International Journal Semiarid

ALLOTMENT IN RISK AREAS

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ABSTRACT:
The inappropriate use of areas located in the Aquidauana River has become a recurrent issue with episodes of urban flooding. This work aims to analyze the impacts causedduring periods of flooding in the city of Aquidauana. The expansion of urban space has gradually contributed to the advancement of socio-spatial vulnerability, thus favoring the incidence of extreme episodes. The disorderly and accelerated growth of cities, associated with population concentration and irregular planning support, has caused a variety of transformations in the urban environment. Such as the environmental impacts caused by the residents who are in these places, with garbage disposal in inappropriate places, removal of riparian forest, river water pollution with open-air dumping of sewage. To achieve the objectives of this theme, cartographic work, bibliographic review and historical data collection were carried out.
Keywords: Urban Space; Floods; Aquidauana River.

LOTEAMENTO EM ÁREAS DE RISCO

RESUMO:
O uso inadequado de áreas localizadas no Rio Aquidauana, vêm tornando-se assunto recorrente com episódios de inundações urbanas. Este trabalho tem por objetivo analisar os impactos causados nos períodos de inundações na cidade de Aquidauana. A expansão do espaço urbano, gradativamente tem contribuído para o avanço da vulnerabilidade socioespacial favorecendo assim, na incidência de episódios extremos. Ocrescimento desordenado e acelerado das cidades, associado à concentração populacionale suporte de planejamento irregular tem provocado uma diversidade de transformações no ambiente urbano. Como os impactos ambientais causados pelos moradores que se encontram nesses locais, com descartes de lixos em locais inapropriados, retirada da mata ciliar, poluição das águas do rio com despejamento de esgoto a céu aberto. Para alcançar os objetivos dessa temática foram realizados trabalhos cartográficos, revisão bibliografias e coleta de dados históricos.
Palavras-chave: Espaço urbano; Inundações; Rio Aquidauana.

INTRODUCTION

The study aims to explain the impacts caused by anthropic actions on the dynamics of water in the region, instigating an understanding of the aspects of threat, danger, vulnerability, damage and injury that are presented as the main components of arisk area.

In the cities of Aquidauana and Anastácio, runoff from precipitation occurs over the sub-basins of the Aquidauana River. The channel, in its cross section, when it reachesthe urban perimeters, is silted up and cannot cope with the excessive flow of water, overflowing its excess towards the larger bed, which is unduly occupied by anthropic action.
Silva and Joia (2001) report that the significant subdivision of the banks of the Aquidauana River began in January 1956 in the west to east direction of the city in the area from Praça Nossa Senhora da Imaculada Conceição to the former Rua 13 de Junho,

today called Rua Francisco de Castro. However, the municipal government itself, at the time, allowed the deforestation of the area, authorizing the subdivision in this area.
The inadequate use of areas located in the Aquidauana River has become a recurring issue with episodes of urban flooding, who live in risk areas formed by the Aquidauana River basin, becoming susceptible to natural risks.

Another anthropic cause is the irregular occupation of areas subject to greater flooding, caused mainly by lack of planning in the cities. These occupations generate disasters as we have seen in our region. The consequences of flooding are drastic and have caused economic and environmental damage to the citizens of the affected region, in most cases to the families living along the river banks.

The urban network of Aquidauana (right bank) has registered a higher number ofincidents related to hydrological risks, since the population agglomeration in this area is much higher than in the urban area of Anastácio, on the left bank. The water of the Aquidauana River covers the headwaters of the two bridges that provide access to Aquidauana and Anastácio, which are isolated.

In this context, the understanding of the risks that the population suffers in the riverside areas or floodplains is extremely important for urban planning and prevention actions, and through that the main objective of this work is to analyze the impacts causedby irregular occupations in the floodplain of the urban areas of Aquidauana and Anastácio, state of Mato Grosso do Sul, their environmental and social effects and respective innovative alternatives that subsidize the improvement of urban environmental management and quality of life for the population.

The main objective of this work is to analyze the impacts caused by irregular occupations in the floodplains of the urban areas of Aquidauana and Anastácio, state of Mato Grosso do Sul, their environmental and social effects and respective innovative alternatives that support the improvement of urban environmental management and quality of life of the population.

The expansion of urban space has gradually contributed to the advancement of socio-spatial vulnerability thus favoring the incidence of extreme episodes.
Since then, it has been possible to observe the transformations that have occurred over more than a century of existence, in the adjacencies of the Aquidauana River (riparian area), such as the irregular occupation of these people on the banks, bringing as consequences the invasion of these flood waters in the houses built around the riverbank. According to Tucci (2008), the pollution of Brazilian water resources causes diseases carried by these resources and consequently deterioration of the natural environment. Still on diseases, TUCCI. (2008, p. 7) explains:

> Waterborne diseases can occur due to: a) the lack of safe water supply for the population, which involves water supply. In this case diarrhea is the most common disease. [...] b) diseases that depend on people's hygiene, related to education; c) diseases

related to the environment and the disposal of water, such as malaria, dengue and schistosomiasis, among others; d) flood-related diseases such as leptospirosis, which is the contamination of rat urine in flood water.

Figura 1 – Localização

Fonte: Ana Flavia A. Honorato 2014.

BACKGROUND

In the cities of Aquidauana and Anastácio, runoff from precipitation occurs over the sub-basins of the Aquidauana River.

Flooding in urban areas represents a serious problem for Brazilian cities, causing considerable and irreparable damage to the population. There are factors that are certainly associated with this damage, one of the most worrying is the "Machiavellian" planning that intentionally reserves the worst places in the city for the poor.

The poor the worst places in the city in an intentional manner for occupying watersheds. The population with the highest purchasing power tends to inhabit the safestplaces, unlike the population without financial resources that occupies the areas with highflooding rates, causing social problems that are repeated almost every year in the cities.

The problems caused by floods and, therefore, the intensity of the risk of these events these events, depends on the degree of occupation of the areas marginal to the channels and the frequency with which the phenomenon is repeated, that is, the return time (SOUZA, 1996).

However, when man occupies the watershed, inserting buildings in areas near therivers and their banks that are naturally susceptible to excessive water flow, flooding becomes a greater risk.

The maintenance and conservation of the APPs (Permanent Preservation Areas) contribute in a fundamental way to the reduction of environmental risks and the vulnerability of urban populations. The disorderly occupation of riverbank areas, togetherwith other factors such as the inadequate sealing of the soil's rainwater, accentuates the problem both in large cities and in smaller cities in the interior. In this situation, the waterthat would be absorbed by the soil and natural vegetation floods urbanized areas that haveno protection whatsoever, causing serious damage to the population. Thus S.e J. (2001, p.24) state that "the then mayor Mr. Fernando Luiz Alves Ribeiro, through the Secretariat of Transportation and Public Works, drew up a plan for the subdivision of the entire riverbank, with the denomination of Zona Ribeirinha", authorizing the subdivision of the Area of Permanent Preservation of the Aquidauana River. This occupation started from the Praça Nossa Senhora da Conceição in the direction of Ilha dos Pescadores, in the Guanandy neighborhood, west-east of the urban area.

The preservation of the marginal areas of water bodies reduces the risk offlooding. In this sense, the implementation of measures and preservation of Permanent

Preservation Areas - APP, (a protected area, covered or not by native vegetation, with the environmental function of preserving water resources, landscape, geological stability and biodiversity, facilitate the gene flow of fauna and flora, protect the soil and ensure the welfare of human populations that are provided for in Brazilian legislation by the Forest Code (Law 12. 651, of 2012) and vary between 30 meters and 500 meters, depending on the width of each, counted from the largest bed) must be preserved from anthropic occupation in order to conserve water resources and landscapes in areas that show greater environmental fragility, so that they contribute in a fundamental way to reducing environmental risks and the vulnerability of urban populations.

Figura 2- Inundações do Rio Aquidauana nas áreas urbanas dos municípios de Aquidauana e Anastácio (MS), nos anos 1990, 2013 e 2016.

Fonte: Prefeitura Municipal de Aquidauana (2016).

MATERIALS AND METHODS

The study presented was developed from bibliographic consultations, such as books, theses, dissertations, articles, among others, seeking a theoretical reference for theresearch and also to obtain an analysis and a more detailed diagnosis about the area, seeking to analyze documentary news, field visits to observe the characteristics of the place, as well as the damage caused by the flooding of the Aquidauana River, thus providing a contribution to the analyses with scientific bases, which discuss about observing the place of study to understand the impacts caused.

To study the impacts caused by human actions in question is the focus of this research, which sought, through news from the newspaper "O Pantaneiro", "Correio do Estado" and bibliographies related to this event to understand the urban space and how it absorbs the impacts caused by precipitation, and the historical characterization of the study area through its structuring and historical formation.

The surveys were collected by the Brazilian Institute of Geography and Statistics (IBGE, 2021), as well as state and federal government agencies and private companies.

LITERATURE REVISION

Planning for the urbanization process is essential, but some fundamental aspects have not

been considered, which end up bringing inconvenience and costs to society and the environment. In the city of Aquidauana, this reality is no different, since the subdivision took place in an inadequate way, like a typical riverside city, which lived its first moments due to river transport.

SANTOS (2006, p. 02) emphasizes that water is the most precious asset of the Earth's natural heritage, classified as an essential substance for the continuity of life, a fundamental input for almost all human activities and responsible for the balance of the environment. It is in constant motion, the so-called Hydrological Cycle.

Generally, many families who live in these places are homeless in both cities (Aquidauana and Anastácio). CARLOS (2007) assures that understanding the historical origin of the city is fundamental, as it means understanding the city as the spatialization of social relations, as a product, condition and means of the reproduction process of a dynamic society.

The cities of Aquidauana and Anastácio suffer from the damage caused by the floods, and in recent years residents who occupy the edge of the Aquidauana River wereaffected every year, since there were no intervals of recurrence in the floods, with only a change in spatiality. of events.

According to FERNANDES (2015, p. 13), who describes:

> Disasters associated with floods, inundations and flooding result in material and human damage, such as the destruction of houses and crops; drowning deaths (of humans and animals); commitment of essential services, such as basic sanitation, electricity distribution, transport, communications; intensification of accidents by venomous animals; dissemination of diseases transmitted by contaminated water and food (diarrheaand hepatitis, for example); in addition to the occurrence of acute respiratory infections. (FERNANDES, 2015, p. 13).

Human interference on water courses has been causing floods and inundations, which occur in different ways. Almost always, this issue is linked to the installation of economically and socially disadvantaged families, thus occurringdifferentiation of social classes, as was the case of the subdivision on the banks of this river, with population growth, this division of the area attributed to people with low and underprivileged financial conditions, thus causing the housing of these families in these risky places.

Environmental impacts such as floods and erosion processes can be aggravated by human action, becoming agents responsible for disasters, which cause damage to life, economic and environmental damage (MACHADO; TORRES, 2012).

A problem that does not seem to have a quick solution is the high level of pollution, caused both by the lack of awareness on the part of the population and by inefficient systems of garbage collection or distribution of garbage cans throughout the city. Furthermore, there are problems caused by pollution generated by companies and other

bodies, which is also the case in our city, and by poor planning in urban space.

According to T. (1999) as the basin is urbanized, and densification is consolidated, the production of sediments may reduce, but another problem appears, which is the production of garbage. Garbage further clogs drainage and creates even worse environmental conditions. This problem is usually only minimized with adequate collection frequency and heavy fines.

The absence of basic sanitation, environmental education has been one of the potential agents of these cases of risk, the waste generated is carried away by the floods and contributes even more to the spread of diseases and clogging of the mouth of wolves that should have the function of guaranteeing the flow of water and prevent solid materials, retained during the rains, from obstructing water drainage.

T. (2005) highlights some problems related to water infrastructure in the urban environment, such as: lack of sewage treatment; increase in solid waste thrown into rivers; loss of water quality; lack of implementation of urban drainage network; occupation of the riverine flooded area; waterproofing and channeling urban rivers; the last three being the ones that greatly contribute to the increase in the flood flow of rivers, which associated with the occupation of risk areas, provide natural disasters resulting from floods.

Another main factor contributing to flooding in these areas is the waterproofing of the soil, which increases surface runoff and decreases infiltration.

Of rainwater associated with an ineffective drainage system that cannot drain all the water into it, when the vegetation is removed, which makes up the surrounding the river, can intensify the erosion process, as it would have the function of retaining part of the sediments that go to the bed, this practice has serious implications for the natural environment of the river.

According to T. (2009) waterproofing is one of the main causes of floods and landslides in urban areas, as its effect reduces green areas, reducing the ability to infiltrate water into the soil and increasing the flow capacity, due to the adoption of conduits. and surfaces that facilitate the rapid movement of water.

Over the years and the population increase, the riverside area of the municipalities of Aquidauana and Anastácio was de-characterized. “The valley bottoms, as in the case of those located in the urban fabrics of Anastácio and Aquidauana, are all occupied, the riparian forest has been suppressed and, to a large extent, they are waterproofed by roads, houses and backyards” (FERNANDES, 2015, p. 29).

Coelho (2001) states that: Environmental Impact is, therefore, the process of social and ecological changes caused by disturbances (a new occupation and/or construction of a new object) in the environment. It also concerns the joint evolution of social and ecological contradictions, stimulated by the impulses of the relations between external and internal forces to the spatial and ecological unit, historically or socially determined. It is the relationship between society and nature that is differentially and dynamically transformed. Environmental impacts are written in time and affect differently, altering the structures of social classes and restructuring space. (COELHO, 2001, p.25).

The urban network of Aquidauana (right bank) has registered a greater number ofincidents related to hydrological risks. During the flood season, water from the Aquidauana River covers the headwaters of the two access bridges to Aquidauana and Anastácio that are isolated. With this, it is necessary to build an improvised pedestrian crossing, which becomes the only way to reach the city.

Figura 3 - Passadeira construída na entrada da ponte nova

Fonte: Equipe do Exército construiu passarela para garantir ao menos o acesso de pedestres ao município(Foto: Divulgação/Exército) - CREDITO: CAMPO GRANDE NEWS, 2018

RESULTS AND/OR DISCUSSIONS

The occurrence of disasters is related to the social vulnerability of certain groups in the urban space, especially those located in peripheral areas and/or in risk areas. Social vulnerability is linked to poverty and the exclusion of the individual, who seems to be invisible to public bodies, which only notice their presence in disaster situations, and in these circumstances, they attribute such events to fatalities, outside of these events they are ignored, excluded and without any prospect of social assistance.

It is necessary to develop educational activities for residents to engage in the protection of APPS (Permanent Preservation Areas) in order to preserve these areas; promote discussions that can disseminate the preservation of the river bed; carry out actions with the riverside community to recover the floodable areas along the river, mainly to enforce and modernize these public policies that are so lacking in our state. The State lacks the

application of public policies, inspection and implementation of new measures.

It is necessary for the public power to implement new public policies aimed at improving the quality of life of the riverside people, since this population has been suffering for years with the effects of the flood and, even so, is not aware that the best option would be locomotion to a safe area of the city close to the river, but away from itsbanks.

The cities of Aquidauana and Anastácio are located in a transition area between the Maracaju – Campo Grande plateau and the sedimentary plain of the Pantanal. The lack of urban planning in the riverside area increases the risk of flooding and, in this way,reaching homes causing material damage and the health of residents.

It is necessary that the public power implement and apply new public policies thataim to improve the quality of life of the riverside people, since this population has been suffering for years with the effects of the flood and, even so, it is not aware that the best option would be the locomotion to a safe area of the city close to the river, but away fromits banks.

The place where the riverside population lives, in addition to the environmental and geological risks that the residents face as it is an area of flooding, the degradation ofthe environment and the pollution of the river and its tributaries. The homes do not havebasic sanitation infrastructure, nor sewage network.

The study of space and occupation in the urban area is extremely important for the understanding of floods. His analysis deals with issues related to the removal of riparian vegetation, waterproofing processes, irregular sewage installations being released into the waters by the population living close to it and the impacts caused by these irregular dwellings. Inadequate land use causes the populations that inhabit these areas consideredto be river floodplains to suffer serious consequences in terms of health and quality of lifeat the time of the floods.

At first, the negative impacts were low, but they were accentuated over time, C. (2001) mentions that urbanization transforms society and the environmental impacts arepromoted by urban agglomerations, at the same time that they result from the transformation of the natural characteristics and social classes. Therefore, the acceleratedand disorderly pace has caused the most diverse environmental impacts, as well as variousconflicts of a social, land and institutional order.

Among the impacts resulting from accelerated urbanization, the increase in housing precariousness and social differentiation stands out, which, according to Grostein (2001), generates socio-environmental problems and risk situations, which affect both thephysical space and public health, as : disasters caused by erosion, floods and landslides; indiscriminate destruction of forests and protected areas; contamination of the water table and water supply dams; epidemics and diseases caused by humidity and lack of ventilation in makeshift housing or by sewage and wastewater that circulate in the open,among others.

The occurrence of disasters is related to the social vulnerability of certain groups in the urban space, especially those located in peripheral areas and/or in risk areas. Social vulnerability is linked to poverty and the exclusion of the individual, who seems to be invisible to public bodies, which only notice their presence in disaster situations, and in these circumstances, they attribute such events to fatalities, outside of these events they are

ignored, excluded and without any prospect of social assistance.

In this sense, it is necessary that man has a look and a better perception of environmental issues, to pass on to the subject the notion of collective, of preservation, making everyone responsible for their attitudes, providing actions that will be carried out and that will be viable. for a better environmental condition. It is necessary for the government to implement new public policies and supervision aimed at improving the quality of life of riverside dwellers since this population has been suffering for years with the effects of the flood. The place where the riverside population lives, in addition to the environmental and geological risks that the residents face as it is a flooded area, suffers from the degradation of the environment and the pollution of the river and its tributaries. The residences do not have basic sanitation infrastructure or sewage system.

Figura 4 – Esgoto lançado no rio Aquidauana, proveniente de áreas urbanas dos municípios de Aquidauana e Anastácio – MS.

Fonte: Ximenes, L.S.V. (abril de 2015).

CONCLUSION

Urban expansion is one of the aggravating factors in the process of environmental degradation. The accelerated growth of cities, associated with population concentration, has caused a diversity of transformations in the urban environment, the waterproofing of the soil, the disorderly occupation of the river banks, the increase in the level of the Aquidauana river and the deficient drainage system are factors that contribute to intensify the occurrence of floods in the city.

The physical aspects of the relief and the hydrographic basins in the city of Aquidauana,

combining the principles of protection and civil defense and environmentaleducation, lack the execution and continuous inspection, so that the laws of our environment are executed and respected. The conditions of land use and occupation and the geological and geomorphological aspects associated with changes in the urban landscape have shown negative impacts on urban space.

The flow of water in this cross section, when overflowing towards the larger bed,finds the urban space fractured, with differentiation in its form and function. The ‘‘in loco’’ visits showed that the negative impacts are spread across several places in the floodplain. Such as residential sewage being thrown directly into the riverbed and septictanks built in humid areas, waste produced in homes discarded in inappropriate places and mainly the lack of riparian forest. It can be seen that the flood waves have transporteda lot of sediment to the banks of the river, which are with minimal degrees of uniquenessof the original vegetation, intervening even more in the biodiversity of the area that has been threatened by the constant landfills.

The lack of proper urban planning is the main factor that interferes in the incidence of the problem, where the occupation of inappropriate places for housing and housing, the reduction of green areas, the waterproofing of the soil, both concrete and asphalt. In another aspect, many traditional families, to the east, also owned residences and farms on the banks of the Aquidauana River. Because not everyone has the privilege and conditionsto live in places where this phenomenon does not occur, that is, not everyone has the economic conditions to have chosen their place of residence and privileged subdivision. “It is in social work that men establish relationships among themselves and, based on these, with nature” (CORRÊA, 1998, p.54). The organization of society in space occurs unevenly, as a result of history and spatial organization. A civil defense strategy is recommended to minimize damage, define actions such as reforestation, environmental education, integrated management of the rainwater drainage network.

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