International Journal Semiarid

EDUCATIONAL PRACTICES FOR THE PREVENTION AND MITIGATION OF WILDFIRE RISKS IN THE CITY OF CAMPO GRANDE-MS, BRAZIL

Bianca Garcia Oliveira
Masters Student in Geography at the Federal University of Mato Grosso do Sul, Aquidauana campus.
https://orcid.org/0000-0002-1444-4767
bianca.garcia@ufms.br

Vicentina Socorro da Anunciação
Professor, Dr. in Geography, Federal University of Mato Grosso do Sul, Aquidauana campus.
https://orcid.org/0000-0001-8571-5109
vique56@hotmail.com

ABSTRACT
Socio-environmental problems, such as burnings, wildfires and hotspots represent a risk to the ecosystem because of their consequences for all forms of life in the biotic environment, and the main cause has been due anthropic action. Thus, this research aims to analyze the general issue of risk to wildfires with public basic education in the city of Campo Grande-MS, Brazil, and as specific objectives: to raise the main local public policies on fires and propose the construction of a pedagogical paradidactic resource aimed at collaborating with the thematic approach that can be used in formal and non-formal educational institutions. In this sense, this study intends to approach and discuss phenomena related to wildfires, fires and hotspots that pose a risk to the environment and human health through geographic education. The National Policy for Protection and Civil Defense points out the need to adopt measures aimed at reducing disaster risks and the Common National Curriculum in the discipline Geography in the thematic unit called nature, environment and quality of life ensures the approach thematic of fires in the teaching of this curricular component. However, it is still necessary to approach the theme in order to problematize the environmental issue, converging to changes in attitude towards the facts.
Keywords: Education, Teaching, Burning, Fire.

PRÁTICAS EDUCATIVAS PARA A PREVENÇÃO E MITIGAÇÃO DOS RISCOS A QUEIMADAS NA CIDADE DE CAMPO GRANDE-MS, BRASIL

RESUMO
Os problemas socioambientais, a exemplo das queimadas, incêndios e focos de calor representam um risco ao ecossistema, pois acarretam consequências para todas as formas de vida no meio biótico, sendo a principal causa a ação antrópica. Deste modo, a presente pesquisa tem como objetivo geral analisar o tema riscos a queimadas com a educação básica pública na cidade de Campo Grande-MS, e como objetivos específicos: levantar as principais políticas públicas locais sobre queimadas; Propor a construção do recurso pedagógico paradidático visando colaborar com a abordagem temática que podem ser utilizadas em instituições formais e não formais de ensino. Nesse sentido, tenciona este estudo a abordagem e discussão de fenômenos relacionados às queimadas, incêndios e focos de calor que representam um risco para o ambiente e saúde humana através da educação geográfica. A Política nacional de proteção e defesa civil aponta a necessidade de adotar medidas visando a redução dos riscos de desastres e a Base nacional comum curricular na disciplina Geografia na unidade temática natureza, ambiente e qualidade de vida assegura a abordagem temática queimadas no ensino deste componente curricular. Contudo, ainda se faz necessária uma abordagem da temática de modo a problematizar a questão ambiental, convergindo para mudanças de atitude frente aos fatos.

Palavras-chave: Educação, Ensino, Queimada, Incêndio.

INTRODUCTION

In modernity it is noticeable the phenomenon of deforestation and fires evidenced in the ecosystem ascending ostensible approaches related to confronting environmental issues, from the global to the local context. According to the National Institute for Space Research (INPE, 2020), Brazil concentrated 5,188,859 detected fires (data from all satellites) representing 55.9% of the fires and referring to the state of Mato Grosso do Sul congregated 308,014 fires, equivalent to 5.9%. From this amount, the city of Campo Grande aggregated 1,547 fires which was equivalent to 0.5%, and the index of 215 fires that is equivalent to 0.06% of the episode materialized in the urban area. Inferring about the causes, effects, and consequences of the problem goes through references to anthropic actions, the impacts on biodiversity, the obstacles to human health, besides the direct degradation of the environment, destroying genetic, biological, cultural, and historical wealth, among others.

In this context, we must emphasize the need for a change in mentality as highlighted by Morin (2000) that pertinent knowledge is that which occurs when placed in a large context, which materializes the importance of this thematic approach contextualization in education, since it enables the understanding of the importance of natural resources and their relationship with society. As schools are places of knowledge sharing and formal education, it guides a direction in fostering debates around these issues, the sensitization to the problems and the formation of autonomous students as environmental ambassadors.

According to Freire (1987, p.43), "authentic liberation" is in the praxis, action and reflection of the world, only then to be able to transform it, considering man as a "conscious body" in the problematization of the relations between society and nature. In this analysis, the problem of burning and fires is associated with the problematization of burnings and fires; moreover, the socio-environmental problems that occur represent a risk, increasing the probability of the population and the environment to be negatively affected by the phenomenon. In this sense, education for risk and disaster reduction emerges from the perspective of broadening the debate on strategies for actions that can synchronize the desires of the local base, legislation, managers, and agencies responsible for the biosystem defense and the population well-being.

As highlighted by Matsuo and Silva (2021 p.3), "education is an essential element for the creation and strengthening of a culture of risk and disaster prevention". Thus, it leverages problematization about socio-environmental problems, enabling the analysis of causes, consequences and proposition of mitigating measures, in addition to the development of critical thinking about the relationship between society and nature and the importance and influence of culture in the construction of different worldviews associated with individual perception and social representations built from these relationships around the theme addressed.

Thus, the genesis of this study, comes with the desire to provide to basic education students, elementary II from the Antônio José Paniago Municipal School in the city of Campo Grande-MS, some experiences with active participation, in order to enhance awareness about issues related to burning and fires in the urban context of the city, in the sense that students can independently and autonomously take on attitudes and values

aimed at the protection and conservation of the environment, since the geography teaching is an important tool in the construction of ecological themes and development of critical thinking capable of transforming reality through individual and collective actions for the sustainability of the environment.

MATERIAL AND METHOD

With the purpose of obtaining results from the objectives set out, theoretical and methodological reflections were conducted anchored in scientific articles of singular relevance on the theme of fires, fires and risks, geography teaching, legislation on risks education in the Brazilian educational system and a survey of the main local public policies on the theme studied.

In this study, an exploratory qualitative analysis is contemplated because it enhances the students' ideology by exploring discoveries and intuitions, familiarizing all the social actors involved in the investigation process with the analyzed problem, encouraging the student to learn in an autonomous and participatory way, based on the local reality.

In this way, starting from the theme "Cenário geográfico de uma cidade ardendo em chamas" (Geographic scenario of a city burning in flames), an extension project was developed with students from the 6th grade at the Antônio José Paniago Municipal School, with the purpose of bringing students closer to the analysis and understanding of burning risks in the city of Campo Grande-MS. The actions were developed according to the following didactic sequence involving four stages with their respective phases (Table 1).

Table 1: Didactic Sequence

TITLE: BURNINGS - DAMAGE IS NOT ONLY FOR NATURE
Content: Human impact on the environment. Burning, fires, hotspots, risks, natural disasters, perception, ecodevelopment, ecology, landscape, ecological awareness. Environmental laws. Risks of wildfires. The main local public policies on fires.
Class: 6th grade
Objectives: To reflect on the human action in the environment. To know environmental laws related to burning and deforestation in the national, state and municipal spheres. To identify the causes of fires in Brazil, in the State of Mato Grosso do Sul and in the city of Campo Grande. To understand the risks of this practice. To recognize the care needed to avoid the practice of criminal burning. To propose actions, alternatives or possible solutions to avoid or minimize environmental damage caused by burning.
Estimated time: 20 hours
Material needed: Map of Campo Grande-MS; Text of Laws (Law nº9.605 of February 12nd 1998 - Environmental crimes law; Law nº 12.651 of May 25 2012- New Forest code; Law nº12.305 of August 2nd 2010 - National solid waste policy; Law nº9.795 of April 27 1999

- National environmental education policy; Bill n°11. 276 of 2018 - National policy of integrated fire management); (Decree nº15.654 of April 15 2021 - State policy of integrated fire management; Resolution from IBAMA/MS, nº1 of August 8 2014 - Prohibits controlled burning in Mato Grosso do Sul during specific periods and situations; Law nº2.909 of July 28 1992 - Administrative police code of the municipality of Campo Grande).

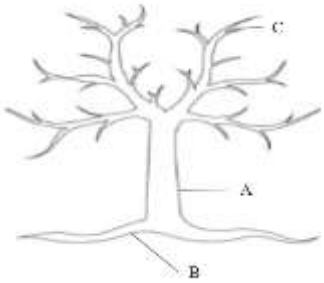
Articles, texts and books on the concepts of:
Burning, fire, hotspot, ecodevelopment, landscape, ecology and perception.
Laptop; Internet; USB flash drive; Data show; Sulfite sheet A4; Sulfite sheet A0; Pencil; Crayons; Pen.

Development:

Mediation on a conversation circle on the topic fires; the teacher dialogues with students about what they know about the theme and how it is present in their daily lives. After this thematic immersion, a guiding question was put in the platform (https://www.wordclouds.com) asking students to categorize the debated theme by summarizing it in three words, creating a word cloud from the topic, a cloud from the topic fires, and another one with the topic environmental warming. The teacher took advantage of the moment to emphasize the terminologies that stood out, clarify doubts, and explore details of the theme discussed. He emphasized the natural, social, and technological causes, among others that are contained in the theme, how space is built aggravating the impacts, the threats and dangers, leaving the environment and life more vulnerable to the events.

Then, he asked the students to build a thematic mind map about fires; the mind maps were made with the following theme: burnings in the place where they live, aiming to bring the topic burnings closer to the students' reality. The analysis of the mind maps went through the criteria used by Kozel (2018), taking into consideration: shape, distribution, specification, and particularities. Subsequently, supported by a brainstorming activity, an expository dialogued class was held emphasizing environmental education in the critical aspect, addressed to the students the following concepts: burnings, fires, hotspots, perception, ecodevelopment, ecology, landscape and ecological awareness.

It was explored the students' ideas about the concepts, highlighting and emphasizing the perceptions expressed by the students. In order to analyze the problem by identifying relative causes and effects in a thorough way, the class was divided into fractional groups that received an A4 size sheet with the drawing of a dry tree having only branches, writing the central theme on the trunk, the causes on the root, and the consequences on the branches. In the plenary, the groups exposed the trees and concatenated the ideas in the A0 size picture. The letter "A" represents a central theme developed in the thematic approach curriculum, resulting in the name of the tree. The letter "B", represented by the roots, is the central issue, and as well the causes of the central theme. The letter "C" represented by the branches, are the consequences.



Evaluation

After going through all the stages of the theoretical-methodological thematic construction, hold an exhibition of the study carried out. Invite the whole school community, professionals and other interested parties to participate. Present the knowledge fair, the research exhibition sharing all the methodology developed and products generated, providing a closer contact with the science produced in educational environments. Also make use of the school's social network/profile as a communication tool, with the purpose of disseminating the activities developed in video or image form. The project was segmented into four consecutive phases, consisting of a conversation circle, construction of the mind map, expository and dialogued class, construction of the word cloud and the morphological tree of the burning theme, and research exhibition.

Source: Prepared by the author, 2022.

RESULTS AND DISCUSSION

School geography becomes important in the construction and meaning of the students' world, since concepts, contents, and methodologies used in teaching and learning processes collaborate with the space observation of the geographic phenomena, associated with reading and construction of different points of view through signs and meanings. In this sense, it enhances the reflections on socio-environmental problems, the relationship between society and nature, risks, and fires.

Regarding the insertion of Education in Civil Defense in the Brazilian education system, Law n° 9.394, of December 20, 1996 establishes the Guidelines and Bases of National Education (BRASIL, 1996) and changes made by Law n° 12.796, of 2013, determines in Art. 26. that "The curricula of early childhood education, elementary school, and high school should have a common national basis, to be complemented, in each education system and in each school establishment, by a diversified part, required by regional and local characteristics of society, culture, economy, and learners (BRASIL, 2013).

In addition, the document highlights in paragraph VII that "The curricula of primary and secondary education must include the principles of protection and civil defense and environmental education in an integrated manner to the mandatory content." (BRAZIL, 2013). Inherent to these proceedings, Law No. 12,608 from 2012 establishes the National Policy for Protection and Civil Defense (PNPDEC) and provides for the National System for Protection and Civil Defense (SINPDEC), presented as its primary objective to reduce the risk of disasters. It is emphasized in paragraph XIII of Art. 5 that "It is the Union's duty to support the teaching community in the development of educational material

related to the development of culture and disaster prevention" (BRASIL, 2012). According to Hamann *et al.* (2019, p.201) risk education aims to create a safety culture for risk reduction that requires the transversal approach of the topic in the school curriculum at all levels of education. In this sense, it is important to study about risks, focused on the reduction as well as preventive measures and awareness about disasters with a view to the development of critical thinking.

It is also worth noting that the Common National Curricular Base (BNCC) includes environmental issues and risks in the content of Geography, such as the skill (EF03GE11) that deals with the impacts of urban and rural economic activities and risks arising from machinery and tools; The skill (EF04GE11) that deals with anthropic action and the conservation and degradation of natural and anthropic landscapes; (EF05GE10) aspects of environmental quality and pollution; (EF05GE11) environmental problems around schools and homes; (EF05GE12) public institutions and improvement of the quality of life; (EF06GE01) modifications in landscapes; (EF06GE06) characteristics of transformed landscapes; (EF06GE07) relation between society and nature; (EF06GE10) different forms of land use and occupation; (EF06GE13) positive and negative points of anthropic action on nature, among others (EF08GE17) contemplates among other concepts the study of risk zones; the skill (EF07CI13) contemplates among other terms to be studied (burning of fossil fuels, deforestation, burning, etc. (MINISTRY OF EDUCATION, 2017).

In this vein of theoretical and conceptual approach, geography contemplates the education for risk fostering reflection on the socio-environmental phenomena, assisting in prevention and mitigation of the effects of risks related to fires, enhancing the development of critical thinking about the phenomenon. The teaching of geography intending reflections related to the reduction of disaster risks such as fires, deforestation and fires awakens action with plans, preventive actions in risk management and mitigation, inherent in awareness activities bringing cultural change of social responsibility of each citizen facing threats.

In this sense, Hamann et al. (2019, p.201) highlights the importance of civil defense at school as an instrument of awareness and prevention of future disasters, especially from school projects associated with environmental education. Barbosa (2016, p.83) emphasizes that Geography in schools seeks to develop the critical sense of students so they can act in a reactive and propositional way in the face of social injustices, i.e., it promotes a practical learning with emancipatory intention. In this way, Geography allows us to look at the socio-spatial transformations and study how and where they occur, establish relationships between them and anthropic actions, and react in a critical way.

Regarding local legislation on burning and fires, Decree nº15.654 of April 15th 2021 is noteworthy. It establishes the State Plan for Integrated Fire Management, deals with the authorized use of fire and other specifications regarding the terms: forest fire, integrated fire management, prescribed burning, controlled burning, burning, among others (DOE, 2021). There is also the Law No. 2.909 of July 28th 1992, which establishes the Administrative Police Code of the municipality of Campo Grande and in Art.18, paragraph II puts "It is forbidden to use burning for land clearing purposes provided for in this article, subjecting the owners who violate it to legal sanctions". (CAMPO GRANDE; SEMADUR, 1992 p.5).

In addition, it has been held since 2017, by the COMIF (Municipal Committee for Prevention and Combat of Forest and Urban Fires), the urban fires campaign, aimed at raising awareness of the population through actions to prevent, monitor and combat urban fires (PLANURB, 2020). And, in allusion to the campaign, it was instituted by the Law No. 5.84, of September 13rd 2017 the Orange August, there is, the "month to raise awareness of fighting the use of fire in vegetation at the municipal level" (DIOGRANDE, 2017). Thus, the current legislation is an important instrument for planning joint actions aimed at preventing, controlling and combating burnings and fires in the city of Campo Grande.

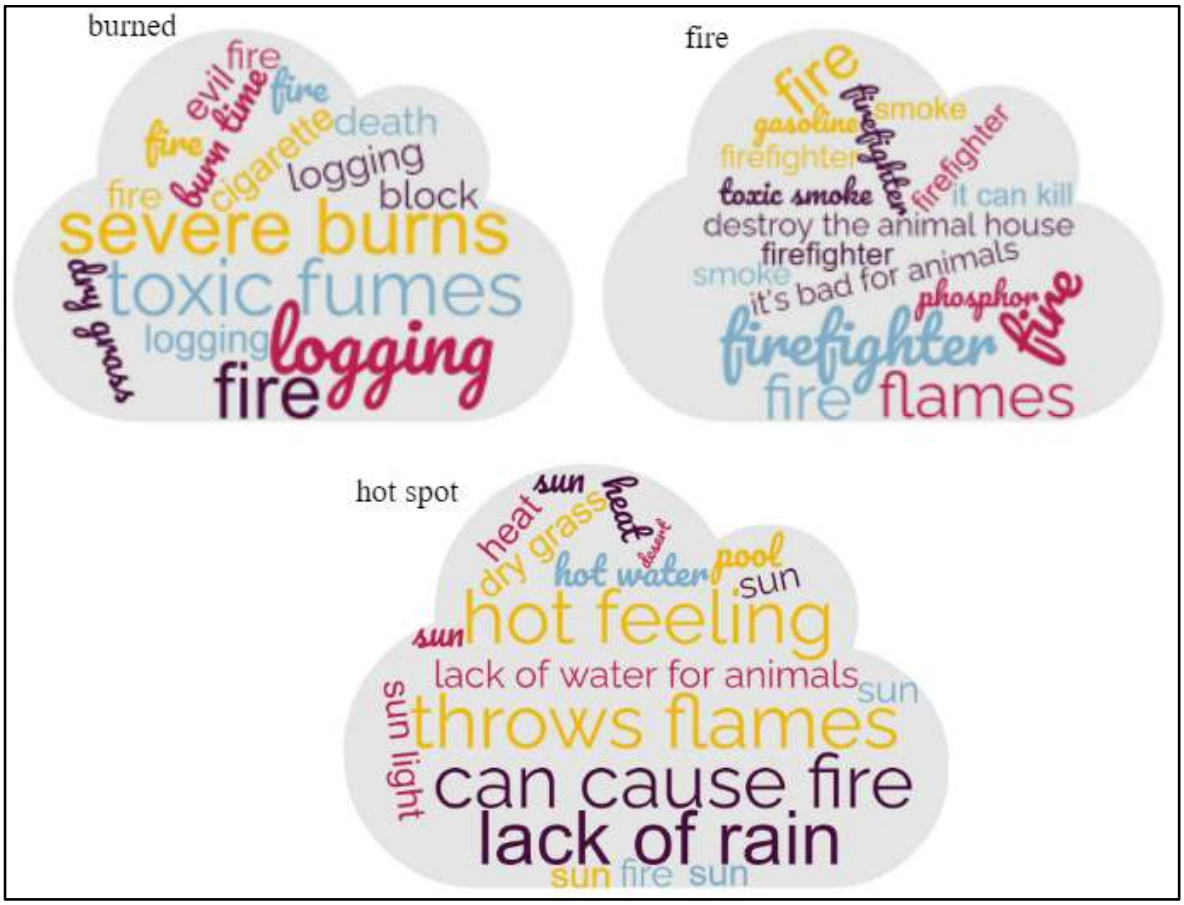
In view of the legislation in force at local level, an extension project was developed at the Antônio José Paniago Municipal School, located in the city of Campo Grande-MS. The project was carried out applying a didactic sequence with 6th graders (figure 1) through the following activities: word cloud, mind maps, expository lesson and construction of the tree of problems, aiming to analyze the perception of students about the phenomenon of burnings and fires in the city of Campo Grande.

Figure 1: Initial activities in class.

Source: Prepared by the author, 2022.

The initial activity involved the construction of word clouds with the terms as the central themes of the clouds: Burning, Fire, and Hotspot. The students were initially asked to say the word that came to mind when saying "Burning", then "Fire" and "Hotspot". Each student individually said a word that came to their mind associated with each one of the terms. These words were added in the online platform (https://www.wordclouds.com) and formed three distinct word clouds (figure 2).

Figure 2: Word Cloud obtained by brainstorm activity with the students.



Source: Prepared by the author, 2022.

It is possible to observe in figure 2 that when it comes to "Burning" the word associated with this concept which appears more than once is fire, totaling 5 times, followed by the word deforestation that appears twice. In comparison to the "Fire" cloud, the word that appears more often is firefighter, totaling 5 times, followed by the word fire that appears 3 times. And in the "Hotspot" cloud the most repeated word is sun, totaling 5 words, followed by the word heat that appears 3 times. In addition, it is also possible to observe words in common such as the “fire” present in all clouds. Thus, the perception of students in relation to the concepts Burning; Fire and Hotspot is similar, once the repetition of words is observed among the clouds and, in addition, the word "fire", common to all clouds, shows that all concepts are related to the occurrence of fire.

It is also worth noticing that some words and phrases are different from one cloud to another, such as "deforestation", "court", "cigarette", "evil", "severe burns" and "burning time" that appear only in the cloud about burning; the words "fireman", "phosphorus" and "gasoline" are present only in the cloud about fire; And the words "sun", "sunlight", "heat", "pool", "desert", "hot water", "lack of rain", "can cause fire", and "heat sensation" are only present in the heat focus cloud, evidencing a differentiation of one concept from another.

It is also possible to observe common words in only two clouds, such as the cloud about burning with emphasis on the term "dry bush" also present in the cloud about hotspot;

also common to the terms "toxic fumes", "toxic smoke", "death" and "can kill" common to the clouds about burning and fire and the terms "flames", "is bad for animals", "destroys the animals' home" and "throws flames", "lack of water for animals" present respectively only in the clouds about fire and hotspot. Thus, the common words in only two clouds indicate that the students associated these words with two concepts: burning and fire; burning and heat focus or fire and heat focus. In view of these concepts, students were asked in the next activity to individually draw a picture (figure 3) with the theme “Burnings in the place where I live”, aiming to bring the theme of burnings and fires in Campo Grande closer to the place where they live so that students could relate with the theme.

Figure 3: Mind maps drawn by the students.

Source: Prepared by the author, 2022.

Based on the criteria analysis, according to Kozel (2018)., the representations presented icons and phrases distributed horizontally, containing the following specifications: natural landscape elements, such as trees, sun, clouds, birds, and vegetation; built landscape elements, such as houses, kite, and fence; and moving elements, such as fire and smoke.

Among the elements used in the representation of burning, color was one of the most used, especially to highlight the fire in the drawings, showing the intensity of burning and its propagation in the environment. In addition, it was also possible to observe the impacts resulting from the action of fire, such as the death of animals, flight of birds, pollution, risks to humans, degradation of flora evidenced by burning trees and other burnings.

It is also important to highlight the environmental concern contained in some phrases present in the drawings, such as "no deforestation", "no fire", "say no to fire!”. Another important point observed was the proximity of fire to residences or inside houses, bringing anthropic and urban aspects to the drawings in other representations, the association of the sun as the cause of fire due to the proximity of this element to the fire and the same size and colors used to represent fire.

In this way, the mental maps presented natural and anthropic elements, with the cause of fire coming mostly from the natural element, the sun. In view of the causes and consequences of burnings and fires, a slide presentation and the construction of problem trees (figure 4) were carried out in a later activity.

Figure 4: Slide presentation and students building the problem trees.

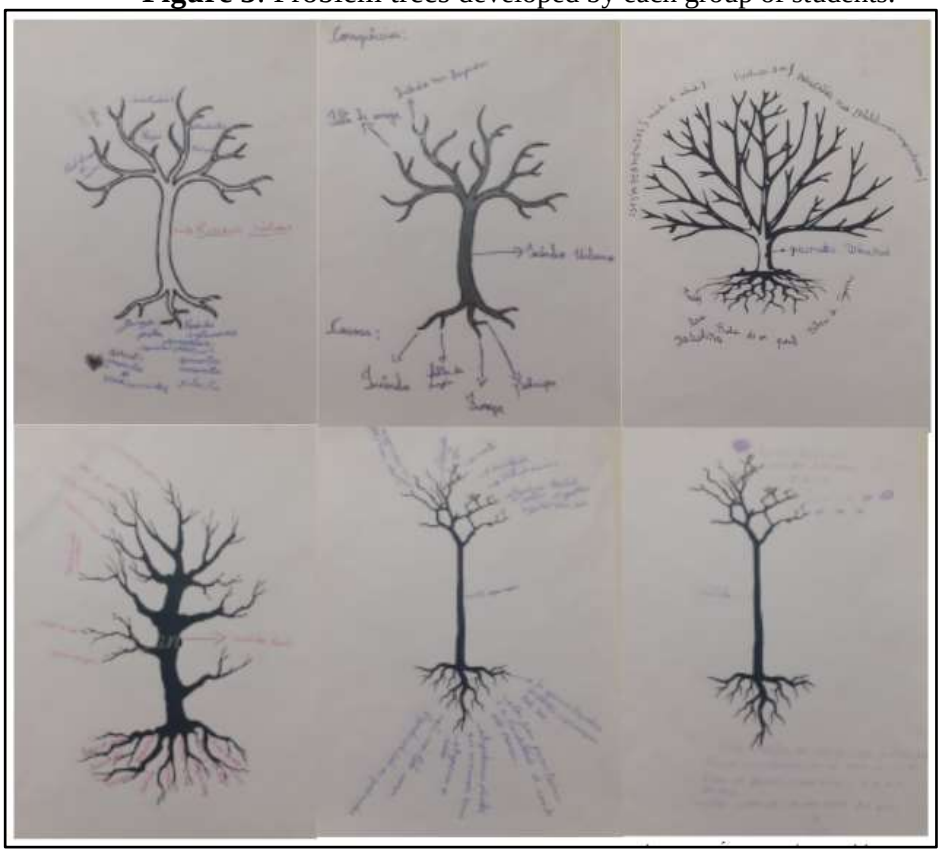
. **Source:** Prepared by the author, 2022.

The slide presentation was about the concepts: burning, prescribed burning, controlled burning, fire, forest fire, urban fire, hotspot, environmental education, landscape, ecology, ecodevelopment, and perception. The objective of the activity went through the learning of these concepts and possible forms of action in view of the problem of burnings and fires. The main causes and consequences of this problem were discussed, as well as satellite monitoring of hotspots, local legislation regarding the phenomenon, news, and actions developed locally, such as the "Say no to urban fires" campaign.

Furthermore, the importance of environmental education as a promoter of ecological awareness actions, the landscape as a unit of geographic space observation, perception as a propellant of critical thinking about socio-environmental problems, the study of the ecology concept aimed at the inter-relationship between organisms and the environment, and finally the ecodevelopment concept aimed at more sustainable practices and a development integrating the economic, social, cultural, spatial, and ecological spheres.

Afterwards, A4 sulfite sheets were distributed to each group already organized in previous classes. Each sheet showed the image of a tree having trunk, branches and roots, so the students could analyze the problem of burnings and fires, with the roots representing the causes and the branches, the consequences, as shown in figure 5.

Figure 5: Problem trees developed by each group of students.

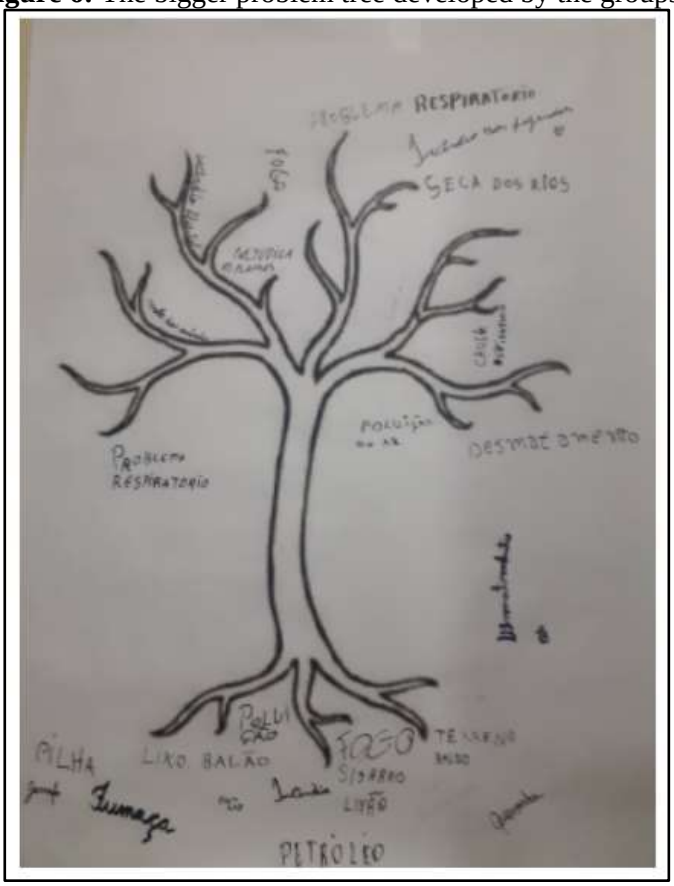


Source: Prepared by the author, 2022.

The trees distributed to the groups had as central themes: Urban fire, Solid waste, Fire, Burning, Urban burning and Forest fire. Among the causes listed by the students in their trees were: "cigarette butts", "glass bottles", deforestation", "wasteland", "flammable products", "batteries", "bottles", "incorrect disposal of medicines", "balloons", "garbage", "lightning", "hot air balloons", "gasoline". And among the consequences of these problems the students placed: "death of animals", "air pollution", "smoke causes respiratory problems", "river pollution", "respiratory health problem", "death of plants", "headache", "lack of energy", "pollution", "smoke", "diseases", "accidents", "erosion", "health problems".

In view of the notes taken by the students on their respective trees it is possible to observe that they perceive the impact of burnings and fires on the environment, either through pollution, erosive processes, death of animals, respiratory problems, death of plants, lack of energy when it occurs near the power grid, among others. And also realize that the causes can be either by human action through the improper disposal of waste such as cigarette butts, flammable products, bottles, medicines in vacant lots, or by natural action, such as lightning. Following this activity, each group was asked to put their answers on sheet A0 in order to build a bigger tree, containing all the answers listed in the smaller trees, so they could observe their answers and reflect about the problem, there is, about what could be done, what each individual and the community could do about this problem. The largest tree (figure 6) was built by all the groups together.

Figure 6: The bigger problem tree developed by the groups together.



Source: Prepared by the author, 2022.

In this way, the construction of a bigger tree went through the problematization of the theme: Burning and Fires in Campo Grande so that the students collectively observed all the causes and consequences raised in each group and thus could think about this problem in a more critical way, in view of its various causes and consequences. Associated to this, they reflected about this problem in the place where they live, what could be done, what actions could be taken with their families and other colleagues to prevent and fight against this problem, considering all its deleterious effects to human health and the environment.

CONCLUSIONS

The execution of this study in a school institution can be considered a successful experience, since it promoted simultaneous learning and teaching, providing students, teachers and researchers to know the numerous problems related to burning in the city of Campo Grande-MS. It instigated discussions in the formal educational environment, broadening the debate on strategies for actions that can synchronize the ideas of students, legislation, managers and agencies responsible for combating forest fires. The pedagogical tools produced from the local reality contributed in a relevant way to the formation of a critical citizen, enhancing the social construction on the occurrence of burning in the city of Campo Grande, enabling claiming priorities in the implementation of public policies and social cohesion with the space of everyday life, instigating the emergence of multipliers of good deeds and interlocutors for society. Furthermore, environmental education contributes to the awareness, prevention, and mitigation of

burnings and fires, awakening ecological awareness, the perception as a whole part and dependent on the environment, and more sustainable actions for the proper use of natural resources.

REFERENCES

BARBOSA, Maria Edivani Silva. Geography at school: space, time and temporalities. Magazine Teaching of Geography, v.7, n.12, 2016. Available at:http://www.revistaensinogeografia.ig.ufu.br/N12/Resumo-Art-7-Revista-Ensino-Geografia-v7-n12-Barbosa.php

BRAZIL.Constituição da República Federativa do Brasil de 1988. Available at:http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm

BRAZIL, 2012. Law nº12.608 of April 10, 2012. Institui a Política Nacional de Proteção e Defesa Civil.

CAMPO GRANDE; SEMADUR. Environmental legislation. Law nº2.909, of July 28, 1992. Institui o Código de Polícia Administrativa do Município e dá outras providências. Campo Grande, MS. Available at: https://www.campogrande.ms.gov.br/semadur/canais/legislacao-ambiental-leis-municipais/

DIOGRANDE. Law n.5.864 of September 13, 2017. Institui o Agosto Alaranjado. DIOGRANDE n.5000, Campo Grande-MS, 2017. Available at:https://diogrande.campogrande.ms.gov.br/edicoes/?palavra=&numero=&de=01%2F09%2F2017&ate=30%2F09%2F2017

DOE. Electronic official journal of the state of Mato Grosso do Sul. Decreto n°15.654, de 15 de abril de 2021. institui o Plano Estadual de Manejo Integrado do Fogo, e dá outras providências. Official newspaper of the state of Mato Grosso do Sul n°10.477. Campo Grande-MS, April 19, 2021. Available at: https://www.spdo.ms.gov.br/diariodoe/Index/Download/DO10477_19_04_2021

FREIRE, Paulo. Chapter 2: The banking conception of education as an instrument of oppression. Its assumptions, its criticisms. In:FREIRE, Paulo. Pedagogia do Oprimido, 17 ed. Rio de Janeiro, Paz e Terra, 1987.

HAMANN, Bruna; LOPES, Maurício Capobianco; TOMIO, Daniela; VIEIRA, Rafaela. Educational practices for prevention and mitigation of disaster risks. Expressa Extensão. ISSN 2358-8195, v.24, n.3, p.197-208, 2019. Available at:https://periodicos.ufpel.edu.br/ojs2/index.php/expressaextensao/article/view/16266

INPE. Burning database. Focuses by country. Inpe, 2020. Available at:https://queimadas.dgi.inpe.br/queimadas/bdqueimadas#graficos

KOZEL, Salete. Mental maps. Dialogism and representation. Appris editora, Curitiba-PR, 2018. 62p.

MATSUO, Patricia Mie; SILVA, Rosana Louro Ferreira. Disasters in Brazil? Practices and approaches in risk and disaster reduction education. Scielo, Dossier: Environmental education and the basic school: contexts and practices. Education in Review, 2021. Available at:https://www.scielo.br/j/er/a/PJhCj6DSvLcTGM4yGFxmJFj/

MINISTRY OF EDUCATION - MEC, 2017. Resolution CNE/CP No. 2, of December 22, 2017. Institui e orienta a implantação da Base Nacional Comum Curricular - BNCC.

MORIN, Edgar. The seven knowledge necessary for the education of the future. Translation by Catarina Eleonora F. da Silva and Jeanne Sawaya. Technical revision by Edgard de Assis Carvalho. 2 ed. São Paulo:Cortez; Brasília, DF:UNESCO, 2000. 115p.

PLANURB. Report of environmental education actions in the municipality of Campo Grande-MS: Diga não às Queimadas Urbanas Campaign: August Orange, 2019. Campo Grande-MS, 2020. Available at:http://www.campogrande.ms.gov.br/planurb/meio-ambiente-documentos/.