The integrated management of fire in protected areas, as an action of the national policy for civil protection and defense in Brazil

O manejo integrado do fogo nas unidades de conservação, como ação da política nacional de proteção e defesa civil no Brasil

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1 INTRODUCTION

Every year, all Brazilian biomes suffer from natural disasters resulting from forest fires. Besides the negative impacts caused to the flora and fauna, the damage to human health is increasing.

The integrated fire management (IFM), currently already used in federal Conservation Units (UC) in the country is a new approach in the actions of prevention and response to forest fires. Citing a case study of prescribed burning carried out in the Serra da Canastra National Park, the proposal is to present the advantages of IFM and its close association between environmental and civil protection and defense actions, checking the literature and standards that address the subject, as well as presenting the related conceptualizations and definitions.

2 OBJECTIVE

To search for literature and standards that address the research topic, revealing the related conceptualizations and definitions, as well as the advantages of using integrated fire management in the conservation units in Brazil, promoting an association between the environment and civil protection and defense in order to avoid or minimize the damage caused by forest fires.

3 METHODOLOGY

By means of a qualitative bibliographical, descriptive and documental research according to MARCONI (2013) and CRESWELL (2007), literature and norms that address the studied theme will be sought. And through a case study of a real case of use of the FIM method, with the Serra da Canastra National Park, data will be collected for discussion of the results obtained and for the promotion of comparative analysis of the actions employed between the major areas of environment and protection and civil defense.

4 DEVELOPMENT

Occupying almost half of South America with its 8.5 million km², Brazil is a country of continental proportions and has several climate zones, leading to a large ecological variation and counting with six major biomes (IBGE, 2022).

Although it is the country with the greatest biodiversity in the world, every year all Brazilian biomes are threatened by forest fires, bringing damage to the flora, fauna, and human health.

According to a technical study conducted by the National Confederation of Municipalities (2021), between the years 2016 and 2021, fires and forest fires caused more than R$ 1.1 billion in damages throughout Brazil. Also according to the study, there were 2,111 decrees of emergency situations registered in the National Secretariat of Protection and Civil Defense (SEDEC/MDR).

The human damage caused by forest fires during the years 2016 to 2021 is alarming. As can be seen in Table 1, in the 6-year period, 3,470,163 people were affected.

Table 1 - Human Damage

Year	Deaths	Injured	Sick	Homeless	Homeless	Total Affected People
2016	0	2	0	6	2	52.629
2017	3	4	0	709	832	387.380
2018	0	21	921	454	2.692	6.917
2019	0	17	574	20	284	1.029.067
2020	8	16	14	0	192	499.843
2021	1	11	3	344	705	1.494.327
TOTAL	**12**	**71**	**1.512**	**1.533**	**4.707**	**3.470.163**

SOURCE: SEDEC/MDR - Elaboration by CNM Civil Defense (adapted).

In a new study conducted by the United Nations Environment Programme (UNEP) and published in the report "Fire Out of Control: the growing threat of atypical wildfires" (UN, 2022), with the climate crisis and changes in land use, forest fires are predicted to increase by 50% by the year 2100.

According to studies published in the UNEP report, it is predicted that there will not be an increase in forest fires as is mostly observed, but rather, extraordinary forest fires with large proportions, strong destructive power, and highly damaging (UN, 2022).

The UNEP report makes a strong appeal to governments that two-thirds of the investment should be for planning, prevention, preparedness and recovery and one-third of the money used for response work (UN, 2022).

In Brazil, since the year 2012 in a joint effort of the Ministry of Environment, Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) have been adopting a new approach similar to PNPDEC in the "prevention, mitigation, preparedness, response and recovery" (Brazil, 2012) to forest fires, with the use of Integrated Fire Management (IFM) and the development of a National Policy on the subject.

The MIF was officially implemented by ICMBio in the federal Conservation Units through Ordinance No. 1,150 of December 6, 2022, (ICMBio, 2022), being understood as:

> Adaptive fire management approach that integrates traditional, scientific, and technical knowledge for planning, decision making, management, and monitoring, considering the interaction of ecological, sociocultural, and economic aspects of the territory (ICMBio, 2022).

Also, the mentioned Administrative Rule (ICMBio, 2022) provides tools for the management of combustible material, such as prescribed burning, the creation of black firebreaks (with the use of fire), and other forms of preventing forest fires.

It is important to note that the use of fire when necessary is done observing several aspects, such as: the best time of the year, favorable weather conditions, topography, among other factors.

According to Brazil (2012), the Brazilian Forest Code provides for civil defense actions and allows the use of fire in forest fire prevention and fighting actions, however, there is still resistance by a few Brazilian states in the use of fire and its regulation for

protection purposes and in the use by indigenous peoples, as well as, by traditional communities.

Federal Conservation Units have been publicizing in seminars, conferences, congresses, and other media about the effectiveness in implementing FIM (including the use of fire) and reducing the incidence of forest fire outbreaks or large fires (ICMBio, 2019).

The Serra da Canastra National Park has become a reference in the use of IFM and has already developed its Integrated Fire Management Plan (PMIF), an instrument in accordance with Ordinance #150 of December 6, 2022 (ICMBio, 2022).

The PMIF (ICMBio, 2022) is a strategic document for organizing and systematizing fire management actions and includes:

> [...] fire risk assessment; fuel management; biodiversity management; protection; research and monitoring of the effects of fire; environmental education and communication; social participation; maintenance of the livelihoods of related communities and their use of fire and; other related contents, according to the particularities of each conservation unit (ICMBio, 2022).

According to Tizianel, Bruno, Tizianel (2019) the adoption of the zero fire policy contributed to the occurrence of fires that on several occasions reached more than 25,000 hectares per event.

The National Policy for Protection and Civil Defense (PNPDEC), according to Brazil (2012), brings as a duty of the Union, the States, the Federal District and the Municipalities to adopt necessary measures aimed at reducing disaster risks.

According to the PNPDEC (Brazil, 2012), prevention, mitigation, preparedness, response, and recovery actions for civil protection and defense are covered in an integrated manner with public policies, including those for the environment.

A few Brazilian states, such as the state of Rio de Janeiro, adopt a preservationist attitude where the protection of the environment must be done without human intervention, restricting the use of fire even in preventive actions, causing accumulation of combustible material and generating fires of large proportions as can be seen in Law No. 2.049 of December 22, 1992 (Rio de Janeiro (State), 1992).

Adopting prevention and response measures to forest fires using a new approach, which takes into account the social, cultural, ecological aspects and the whole structure of fire management, fully justifies this innovation of protection method and civil defense and environment, with the advantages and excellent and satisfactory results.

5 CONCLUDING REMARKS

Brazil, as a country of continental proportions and sheltering several biomes, needs a new approach in the actions of prevention and response to forest fires. Integrated fire management proposes the survey and application of the social, cultural and ecological aspects of the region, as well as the whole structure of fire management. With the survey of the concepts, definitions and advantages of the FIM application, we seek a deeper understanding of the subject and a clarification for the Brazilian states that still adopt a standard attitude at the national level, without taking into consideration the technical and technological innovations and the sociocultural and ecological aspects of their regions.

REFERENCES

BRASIL. Instituto Chico Mendes de Conservação da Biodiversidade. PORTARIA N° 1.150, DE 06 DE DEZEMBRO DE 2022. Estabelece princípios, diretrizes, finalidades, instrumentos e procedimentos para a implementação do Manejo Integrado do Fogo nas Unidades de Conservação Federais. Disponível em: https://www.in.gov.br/en/web/dou/-/portaria-icmbio-n-1.150-de-6-de-dezembro-de-2022-448579352. Acesso em: 08 mai. 2023.

BRASIL. Instituto Chico Mendes de Conservação da Biodiversidade. Plano de Manejo Integrado do Fogo, Parque Nacional da Serra da Canastra. Brasília, 2022. Disponível em: https://www.gov.br/icmbio/pt-br/assuntos/biodiversidade/unidade-de-conservacao/unidades-de-biomas/cerrado/lista-de-ucs/parna-da-serra-da-canastra/arquivos/PMIF_PARNA_SERRA_CANASTRA_2023_2026.pdf. Acesso em 09 mai. 2023.

TIZIANEL, F; BRUNO, S; TIZIANEL, B. Título: Queimas prescritas precoces no Parque Nacional da Serra da Canastra como estratégia de contenção de grandes incêndios dentro do Planejamento de Manejo Integrado do Fogo. Bio Brasil Revista Científica. ICMBio, a. 9, n. 1, p. 67, 2019. Disponível em: https://revistaeletronica.icmbio.gov.br/BioBR/issue/view/65/8. Acesso em 10 mai. 2023.

BRASIL. Instituto Chico Mendes de Conservação da Biodiversidade. Bio Brasil Revista Científica. Wildfire Conference: Resumos. ICMBio, a. 9, n. 1, p. 67, 2019. Disponível em: https://revistaeletronica.icmbio.gov.br/BioBR/issue/view/65/8. Acesso em 10 mai. 2023.

BRASIL. LEI N° 12.651 DE 25 DE MAIO DE 2012. Dispõe sobre a proteção da vegetação nativa e dá outras providências. Disponível em: https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm. Acesso em: 26 abr. 2023.

CONFEDERAÇÃO NACIONAL DOS MUNICÍPIOS. Disponível em: https://www.cnm.org.br/cms/biblioteca/Os-perigos-das-queimadas-e-incendios-florestais_2016-a-2021_19.11.2021.pdf. Acesso em 11 mai. 2023.

IBGE – INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Malha Municipal Digital e Áreas Territoriais 2022. Rio de Janeiro, RJ: IBGE, 2022.

ONU. PROGRAMA DAS NAÇÕES UNIDAS PARA O MEIO AMBIENTE (PNUMA). Relatório, Fogo Sem Controle: a crescente ameaça de incêndios atípicos em ambientes selvagens. Disponível em: https://www.unep.org/pt-br/resources/relatorios/fogo-sem-controle-crescente-ameaca-de-incendios-atipicos-em-ambientes. Acesso em: 3 mai. 2023.

RIO DE JANEIRO (Estado). LEI N° 2.049 DE 22 DE DEZEMBRO DE 1992. Dispõe sobre a proibição de queimadas da vegetação no Estado do Rio de Janeiro em áreas e locais que especifica e dá outras providências. Disponível em:http://alerjln1.alerj.rj.gov.br/CONTLEI.NSF/b24a2da5a077847c032564f4005d4bf2/485fe39fc6e8451e0325651b0068e926?OpenDocument#:~:text=Lei%20Ordin%C3%A1

ria&text=LEI%20N%C2%BA%202049%2C%20DE%2022,ESPECIFICA%20E%20D%C3%81%20OUTRAS%20PROVID%C3%8ANCIAS. Acesso em: 08 mai. 2023.

MARCONI, M. de A. & Lakatos, E. M. Metodologia do trabalho científico. (7a. ed.). São Paulo: Atlas, 2013.