

THE WISDOM OF THE WATERS, THE FIRMNESS OF THE LAND: GENDER PERSPECTIVES ABOUT PANTANAL BIOME CHANGING

A SABEDORIA DAS ÁGUAS, A FIRMEZA DA TERRA: PERSPECTIVAS DE GÊNERO EM UM PANTANAL EM MUDANÇA

LA SABIDURÍA DE LAS AGUAS, LA FIRMEZA DE LA TIERRA: PERSPECTIVAS DE GÉNERO EM UM PANTANAL EM TRANSFORMACIÓN



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ABSTRACT

This study analyzes the perceptions of women from the Pantanal region (farmers, fisherwomen, and bait makers) regarding climate change in the sub-Pantanal areas of Aquidauana, Miranda, and Nhecolândia (MS). Through a qualitative approach, with a literature review and questionnaires administered to nine women, the results show that changes in climate and landscape, such as increased heat, altered water regimes, and decreased biodiversity, are clearly perceived and already impact their ways of life. Intersectional analysis demonstrates that these effects disproportionately affect women, intensifying their workload, reducing their economic autonomy, and threatening traditional knowledge. It concludes that the environmental crisis deepens gender inequalities, requiring public policies that adopt an intersectional perspective, recognize women's knowledge, and guarantee their active participation in environmental governance to build climate justice in the Pantanal.

Keywords: Climate Change. Rural Women. Intersectionality.

RESUMO

Este estudo analisa as percepções de mulheres pantaneiras (fazendeiras, pescadoras e isqueiras) acerca das alterações climáticas nos sub-pantaneais de Aquidauana, Miranda e Nhecolândia (MS). Por meio de abordagem qualitativa, com revisão bibliográfica e aplicação de questionários à nove mulheres, os resultados evidenciam que as alterações no clima e na paisagem, como aumento do calor, alteração no regime hídrico e diminuição da biodiversidade, são claramente percebidas e já impactam seus modos de vida. A análise interseccional demonstra que esses efeitos recaem desproporcionalmente sobre as mulheres, intensificando sua carga de trabalho, reduzindo sua autonomia econômica e ameaçando saberes tradicionais. Conclui-se que a crise ambiental aprofunda desigualdades de gênero, exigindo políticas públicas que adotem uma perspectiva interseccional, reconheçam o conhecimento das mulheres e garantam sua participação ativa na governança ambiental para a construção de justiça climática no Pantanal.

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Palavras-chave: Alterações Climáticas. Mulheres Rurais. Interseccionalidade.

RESUMEN

Este estudio analiza las percepciones de las mujeres de la región del Pantanal (agricultoras, pescadoras y carnívoras) respecto al cambio climático en las áreas subpantanales de Aquidauana, Miranda y Nhecolândia (MS). Mediante un enfoque cualitativo, con una revisión bibliográfica y cuestionarios aplicados a nueve mujeres, los resultados muestran que los cambios en el clima y el paisaje, como el aumento de la temperatura, la alteración de los regímenes hídricos y la disminución de la biodiversidad, son claramente percibidos y ya impactan sus modos de vida. El análisis interseccional demuestra que estos efectos afectan desproporcionadamente a las mujeres, intensificando su carga de trabajo, reduciendo su autonomía económica y amenazando los conocimientos tradicionales. Concluye que la crisis ambiental profundiza las desigualdades de género, lo que requiere políticas públicas que adopten una perspectiva interseccional, reconozcan el conocimiento de las mujeres y garanticen su participación activa en la gobernanza ambiental para construir justicia climática en el Pantanal.

Palabras clave: Cambio Climático. Mujeres Rurales. Interseccionalidad.

1 INTRODUCTION

Global climate change is at the heart of this scientific investigation due to its impacts on the dynamics of the terrestrial biosphere, with special attention to the Pantanal biome, which, in the South American context, already reflects the significant changes in weather patterns experienced by Brazil, such as the increase in temperatures and the change in rainfall patterns, which directly affect its biomes and populations. In this scenario, the Pantanal, a transboundary floodplain in the Upper Paraguay Basin, stands out as a unique and sensitive system, recognized as a Biosphere Reserve and Ramsar Site, whose dynamics are governed by the cycles of flood and drought that sustain its exceptional biodiversity and vital ecosystem services for resident communities (GONÇALVES; ANDRADE and SILVA, 2024).

However, this biome faces **increasing anthropogenic pressures in and around it** (agribusiness, deforestation, urban expansion) that, synergistically with **global climate change** (such as more intense and prolonged droughts), **put the system at risk of socio-environmental collapse**. Since the convergence of these factors compromises the ecological resilience of the biome, amplifying the threats to its biodiversity and the functional integrity in the maintenance of resident traditional communities (GONÇALVES; ANDRADE and SILVA, 2024).

Consequently, the social subjects and the object of study of this scientific research are those individuals who have their subsistence and way of life, directly linked to nature. In this case, specifically: the farmers, professional fishermen and the "lighters", who live and work in the sub-Pantanal of Aquidauana, Miranda and Nhecolândia, respectively in the municipalities of Aquidauana, Miranda and Corumbá, in Mato Grosso do Sul.

These were chosen in an intentional random way, due to their social, anthropological characteristics and, above all, existential connections with the Pantanal biome, since they make up groups vulnerable to climate change. Therefore, it is social subjects and communities that are/will be increasingly affected by climate change and global warming (SPACKI, et. all., 2015).

Thus, properly understanding their perceptions about these phenomena builds an important reference for the formulation of public policies and measures to adapt to the climatic conditions to which these actors are/will be exposed over time (GONÇALVES and SOCORRO, 2024).

The main objective of this article is to establish a case study on the social perceptions of "Pantanal" women. As already mentioned: the farmers, professional fishermen and the "lighters", who live and work in the sub-Pantanal of Aquidauana, Miranda and Nhecolândia,

respectively in the municipalities of Aquidauana, Miranda and Corumbá, in Mato Grosso do Sul, about climate change and how it already impacts their ways of life.

2 THEORETICAL FRAMEWORK

The imbalances between economic development and environmental degradation compromise ecosystem services and the self-regulation of nature. To conserve the natural heritage, measures are needed that reconcile human beings and natural systems. In this context, gender equality is fundamental to face contemporary socio-environmental problems (MORTALE; MOREIRA and NEIMAN, 2020).

Historically, the sexual division of labor has limited women's participation in environmental discussions and sustainable development. Thus, it is necessary to recognize their role in reducing unsustainable consumption patterns and combating hierarchical inequalities, expanding the debate and incorporating their participation, in an effective and legitimate way (ÁVILA and RIBEIRO, 2017).

Despite the greater visibility of women's struggles, the inclusion of women in environmental policymaking is still slow, requiring new approaches that consider intersectional relationships. Just like ecofeminism, which emerges as a movement that relates the oppression of women to the exploitation of nature, criticizing patriarchy and capitalism. This movement seeks to deconstruct hierarchical dualisms (man/woman, culture/nature) and value traditional feminine knowledge (RANZI and BOSSLE, 2022).

Therefore, this intersectional analysis provides us with the essential theoretical framework for us to understand how social markers (gender, ethnicity, social extract, territoriality, etc.) are interconnected, producing differentiated experiences of vulnerability and resistance in the face of specific phenomena. In this case: climate change in the Pantanal biome.

In turn, in this socio-environmental context, we can still indicate that there is an intertwining with feminist political ecology, an approach that examines and proposes how gender-based power relations shape access, use and control over natural resources (CASTRO and ABRAMOVAY, 2005).

Specifically, with regard to the impacts of climate change in relation to the gender issue, we can indicate that these are not neutral or symmetrical. Since they burden women with additional work to ensure family subsistence.

In the Pantanal biome, these dynamics are manifested in traditional communities, where women are often the bearers of specialized knowledge about the local biodiversity, seasonality, and subsistence practices of each territory (RONDON, 2025).

3 METHODOLOGY

This is an applied research, of qualitative character and its development took place through the conscious, technical and synergistic use of various scientific procedures, which promoted the appropriate support for the investigation and interpretation of the object of study and the associated phenomenon.

Preliminarily, secondary data were obtained through bibliographic exploration (MARCONI and LAKATOS, 2021). At this stage of the research, the essential keywords were: climate change; global warming; Pantanal. These terms were consulted in repositories of recognized universities and databases, such as: CAPES Journals, *Google Academic* and Scopus.

In this process we analyzed: books, scientific articles (national and international), doctoral theses, master's dissertations, as well as technical texts from international organizations, government agencies, research centers and non-governmental organizations (NGOs), which dealt with the themes of our scrutiny.

Then, with regard to the collection of primary data, the calculation in locus took place in September 2023, in Miranda (sub-Pantanal of Miranda), and, in May 2024, in Aquidauana and Corumbá (Sub-Pantanal of Aquidauana and Nhecolândia).

These actions have the fundamental characteristic of geographic research, being an empirical and descriptive observation. In this sense, in order to properly perform this technical procedure, the researcher adopted the behavior of an external observer, capturing and recording the information coming from the "object under analysis", which is a neutral agent, only systematizing the perception about the phenomena revealed to him by the social subjects, holders of knowledge about the phenomenon examined (SUERTEGARAY, 2002).

In these actions, dynamic questionnaires were applied (ADOLFO, 2021), structured as open and closed questions. The combination of these questions sought to generate primary data so that we can understand the profile of the social subjects interviewed and their environmental perception (AP) about climate change in these places and, also, what are the implications in their daily lives.

It should be noted that, on the subject of environmental perception, it is pertinent to argue that this perspective unifies psychological, geographical, biological, and anthropological understandings, aiming at a better understanding of the factors, mechanisms, and processes that motivate the social subject to have perceptions and behaviors in relation to their environment (GONÇALVES and SILVA, 2025).

It should be noted that we focused on addressing 05 (five) general aspects in this survey: I) general perception of the climate; II) general perception of the territory; III) general

perception of rivers; IV) general perception of deforestation and, V) in a direct and open way: "Is the climate changing? How does it affect you?".

The sampling of this research was based on the conceptual perspective called: "snowball". This is a form of non-probabilistic sample, which uses reference chains or traditional social networks (VINUTO, 2014). In this case, the sample was composed of 09 (nine) women, 03 (three) from each sub-Pantanal.

The process of analyzing the data collected and described throughout the research and, likewise, its results, follow the inductive method (MARCONI and LAKATOS, 2021).

4 RESULTS AND DISCUSSION

The field research interviewed 09 (nine) traditional residents of the Pantanal biome, 07 fisherwomen and/or "isqueiras" (live bait collectors) and 2 farmers (extensive traditional livestock). All female (09), between 25 and 59 years old and have lived in the region for more than 20 years.

The delimitation of this focus group, made up only of women, is not only a methodological coincidence, but a cut that reveals a crucial dimension of the relationship with the territory. Social identities such as gender, class, and ethnicity overlap, creating specific modes of experience.

In this case, the gender of these women is intertwined with their identity as workers and guardians of a specific biome, positioning them on a singular front line in the face of climate change and changes in the landscape of the biome. Their environmental perceptions are the result of this intersection, in which traditional ecological knowledge is mediated by social and labor roles related to gender (MOURO, 2017).

Consequently, the interviewees report significant environmental and climate changes in the last three decades. The intensity of the heat, windstorms, smoke, dust, fires and silting of the rivers increased. Deforestation is more noticeable today. The intensity of the cold and rainfall decreased; the cleanliness, volume and regularity of river flooding; the abundance of fish and the ease of fishing or collecting bait.

This perspective on the loss and degradation of environmental resources is not just an environmental inventory. They are the social and historical record of a destabilization of the subsistence economy, often supported by women.

In this case, the decrease in fish abundance and the alteration of the water regime directly impact fishing resources, on which these women and their communities depend for their economic autonomy and cultural reproduction, reinforcing the thesis that the exploitation of nature and the subordination of women are interconnected.

Thus, we can understand that these changes are directly impacting the technical and economic feasibility of traditional activities. Regarding the professions of fisherwoman and/or "lighters", these have become less profitable, requiring more time and resources for an increasingly smaller financial return.

The impact here is intersectional, since it is not only a generalized economic crisis, but a crisis that affects a work marked by gender. The longer working hours specifically burden these women, who often reconcile productive activity with domestic and family "responsibilities". Environmental degradation thus intensifies pre-existing gender inequalities, increasing women's workload and reducing their financial independence (FLORES and TREVISA 2015).

Regarding the occupation of farmer (traditional cattle rancher), climate change impacts the amount and seasonality of rainfall, harming pastures and cattle nutrition, requiring food supplementation and significantly increasing the costs of the operation. In this case, intersectionality manifests itself in the challenge of managing an activity historically associated with male power in a context of increasing environmental precariousness.

Therefore, the pressure on these women goes beyond the economic sphere, it is also a pressure on their legitimacy and management capacity in a sector dominated by men. Vulnerability is not neutral and is amplified by the intersection between being a woman and running an enterprise in a traditionally patriarchal sector and now under severe ecological stress.

In both situations, the scenario discourages the new generations and, therefore, threatens the continuity of these ways of life. This threat to continuity is the materialization of the concept of intersectional environmental injustice. It is not only the environment that is degraded, but a specific social and cultural fabric, sustained by women's knowledge and practices, that unravels (RONDON and GRUBITS, 2024).

The migration of the younger generations, from the countryside to the city, represents a break in the transmission of traditional knowledge held by these women, further deepening the loss of biodiversity and socio-environmental resilience. In this case, the threat is twofold: the Pantanal culture and the central role of women in its preservation.

5 CONSIDERATIONS

This study corroborates, from the direct listening of the protagonists, that climate change and anthropogenic transformations in the Pantanal landscape are already a reality lived and perceptible by traditional communities, confirming and giving concreteness to scientific projections.

The reports of the interviewees, which show the intensification of droughts and heat, the alteration of the water regime, the silting of rivers and the decline of biodiversity, do not merely describe an environmental change, but an **accelerated process of socioeconomic and cultural destabilization**.

The intersectional analysis carried out revealed that the impacts of these climate changes are **differentially distributed and intensified by the condition of gender**. For fisherwomen, "lighters" and farmers, the environmental crisis translates into longer working hours, reduced income, loss of economic autonomy and increased pressure on their legitimacy in historically male workplaces.

The degradation of the Pantanal is not a neutral phenomenon, it **reinforces pre-existing inequalities**, specifically burdening women and threatening the continuity of the traditional ways of life and knowledge they sustain.

In view of this evidence, the need for **urgent and contextualized public policies** for the region becomes indisputable. However, our results demand that such policies transcend a homogeneous view of "traditional populations". It is imperative that the State adopts an **explicit intersectional lens**, capable of:

1. **Recognize and value** the traditional ecological knowledge held by women, incorporating it as a basis for climate adaptation strategies;
2. **Ensure equal governance spaces** that ensure the active participation of Pantanal women in the formulation and implementation of policies for the biome;
3. **Promote the economic autonomy** of these women, fostering sustainable alternatives that strengthen their resilience in the face of climate change.

Finally, protecting the biome necessarily means protecting and empowering the women who live in it. The sustainability of the Pantanal biome depends on the ability to listen to and integrate the voices and knowledge of these women and their communities, transforming their keen perception of climate change into a fundamental foundation for collective action and the construction of a socially and ecologically resilient territory.

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