and irregular occupations are present in most Brazilian cities, straddling a sad social reality: the lack of housing. But the problem is not just the lack of real estate to live, but also the lack of security ownership, which in turn makes favors the poor quality with which they are built those that exist, particularly in illegal areas.

The informal access to land and consequently to housing is a major problem for decades, strongly exacerbated by the lack (intentional) appropriate housing policies to serve more poor. As Funes (2005) the principal agent of territorial exclusion and environmental degradation is the spatial segregation, which brings with it a long list of social and economic problems, and as a consequence the exclusion and social inequality that promotes discrimination, which generates lower employment opportunities, among other problems, thus leading to a perpetuation of poverty and the absence of citizenship.

Statistical data of the World Bank report that 1 million homes produced in Brazil, about 700,000 are illegal, which proves that most of the housing production in the country is informal.
The consequence of this growing irregular urban occupation is the collapse of public transportation systems, increased erosion, deforestation, silting of rivers and soil sealing as triggering factor of floods, occupation areas of environmental protection, precarious sanitation (waste collection, domestic and pluvial effluents), subnormal agglomerate (favelas).

Figure 8: Perfil of subnormal agglomerate occupation and percentage of inhabitants

3 Conclusion

The size of the country is proportional the size of the environmental problems. The Programa Terra Legal (Programme Legal Land), developed by the Ministries of Agrarian Development and Environment, has the responsibility to regulate the use of
public lands occupied in the Amazon region. This program was successful in restricting the marketing of meat produced on illegally deforested areas and the proper identification of permitted areas for growing sugarcane for the production of ethanol.

Brazil recognizes that it is part of the solution to the problem of climate change. In 2010, Brazil took the necessary steps to advance its climate change commitments made at the COP-15 in Copenhagen. For example, the policy to combat deforestation in the Amazon in recent years has produced positive results, as demonstrated by announcements of increasingly lower deforestation rates. Data from 2010 shows that Brazil has reduced deforestation rates in the Amazon by more than 70%, the lowest deforestation rate in over 20 years. At this rate, Brazil's goal of reducing greenhouse gas emissions by 38.9% could be reached by 2016 rather than 2020.

Regarding the water resources, a research made by the WWF-Brazil and the FGV Institute in 2011/2012 shows that the mainly problems within the country are: The slowly implementation of the instruments of supervision from the government, especially in the charging and framing of the water administration; The heterogeneity of the country, once that this point is not considered to this framework, besides the lack of stimulus to the municipalities to participate on this goal; The political issues find troubles to implement instruments of general administration, hence the insufficient and wrong division of the generated funds to accurate management throughout the country plus the excessive bureaucratization of the society participation on the rules; The low recognition of the regulatory agency and its role in the system; And the not high-priority about the policy of water resources in the country, but only after situations of extreme weather problems, such as severe flooding and droughts.

The Ministry of Environment is responsible for Brazil's national environmental policy. The ministry's many departments deal with climate change and environmental quality, biodiversity and forests, water resources, sustainable urban and rural development, and environmental citizenship. Other authorities are also responsible for the implementation of environmental policies, including the National Council on the Environment, the National Council of the Amazon, the National Council of Water Resources, the Chico Mendes Institute for Biodiversity Conservation (ICMBIO), Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), Board of Management of Public Forests, and others. The collaborative work of these institutions and NGOs make it is indispensable to reduce the environmental problems and to ensure sustainable growth within the means of the environment. In addition, the
bureaucratic impasses of the political instruments and social actions in behalf of the environment have to be break to a better and easier organization be achieved within the country.

“The real cure for our environmental problems is to understand that our job is to salvage Mother Nature. We are facing a formidable enemy in this field. It is the hunters... and to convince them to leave their guns on the wall is going to be very difficult.”

Jacques Yves Cousteau

4 Bibliography

ANA, Agência Nacional de Águas, 2007
FUSP, Fundação de Apoio à Universidade de São Paulo, 2009
IBGE, Instituto Brasileiro de Geografia e Estatística, 2010
INPE, Instituto Nacional de Pesquisas Espaciais, 2012
MMA, Ministério do Meio Ambiente, 2014
SABESP, Companhia de Saneamento Básico do Estado de São Paulo, 2015
SEMARH, Secretaria do Meio Ambiente e dos Recursos Hídricos, 2003
SOUZA, Oswaldo Braga ,Instituto Socioambiental, 2015
WWF-Brasil/FGV, Governança dos Recursos Hídricos, 2014

Web Sites:
Sabesp- http://www2.sabesp.com.br/
Secretaria da Biodiversidade e Floresta- http://www.mma.gov.br
SOS Mata Atlântica- https://www.sosma.org.br
World Resources Institute- http://www.wri.org
WWF-Brasil- http://www.wwf.org.br/