

## **Water Resources In The Hydrographic Basin of The Meia Ponte River, Goiás**

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**ABSTRACT:** *The present research deals with the management of water resources in the basin of the Meia Ponte River, in Goiás, evidencing the characterization of this basin. Also important are the aspects of water prevention, control and monitoring, presenting water resources in the basin of the river Meia Ponte. The placement of these factors contributes to delineate their competencies in relation to water resources in the State and to verify through a comparative analysis - the legislation being the guiding principle, using the instruments included in Federal Law 9.433 / 97 and State Law 13,123 / 97, which establishes the competences of each one and verifies if they are being implemented and applied, specifically in the case of the Meia Ponte river basin, focus of the research. The methodology used in this question is descriptive, retrospective, qualitative and bibliographical. The results includes the interrelations of the descriptors used, together or separately, presenting alternatives for the management of water resources in the Meia Ponte River Basin, in the State of Goiás.*

**KEY WORD:** *Management; Water resources; Meia Ponte River.*

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### **I. INTRODUCTION**

In the last decades, environmental preservation has been the focus of discussions in municipal, state, federal and, especially, international conferences. This is justified because the current development model is based on the intensive use of natural resources, which in most cases has degraded the environment very quickly, requiring the implementation of policies that adhere to economic growth, environmental sustainability and social justice. The paradigm that has guided modern life since Newton, Pascal, Bacon and Descartes has been the domination and appropriation of nature, which has in the industrial revolution its self-realization, based on the capitalist logic of accumulation. Such a paradigm gives us the false idea that natural resources are inexhaustible and that we can do everything in relation to them (SOUZA JUNIOR, 2004).

Among environmental resources, water, a vital resource, has always been seen as an infinite good because of its abundance in much of our planet. But in the latter century, the demand for access to water has increased considerably and is now recognized as a finite good and of economic value of undeniable importance for the survival of humanity. In addition, human activity generates pollution and contamination of this resource, often rendering it unusable, resulting in a reduction in the volume of water that can be used on Earth.

Therefore, the change in the demand versus availability relationship causes a water deficit in several parts of the planet, a fact that has aroused the concern with the preservation of this vital resource. Thus, it is

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fundamental to implement a model of water resources management that privileges the principles and foundations that regulate contemporary human thought, either to value the sharing of decisions among those interested in water, or to seek consensus for the solution of conflicts before a resource that has become scarce and, therefore, so valuable.

The point is that, if current patterns of consumption and damage to the environment are maintained, the picture can worsen very quickly, as the report estimates that by 2025, two-thirds of the global population (about 5.5 billion of people) may have difficulty accessing potable water and by 2050, that percentage would rise to about 75% of humanity. The report also notes that 90 percent of natural disasters are water related, such as Chad Lake in Africa, which has already fallen 90 percent since the 1960s due mainly to overfishing, deforestation and large unsustainable projects of irrigation (PEREIRA, 2008).

In addition, the world will need to manufacture 55% more food by 2030, contributing to a growing demand for irrigation, which currently uses about 70% of all water available for consumption. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2006) estimates that two thirds of humanity will focus on cities in that year and will produce a dramatic increase in demand for water in urban areas. This reality has aroused great interest from international organizations, from different private sector governments, who seek to unite in the search for solutions compatible with a problem that affects a large part of the world population.

Brazil is part of this scenario, and although it has excellent water availability, it already faces regional problems due to the poor distribution of this resource to population concentrations and productive activities. In addition, there are several problems arising from the deterioration of the quality of water resources, promoted by the launching of untreated domestic and industrial effluents and the adoption of inadequate land use and management techniques, as well as deforestation, modification and waterproofing of areas recharge. Although there are several legal institutes in Brazil with the purpose of promoting the management and protection of water resources, only in the last decade, water resources have aroused the real interest of the Brazilian government. Therefore, standardization and institutionalization have evolved according to the needs, interests and objectives established each year.

## **1.2 Research Objectives**

The research aims to show how the management of water resources in the Meia Ponte river basin is established, in relation to the instruments, for the prevention and recovery of the basin in question, as well as its sources.

## **1.3 Research Methodology**

As a methodological procedure for carrying out this study, a bibliographic review was carried out, including consultations on Environmental Legislation, covering Water Resources Management, related archives, publications in periodicals and national books, aimed at demonstrating the management process of Water Resources in the Meia Ponte River Basin in Goiás.

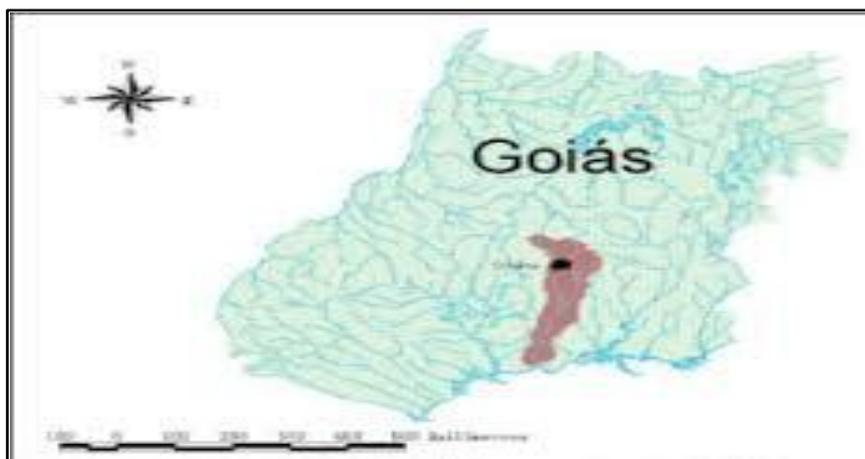
With the use of the research-action type method, which involves the theoretical and practical relationship, we analyzed what the legislation approved and the existing documentation focusing on the catchment area of the Meia Ponte River.

The research-action method enabled, through the results analyzed, the demonstration of problems and the suggestion of proposals of political actions to overcome the imbalances identified. The period selected for the search was based on Law no. 9.433 / 97 - which establishes the National Water Resources Policy and creates the National Water Resources Management System in Brazil - and the State Water Resources Plan, based on the plans of its hydrographic basins, in line with the foundations, objectives and guidelines of the State Policy of Water Resources observed the norms regarding the protection of the Environment and the guidelines of the Plurianual Plan of the State.

## **II. RESULTS AND DISCUSSIONS**

Population growth and the growing increase in socioeconomic development, coupled with the indiscriminate use of resources and the anthropogenic pressure generated by population agglomerations in large urban centers, has absolutely compromised water quality and increased water demand in almost all the regions, in Goiás, the situation has not been different.

The Meia Ponte river is born in the vicinity of Itauçú - GO and flows into the Paranaíba river downstream from the town of Cachoeira Dourada, receiving the João Leite stream and the Caldas river on the left bank. By the right margin its main tributary is the river Dourados (SEMARH, 2007), according to Picture 1.



**Figure 1** -Geographical location of the Meia Ponte river basin, Goiás.

**Source:** AGIM, 2002 apud Pró-águas do Cerrado.

This river goes throughout 38 municipalities in Goiás, emphasizing the state capital Goiânia, in an approximate distance of 471 km until it flows into the Paranaíba river, on the border with Minas Gerais (SEMARH, 2007).

The basin of the river Meia Ponte concentrates 48% of the population of Goiás within its limits, being responsible for the supply of about 70% of the capital of Goiás. As a result, it is considered the most important of Goiás (TEIXEIRA, 2002 apud SEMARH, 2007). The Tecnosan-Prodec Consortium (SANEAGO, 1996) proposed dividing the basin into sub-basins: the lower Meia Ponte, the Dourados river, the Caldas river, the João Leite stream, the upper Meia Ponte river. This division took into account that the springs are the largest tributaries of the river Meia Ponte and that these areas are monitored by fluviometric stations.

According to data from SEMARH (2007), this basin is home to around 50% of the population of the State, accounting for approximately 2, 2 million inhabitants in 2000, the vast majority being about 1.9 million inhabitants of the urban area. Thus, this region suffers intense anthropic pressures, which result in negative impacts on natural resources, especially water and soil. The main environmental impacts in the Meia Ponte river basin include: Disorganized urban expansion; Environment pollution; Erosion and silting of watercourses; Deforestation; Inadequate waste disposal; Use of agrochemicals; Intense agricultural activity; Pasture degradation; Extraction of ores.

It is worth noting that the implantation, in valley bottoms, of industries that use the springs as receivers for industrial effluents is another problem that has been increasing. In addition, it contributes to the environmental degradation of the Meia Ponte river basin: the presence of industries, slaughterhouses, pig farms, fish farms, pens, confinement of cattle for dairy production and corrals, along rivers courses, along with numerous outbreaks of concentration of bathers, that in addition to degrading and demarcating the banks of the rivers, generating solid residues that left to the banks of the rivers.

#### **1.4 Prevention, Control and Monitoring of the Meia Ponte River Waters.**

According to the State Department of Repression of Crimes against the Environment (DEMA, 2010), in Goiás, there is the "Nascentes" Program created with Q7,10 which is the minimum flow with seven days duration and return time of ten years, with the purpose of proposing the recovery of springs and riparian forests, considered permanent preservation, but which is in a state of degradation. Although simple, the program is transparent and has provided satisfactory results, since it combines traditional knowledge with the modern scientist, with a harmonious coexistence between man and nature, with a view to awakening the collective conscience for the preservation of water resources, considering also the economic development of the State.

The justification for the recovery of the springs and riparian forests lies in the fact that they are important in nature, ranging from water retention in the underground storage system, in the control of erosion processes and silting of water bodies, water supply populations, animals and plants. Therefore, the springs and riparian forests are considered ecological corridors, once they are essential for the maintenance of the biodiversity and the perpetuation of the species. According to the agency:

Ideas, plans and speeches must materialize their utopia by presenting concrete solutions and results for the benefit of water, biodiversity and the population that includes it, and as it is sacred in our legal system, maintaining the zeal for the basic principles of public administration. And it is in this sense that the Nascentes Program is presented. It aims, in addition to the recovery and management of degraded river banks and forests

of the State of Goiás, to demand from all conduits compatible with the constitutional duty to preserve and recover the environment (DEMA, 2010).

SANEAGO also began to develop water protection activities with the support and partnerships of environmental agencies, with the objective of recovering catchment areas and protecting hydrographic basins. SANEAGO's Water Resources Protection Policy is based on decentralized actions, coordinated by the Central Coordination (P-GPM), in line with the related Superintendencies, Regional Service Offices and Districts Management (cities operated by SANEAGO) in the interior. The P-GPM, also called the Central Committee, guides all actions required by the Regional Committees, which in turn coordinate the actions of the local committees (cities / districts) by radiating to the local communities, involving them, seeking their support, participation and partnership in the recovery, conservation and preservation of water sources. But all can and should take action at regional and local levels, keeping central coordination informed and provided with data (SANEAGO, 2010)

According to Henrique Luiz de Araújo Costa, Agronomic Engineer of the organ, a model project of reforestation of the SANEAGO plantations was elaborated to provide necessary guidelines for the implementation of forest recovery measures in the areas of the company. The main objectives are:

The recomposition of the ciliary vegetation of the water courses to compensate areas that were occupied for the installation of catchment structures;

Compliance with current legislation;

Improving the visual appearance of these sites;

The sampling of the importance of this project, through the dissemination of the participation of a large company, such as SANEAGO, in its elaboration and execution.

It is noted that the river Meia Ponte presents its high margins, however, in some stretches of flat margins are likely to flood in the rainy season. The annual average temperature varies between 20 ° C and 22 ° C at both ends of the basin. It is worth mentioning the city of Goiânia, with values close to 23 ° C, justified by the urbanization process (DBO Engenharia, 1997 apud SEMARH, 2007).

### **1.5 Water Resources Management Plan**

In relation to the Water Resources Management Plan in the State:

1. SEMARH - According to the Watershed Manager of the Water Resources Superintendence of SEMARH: "The PERH of Goiás is out of date", since it was prepared for the four years 1995 to 1998 and approved by the Legislative Assembly. In 1999, SEMARH updated the Water Resources Diagnosis of the State, being the first step to update the PERH, but states that it was not possible to complete the work. It also emphasizes that "SEMARH has been engaged in the elaboration of a new plan in order to comply with the provisions of the State Constitution", according to article 140, which establishes that the State must elaborate and maintain using the Water Resources Master Plan.
2. CERH - According to the representative of the organ: "There has been a proposal for a State Law for Protection of Public Water Supply Sources approved by CERH and forwarded to the Legislative Assembly. However, it is hoped that the committees will be structured to practice shared management. "
3. COBAMP - According to the President of the organ, the absence of an effective Management Plan for the management of water resources is detrimental not only to the progress of the committee but also to the management of the Meia Ponte river basin itself. According to him, it is the responsibility of the managing body, SEMARH, to prepare a plan with objectives and goals and to refer it to the committee that it can evaluate, follow and submit to the public hearing in order to obtain approval, as expressed in Law 9.433 / 97 (Water Law). Also according to the president of COBAMP: "The same came to make a term of reference then forwarding it to the managing body SEMARH so that it had an orientation, a basis for bidding for this plan of the Meia Ponte River Basin, but unfortunately it was not concluded [...] This is a serious problem that SEMARH should have remedied "(CUNHA, 2010).
4. AMMA - According to the manager of the Environmental Monitoring Management (GEMAM) of the same agency, "the water resources management plan within the municipality is controlled by the environmental monitoring management, together with other environmental management and bodies within AMMA" .
5. SANEAGO - In this regard, the representative of the organ stated that "this issue is not implicit to SANEAGO".
6. DEMA - Asked about the issue of the water resources management plan, the Chief of Police of the State Precinct for Crimes Against the Environment replied that there is no way to define the issue since DEMA has no competence in the management of such resources, since the function of the body, according to him, is "to act in carrying out preventive and repressive activities to crimes involving an integrated and coordinated design to reconcile the need to protect and improve the environment."
7. PUBLIC MINISTRY - Represented by the Attorney General and also Coordinator of the Operational Support Center for Defense of the Environment of the Public Prosecutor's Office, when questioned, did not

elaborate a response on the Water Resources Management Plan by the agency, nor on the other issues concerning the collection, framing, granting and information system. The promoter advised the interviewer to check for answers, Federal Law no. 9.433 / 97, which establishes the National Water Resources Policy and establishes the National Water Resources Management System, regulates item XIX of art. 21 of the Federal Constitution, and alters art. 1 of Law No. 8,001 of March 13, 1990, which amended Law No. 7,990 of December 28, 1989 and State Law no. 13.583 / 00 instituted on 11/01/2000, that is, the State Law of Groundwater.

Therefore, there are several goals to fulfill regarding water, a valuable natural resource, but that is scarce on the whole planet, the result of indifference or human stupidity.

### III. FINAL CONSIDERATIONS

In this context, although the State of Goiás possesses a considerable amount of water resources in its limits, compared to other states in the South and Southeast, it has not privileged the implementation of policies that this management, since it is verified that it is out of date of the PERH to attend the management, since it was elaborated for the quadrennium from 1995 to 1998.

Through questioning presented to the competent bodies, it is verified that the existing instruments need to be implemented in order to strengthen the shared and participatory management of CERH and CBHs, which should focus on favoring multiple and integrated uses, national and state policy objectives of water. The study concludes that this partnership is deactivated, and according to the Meia Ponte River Basin Committee (COBAMP), it encounters difficulties in managing its competencies since there are no resources to implement the prerogatives of the law, due to the absence of practical planning.

The need for structuring and strengthening the SEMARH management body was evidenced, since it is within its competence to meet the demands presented by society and users, fully fulfilling its responsibilities. Therefore, due to the seriousness of the environmental issue, we need to consider all aspects that guide the multiple uses of this vital and vital natural resource to life, ignoring a theoretical discourse, mediated by laws and starting to a process of awareness not only among legal professionals and environmental representatives, who are responsible for implementing measures, but of all population, regarding not only water withdrawals in their quantities, but also in relation to effluent releases in rivers. In this context, every citizen should make efforts to defend this ecological heritage, especially when this environmental issue refers to the water resource, since without water there is no life.

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