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## **AIR POLLUTION ASSOCIATED WITH BURNS AND OCCURRENCE FOCUS - A BIBLIOGRAPHIC REVIEW**

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**Abstract:** Atmospheric pollution, a major environmental problem today, is not only linked to industrial processes: fires are also considerable contributors. The fires emit polluting gases into the atmosphere that contribute to the intensification of the greenhouse effect and contribute to Brazil being among the most polluting countries in the world. Among other consequences, there is the destruction of biodiversity and the increase in the incidence of cardiorespiratory diseases. For this work, data were collected in a bibliographic survey focusing on occurrences of fires. The data collected show the state of Mato Grosso with the main percentage of annual fires throughout the Brazilian territory from January 2016 to January 2017 and Brazil as the main country with fire outbreaks in South America. The high number of fires in the national territory can be noticed through the collected data. Fires are still common practices in the national territory, but in view of their consequences, they must present decreasing numbers of occurrences over the years.

**Keywords:** Gases, smoke, land use change, atmosphere.

## INTRODUCTION

When talking about atmospheric pollution, one immediately thinks of large power plants with chimneys releasing smoke and polluting the air. But another major contributor to the pollution of the air we breathe is often far from the burning factories. Often, fires are used as a means of cleaning and preparing the soil for planting, also for opening new pastures, as well as other criminal and some accidental actions.

One of the concerns in the use of this activity is the emission of polluting gases released into the atmosphere. Among them are carbon monoxide (CO), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub> - carbon dioxide), these are some of the main gases responsible for the greenhouse effect. According to *Jornal O Globo* (2010/09), as cited by the Brazilian Institute of Geography and Statistics (IBGE, 2010). Fires are responsible for 75% of carbon dioxide emissions in Brazil. This index contributes to the placement of Brazil among the first in the world ranking of polluters

The occurrence of fires in the national territory indicates a great increase in atmospheric pollution. Among its most alarming consequences, as reported by *Pensamento Verde*, are: global warming, destruction of natural habitats, fauna and flora, there is also the incidence of diseases caused by smoke from fires (mainly from the respiratory tract), aggravated by carcinogenic dioxins (when there is plastic involved in the burning) identified by the Institute of Technology of the Federal Rural University of Rio de Janeiro (UFRRJ).

Brazil is a tropical country with particular characteristics. According to the climate that it presents, together with its clarity and temperatures together with the rainfall, everything allowed by being in an area of great reception of solar energy of the Planet

the intertropical belt. The air we breathe is a heterogeneous substance composed of gases that, adjusted to each other, distinguish the Earth from the others, and its characteristics allowed the maintenance of life on its surface (MENDONÇA and DANNI-OLIVEIRA, 2007).

Burning is still widely used by farmers for cleaning and soil preparation before planting (Figure 1). Often, this practice is done indiscriminately and without monitoring, causing damage to the soil, such as the elimination of essential nutrients to plants. Fires also bring a series of damages to biodiversity, ecosystem dynamics and air quality (EMBRAPA, 2015).

Having seen the importance of this topic, bibliographic surveys were carried out where the main consequences of the fires were verified, such as: release of carbon dioxide into the atmosphere, a great contributor to global warming; increase in the hole in the ozone layer; destruction of natural habitats of several species; soil erosion; loss of soil absorption, increasing flood rates; pollution of springs, groundwater and rivers through ash; extinction of species (fauna and flora) (VERDE, 2013). In order to present problems related to atmospheric pollution caused by fires, this research brings data on the occurrences of fires in the year 2016 in the national territory and a comparison of the same period in South America.

## **MATERIALS AND METHODS**

To compile the data, electronic research means were used from websites of the National Institute for Space Research (INPE) and Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) to collect statistical data and prepare graphics, as well as journalistic websites such as (O Globo) and academic websites such as Scientific Electronic Library Online (Scielo) and the Federal Rural

University of Rio de Janeiro (UFRRJ), and printed bibliographic references, such as books and academic journals.

## **RESULTS AND DISCUSSION**

It was found through data provided by INPE the occurrence of fires throughout the Brazilian territory during the year 2016, with a total of 1,987,878 outbreaks. It could also be observed that the state of Mato Grosso had the highest rate with 16.3% of occurrences. The data collected from INPE were organized in descending order according to the fire rate (Table 1 and Figure 2).

For South America, the comparison between countries places Brazil as responsible for 56% of fires that occurred in the period, with the general total being 3,521,359 according to INPE. The data collected through INPE were organized in descending order according to the percentage of fires (Table 2). All data presented are concentrated in the period from 01/01/2016 to 01/01/2017.

## **FINAL CONSIDERATIONS**

It was noted that with the frequent occurrence of fires throughout the Brazilian territory, the impact of their actions has generated great influence on atmospheric pollution. In addition, other aspects of preservation and conservation of the environment are also affected, such as the biodiversity of fauna and flora, as well as human health. This is a controversial subject, since despite having several harms to all ecosystems, it is still a widely used and often indiscriminate practice.

Considering article 225 of the Brazilian Federal Constitution of 1988, which states "Everyone has the right to an ecologically balanced environment, a good for common use by the people and essential to a healthy quality of life, imposing on the public power and the community the duty to defend it".



Figure 1. Smoke screen in pastures in Rondônia (Photo: Jonatas Boni/ G1)

Estado	Percentual de queimadas
Mato Grosso	16,30%
Pará	13,90%
Maranhão	12,10%
Tocantins	10,10%
Rondônia	6,30%
Amazonas	5,30%
Piauí	4,80%
Goiás	3,90%
Minas Gerais	3,90%
Bahia	3,70%
Mato Grosso do Sul	3,60%
Roraima	3,30%
Acre	2,30%
Ceará	1,80%
São Paulo	1,70%
Paraná	1,40%
Rio Grande do Sul	1,10%
Amapá	1,10%
Santa Catarina	0,70%
Pernambuco	0,60%
Espírito Santo	0,40%
Alagoas	0,30%
Rio de Janeiro	0,30%
Rio Grande do Norte	0,30%
Sergipe	0,10%
Distrito Federal	0,10%

Table 1. Percentage index of fires in Brazil according to INPE (National Institute for Space Research) from 01/01/2016 to 01/01/2017

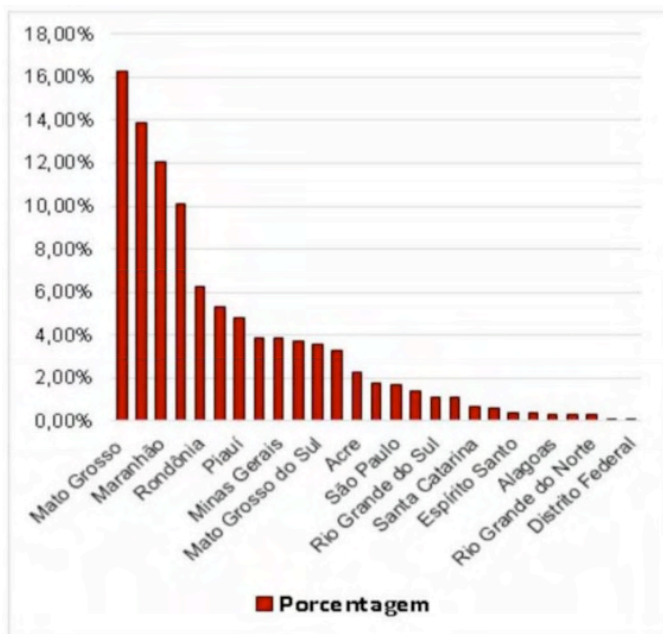


Figure 2. Fire outbreaks in Brazil according to INPE (National Institute for Space Research) 01/01/2016 to 01/01/2017 - Total: 1,987,878 outbreaks

Nacional de Pesquisas Espaciais) de 01/01/2016 à 01/01/2017 - Total: 3.521,359

Country	Percentage of burns
Brasil	56,50%
Bolívia	11,50%
Argentina	8,00%
Venezuela	7,50%
Paraguai	5,90%
Colômbia	5,00%
Peru	3,30%
Equador	0,90%
Chile	0,80%
Guiana	0,40%
Suriname	0,10%
Uruguai	0,10%
Guiana Francesa	0,10%

Table 2. Percentage index of fires in South America according to INPE

it and preserve it for present and future generations”, there is an urgent need to comply with the provisions of this article, since its practice does not help in the preservation of the environment for present and future generations, and interferes negatively in the quality of life. of the population.

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