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Participation of local entities in the water management of the Piracicaba, Capivari and Jundiaí river basins

Participação de entidades locais na gestão hídrica das Bacias dos Rios Piracicaba, Capivari e Jundiaí

Participación de entidades locales en la gestión del agua de las Cuencas de los Ríos Piracicaba, Capivari y Jundiaí

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RESUMO
A adoção de medidas e procedimentos para a participação local na gestão da água, bem como o planeamento dos recursos hídricos de acordo com a utilização dos diferentes setores estão previstos no Objetivo de Desenvolvimento Sustentável 6 da Agenda 2030. Este estudo procura apontar a participação local na gestão da água, a fim de destacar a importância da comunidade local na gestão dos recursos hídricos. Como metodologia, adota-se a pesquisa bibliográfica com abordagem qualitativa e procedimento técnico documental. Conforme evidenciado no estudo, a importância da participação local na gestão das águas é reconhecida principalmente na gestão das bacias hidrográficas. Argumenta-se que é desta forma que as organizações e a comunidade local podem colaborar com a tomada de decisões para a gestão dos recursos hídricos, observando as questões envolvidas em estudos sobre alocação de água, reutilização de recursos hídricos e sistemas de monitoramento em tempo real. e garantia de abastecimento de recursos hídricos, como defende, por exemplo, o CBH-PCJ. A participação da sociedade na gestão e monitoramento das águas deve ser considerada como forma de ampliar as discussões e potenciais adequações da situação do serviço de água para a população dos municípios envolvidos nas bacias hidrográficas. Acredita-se que o envolvimento da sociedade na gestão das águas permite criar iniciativas de prevenção de crises hídricas e intervenções para o racionamento do uso da água em consonância com as ações previstas nos planos de bacias hidrográficas.

PALAVRAS-CHAVE: Bacias Hidrográficas. Comitês de Bacias Hidrográficas. Gerência de água.

ABSTRACT
The adoption of measures and procedures for local participation in water management, as well as the planning of water resources according to the use of different sectors are foreseen in the Sustainable Development Objective 6 of Agenda 2030. This study seeks to point out the local participation in water management, in order to highlight the importance of the local community in the management of water resources. As a methodology, bibliographic research is adopted with a qualitative approach and documentary technical procedure. As evidenced in the study, the importance of local participation in water management is recognized mainly in the management of hydrographic basins. It is argued that this is how organizations, and the local community can collaborate with decision-making for water resource management, observing the issues involved in studies on water allocation, reuse of water resources and systems for real-time monitoring. and guarantee of supply of water resources, as defended, for example, by CBH-PCJ. The participation of society in the management and monitoring of water should be considered as a way of expanding the discussions and potential adjustments of the water service situation for the population of the municipalities involved in the hydrographic basins. It is believed that the involvement of society in water management makes it possible to create initiatives to prevent water crises and interventions for the rationing of water use in line with the actions provided for in river basin plans.

PALAVRAS-CHAVE: *Hydrographic Basins. Hydrographic Basin Committees. Water Management.*

RESUMEN
La adopción de medidas y procedimientos para la participación local en la gestión del agua, así como la planificación de los recursos hídricos según el uso de los diferentes sectores están previstos en el Objetivo de Desarrollo Sostenible 6 de la Agenda 2030. Este estudio busca señalar la participación local en gestión del agua, con el fin de resaltar la importancia de la comunidad local en la gestión de los recursos hídricos. Como metodología se adopta la investigación bibliográfica con enfoque cualitativo y procedimiento técnico documental. Como se evidencia en el estudio, la importancia de la participación local en la gestión del agua se reconoce principalmente en la gestión de las cuencas hidrográficas. Se argumenta que es así como las organizaciones y la comunidad local pueden colaborar en la toma de decisiones para la gestión de los recursos hídricos, observando las problemáticas involucradas en estudios sobre asignación de agua, reutilización de recursos hídricos y sistemas de monitoreo en tiempo real. y garantía de abastecimiento de recursos hídricos, como defiende, por ejemplo, la CBH-PCJ. La participación de la sociedad en la gestión y monitoreo del agua debe ser considerada como una forma de ampliar las discusiones y potenciales ajustes de la situación del servicio de agua para la población de los municipios involucrados en las cuencas hidrográficas. Se cree que la implicación de la sociedad en la gestión del agua permite crear iniciativas para prevenir las crisis hídricas e intervenciones para el racionamiento del uso del agua en línea con las acciones previstas en los planes de cuenca.

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PALABRAS-CLAVE: *Cuencas Hidrográficas. Comités de Cuenca Hidrográfica. Administracion del Agua.*

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1 INTRODUCTION

The National Water and Basic Sanitation Agency (ANA), an agency linked to the Ministry of Regional Development, created by Law No. 9,984, in 2000, is the regulatory agency whose purpose is to comply with the objectives and guidelines of the Water Law in Brazil and also takes care of aspects related to basic sanitation. In short, it can be said that ANA is the central institution in Brazil responsible for the administration and management of water resources.

According to ANA, the participation of institutions and communities in the management of water resources is essential to "provide legitimacy to public policies and initiatives aimed at the sustainable use of water" (ANA, 2019, p. 84). Accordingly, in the Sustainable Development Goals (SDGs), presented in the document "Transforming Our World: the 2030 Agenda for Sustainable Development", promulgated by the United Nations and endorsed by the Federative Republic of Brazil, there is an appeal to assess the level of participation of local entities in countries in the management of water resources and sanitation.

In fact, in relation to water resources, there is a similarity between the approach proposed by ANA and the objectives and goals of Agenda 2030, especially regarding the sustainable management of water and sanitation, with a view to increasing its availability and capillarity, especially in developing countries, since water resources, as well as the services associated with them, underpin efforts to eradicate poverty and promote economic development.

2 OBJECTIVE

This study aimed to analyze local participation in water management based on SDG 6, especially in terms of supporting and strengthening the participation of local communities to improve water and sanitation management. To this end, we sought to identify the participation of local communities in water management, in order to point out the policies that contribute to meeting the goals of the referred Global Objective, with a special look at goal 6.b, whose purpose is summarized to support and strengthen the participation of local communities in the management of water resources.

3 METHODOLOGY

To address the problem, qualitative research was used, which seeks a systematic explanation of facts that occur in the social context (Gil, 2008). It is noteworthy that this technique arose "aiming to understand the logic of processes and social structures, based on in-depth analyzes of one or a few particular cases" (CEBRAP, 2016, p. 8).

As for the typification of the research, it fits as bibliographic and documentary. Gil (2008) conceptualizes the two types, respectively, as research developed from material already prepared, books and scientific articles and research based on materials that have not yet

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received an analytical treatment for the purpose stipulated, or that can still be reworked in according to the objects of the research.

For the survey, "first hand" documents were considered, for example, official documents, but there are also those that have been processed and that can receive other interpretations, such as the reports from the organizations.

4 WATER RESOURCE MANAGEMENT

According to Ribeiro and Johnsson (2017), in Brazil, the movement related to water governance gained strength from the institutional change resulting from the approval of the National Water Resources Policy (PNRH). The financial incentive program to strengthen water management in the states, called the National Pact for Water Management, launched in 2013 by the Ministry of the Environment and ANA, is important to support water resources management actions.

When it comes to water governance it is important to consider issues of a social, cultural, environmental and political nature. The governance model must be designed in an integrated manner without losing sight of ethics, inclusion and social participation, transparency (Ribeiro; Johnsson, 2017).

The study by Trindade and Scheibe (2019) presents a discussion of the contributions and limitations of water management within the scope of the Brazilian Hydrographic Basin Committees, based on the PNRH. In this study, the authors reinforce that after more than 15 years of the promulgation of the PNRH and the Water Law, there are still challenges to effectively manage water resources in a decentralized, participatory and integrated manner.

In this sense, the authors Trindade and Scheibe (2019) highlight the relevance of the Hydrographic Basin Committees in playing a strategic role in the PNRH, since they are agencies that have the involvement of the government, as well as civil society and have the hydrographic basin as management area:

In Brazil, 197 Hydrographic Basin Committees currently exist, instituted by state decrees which, according to Law No. 9,433/97, are public bodies responsible for discussing and deliberating on matters of common interest to the various users of a hydrographic basin. (ANA, 2015).

One of the main mechanisms for the management of CBHs is the Hydrographic Basin Plan, an instrument that contextualizes the situation of the basin, allowing the elaboration of future projections and the establishment of quantitative and qualitative goals for water management. According to ANA (2021) in the State of São Paulo there are 21 Committees with the respective Basin Plans.

It is noteworthy that one of the limitations in the management of CBHs and PNRH concerns the absence of public information regarding the situation of the basins. All citizens have the right to have access to information and, therefore, to have the necessary knowledge to be able to influence decision-making processes (Trindade; Scheibe, 2019).

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Trindade and Scheibe (2019, p. 6) show that: "I) CBH enhance social participation in decisions involving water management and II) CBHs help to promote environmental education in river basins".

In Brazil, the main restrictions that CBHs face are related to the lack of support (technical, physical and financial) by the States; lack of management tools provided for in the PNRH; low participation of municipal and state governments; and lack of public information about river basin plans (Trindade; Scheibe, 2019).

Another work developed by Trindade and Hoornbeek (2020) discusses the collaborative management of river basins in the United States and highlights elements that contribute to the participatory management of river basins and facing the challenges presented by the Brazilian water management model.

The study brings a comparison between the water management carried out by the groups of American watersheds and the Brazilian CBHs. Trindade and Hoornbeek (2020) mention that, one of the main distinctions between Brazilian and American water management is due to the fact that, contrary to Brazilian management, which aims at decentralization and social participation, the American model, for its part instead, does not require the engagement of society in the management of water resources.

For Trindade and Hoornbeek (2020), although the Brazilian CBHs have more competences in relation to the groups of American watersheds, due to the fact that they can deliberate, in a certain way, about the water management in the watersheds, they still demonstrate a quite limited and inefficient structure. This can be explained by the lack of its own legal personality; lack of basin agencies to assist in carrying out tasks; financial limitations (CBHs operate with public resources and need an entity that executes the collection and application of these resources); low production of evidence, through reports, that disseminate the results about the improvement of the watershed management; among others.

Contributions from the North American management model, according to Trindade and Hoornbeek (2020), can positively impact Brazilian water management, especially regarding the instant need for an entity within the water management system that has its own legal personality, considering that this characteristic it allows for more operational as well as financial flexibility, mainly to manage its budgetary resources.

Another challenge for water management refers to obtaining financial and operational support from the Federal Government and, above all, from state governments, since, in Brazil, CBHs cannot count on financial assistance from private entities. On the contrary, CBHs need to have a diversified composition and the participation of local governments, in order to make the master plans and river basin plans compatible. The American experience enabled us to identify elements that, if used well, can strengthen the performance of the Hydrographic Basin Committees in Brazil and, as a consequence, the compliance with the Brazilian Water Resources Policy. In this context, the importance of the implementation and management of river basin plans by the CBH is recognized as a mechanism for the management of water resources in Brazil (Trindade; Hoornbeek, 2020).

5 RESULTS

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5.1 Participation of the local community in the management of water resources within the scope of the Watersheds Committee

In Brazilian law emphasizes that "the management of water resources must be decentralized and count on the participation of the Public Power, users and communities" (Brasil, 1997, p. 1). In this sense, water management cannot be carried out by an exclusive domain, but rather, it must promote the inclusion and involvement of all individuals, since it refers to a collective good.

From the above, the importance of adopting measures and procedures for local participation in water management is perceived, as well as the need for planning water resources according to the use of different sectors. As shown below, local participation in water management is one of the goals of Sustainable Development Goal 6 of the United Nations (UN) Agenda 2030. In Brazil, in 2019, the National Water and Basic Sanitation Agency (ANA) published the study entitled ODS 6 in Brazil - ANA's view on indicators. This document contains elements that allow the "monitoring of the 8 goals of SDG 6, based on information produced and systematized for the calculation of indicators, in partnership with several institutions" (ANA, 2019, p. 7).

The SDG Indicators study carried out by the Brazilian Institute of Geography and Statistics (IBGE) based on a proposal from the global framework of indicators was important for the development of the SDG Digital Platform in 2018, covering the first set of global indicators, developed in a shared way with other institutions that produce information (ANA, 2019).

In addition, the Institute for Applied Economic Research (IPEA), in 2018, realized the need to readjust the goals established by the 2030 Agenda, emphasizing the reality experienced in Brazil (IPEA, 2018). In this way, it created an Adequacy Proposal for the global goals, involving the nomenclature of the indicators and the relevant concepts (ANA, 2019). Since Brazil is a country rich in territorial dimensions, it can be highlighted that it has great social, economic and cultural diversity, even within the same state. With this, the readjustment of global goals to the reality of each member country becomes essential.

As a collegiate body, the Watershed Committee contributes to give legitimacy to local decisions on water management and use, in a "decentralized way by Watershed and with the participation of public authorities, users and civil society organizations" (ANA, 2011, p. 14).

In reality, the conditions for the political, legal and financial sustainability of the Committee must consider the context of the Hydrographic Basin, political and economic yearnings and legal regulations. In practical terms, the Committee needs technical and management support. This support is offered by the Water Agency, and its creation is conditioned to the establishment of charging for the use of water and proof of its financial viability (ANA, 2011).

The study by Madruga and Silva (2009) presents a discussion on socio-environmental entrepreneurship and the characteristics of entrepreneurial behavior in the management of hydrographic basins. The organization of the Committee was considered by some people of society as a way to promote the economic and social development of the region, by creating

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collective alternatives for the difficulties of the region in relation to the management of the Santa Maria River Basin (Madruga; Silva, 2009).

Regarding the National Water Resources Policy (PNRH), it can be highlighted that the hydrographic basins, a fundamental part of the present work, is the territorial unit where the PNRH is implemented, as well as, it is a place of action for the National System of Water Resources Management (SINGREH).

It can be noted that SINGREH, regulated by Law nº 9,433/1997, which instituted the National Water Resources Policy (PNRH), originated and was established based on the 1988 Brazilian Constitution and encompasses numerous agencies, entities, as well as civil society. ANA, in turn, is the central agency that manages Brazil's water resources and regularly presents statistics and indicators for verifying the results of the implementation of the PNRH in the country and monitoring the National Water Resources Plan (ANA, 2019).

The PNRH highlights the importance of the participation of the Public Power, users and the community in the management of water resources, which must take place in a decentralized manner. It also highlights the relevance of water resources planning according to the user sectors, which can be regional, state and national.

With regard to the Hydrographic Basin Committees (CBHs), an integral part of this work, according to ANA (2019, p. 84) are "collegiate agencies that are part of the National Water Resources Management System (SINGREH)". By having a diversified composition, the committees contribute so that the different sectors of society, which have an interest in the water present in the basin, can have representation, as well as decision-making power over its management. In addition, ANA (2019, p. 84) clarifies that "the members that make up the collegiate body are chosen from among their peers, whether they are from different sectors that use water, civil society organizations or public authorities". CBHs' competences are:

In Brazil, in general, CBHs are constituted due to the existence of confrontations both in terms of quality and quantity of multiple uses of water. In this way, they end up not representing the total number of basins in the country. However, according to ANA (2019, p. 86), "it is precisely in these basins that the participation of users and sectors interested in the management of water resources is most necessary". Therefore, it is appropriate for Brazil to take into account the municipalities participating in these Committees, "as an appropriate instance for local participation in the management of water resources" (ANA, 2019, p. 86).

In this work, the participation of the local community in the management of water resources is studied in the context of the Hydrographic Basin Committee of the Piracicaba, Capivari and Jundiaí rivers - CBH-PCJ.

CBH-PCJ originated through Law Nº. 7,663/1991. It is a collegiate, consultative and deliberative body, with regional operations in the Hydrographic Basins of the Piracicaba, Capivari and Jundiaí Rivers. One of the objectives of this entity is to promote the management of water resources in the areas where it operates, in a decentralized and participatory manner. CBH-PCJ operates in two states, São Paulo and Minas Gerais and covers 71 municipalities.

From the reading of the Synthesis Report - Water Resources Plan for the Hydrographic Basins of the Piracicaba, Capivari and Jundiaí Rivers 2020-2035 (COBRAPE, 2020), aspects related

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to the management of water resources were verified, with regard to the water quantitative and qualitative aspects.

According to COBRAPE (2020, p. 79) "the prognosis of water resources consists of the evaluation of future conditions of water quality and quantity in the PCJ Basins". This assessment, however, is carried out through simulations of future contexts, taking into account the projection of population and economic growth. These variables are considered in order to assist in the implementation of actions to improve the quanti-qualitative condition of the water.

Faced with a situation endowed with complexity with regard to the availability of water and its growing demand, it is necessary, according to COBRAPE (2020, p. 79) "to carry out projects, plans and studies that consider the population dynamics, the multiple uses of water, meeting the framework, increasing water availability and the conservation of water and soil", in order to guarantee the efficient management of water resources in the PCJ Basins. Among the main measures created for the PCJ Basins stand out, in general, plans in favor of basic sanitation, environmental recovery programs and projects related to water management in some municipalities that are part of the Basins.

In order to efficiently manage the Hydrographic Basins, it is necessary to estimate the water demands, which, in turn, must, according to COBRAPE (2020, p. 80) "consider projections of economic growth, the average rate of growth world wide, strongly influenced by the expansion of emerging countries". Considering, therefore, the water demands of the PCJ Basins, the supply of the public sector has the greatest representation, characterizing 40% of them.

Also referring to the management of water demand, according to the study carried out by COBRAPE (2020), it can be said that social participation in the management of water resources, even though, indirectly, through the results obtained in the water demands, is an important tool for the control and management of water.

According to COBRAPE (2020), the PCJ Basins are located on an axis of economic growth and their main water demands are related to supply, irrigation and industrial activities, and their greatest demand is related to the urban supply, followed by industrial activities and, finally, irrigation. In this way, it can be emphasized that, since urban supply is the greatest demand of the referred Basins, efficient management, which counts on the participation of local communities, becomes essential. Through the results obtained in calculating water demands, the population is included and, in water management, it should be no different.

As previously mentioned in this work, the PNRH was instituted in 1997, ensuring several laws and policies regarding Brazilian waters, in order to guarantee an efficient, participatory and sustainable management. However, ANA, also mentioned above, originated only in 2000, as being the organization is responsible for monitoring and managing Brazilian water resources, as well as sanitation. In this sense, ANA also contributes to the management of water present in hydrographic basins. However, each basin has its own agency and, in the case of the PCJ Basins, focus of the present work, the PCJ Agency is the supervisory entity that follows the precepts defined by ANA.

PCJ Basin Committees are present at the PCJ Agency, as previously mentioned. In each CBH-PCJ there are 12 Technical Chambers, one of which is the Technical Chamber for the Conservation and Protection of Natural Resources (CT-RN), the focus of this work (Chart 1).

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The Technical Chambers (CT) of the CBH-PCJ are made up of Working Groups (WGs). CT-RN's activities are carried out by the Indicators and Monitoring Working Group.

Chart 1 - Attributions of the Technical Chamber for Conservation and Protection of Natural Resources (CT-RN) of the CBH-PCJ

Assignments	Description
I- To analyze and comment on proposals or issues relating to:	Protection of hydrological elements (water springs, waterways, lakes, marginal ponds, marshes, among others), prioritizing public water sources; Forest management and other protective vegetation cover, especially native forests of relevant importance for water resources; Impact on fauna and flora, especially the ecotone environment and floodplains; Soil conservation and protection, for the conservation of water resources, avoiding the harmful effects of degradation, erosion and pollution of upland soils and the contour floodplain, both in urban and rural areas; Protection of water resources from anthropic activities, or their indirect effects (sand pits, clay mining, among others).
II – To contribute to the conservation and protection of water in rural and urban areas, through:	Environmental planning, with the implementation of the Master Plan for forest restoration aimed at water conservation in the Hydrographic Basins of the Rivers Piracicaba, Capivari and Jundiaí; Fostering and supporting the creation of programs for Environmental Recovery, Payment for Environmental Services - PSA, implementation of Protection and Recovery Areas of Springs of Regional Interest - APRM and actions for the Protection of the Atlantic Forest, through the "Policies for Recovery, Conservation and Protection of Water Sources of Comitês PCJ" within the scope of Comitês PCJ; Promotion of conservationist practices in soil management; Support in the preparation of Water Resources Situation Reports and the Hydrographic Basin Plan; Promotion of diagnoses, surveys and studies, as well as the creation of sustainability indicators and incentives, for the Recovery and Environmental Protection of PCJ Basins, including: monitoring of river flow, vegetation cover, fauna protection and management, sedimentary, ecological flow and hazardous cargo, among others.
III - CT-RN routine activities:	Decide on requests for inclusion of new members in CT-RN; Attend the deliberations of the Plenary Sessions of the Comitês PCJ; Elaborate, approve and amend, when applicable, its Internal Regulations; Prepare its Work Plan and activities schedule at the beginning of each term.

Source: Prepared by the authors from Comitês PCJ (2021a).

The presence of bodies responsible for specifically caring for water and/or sewage is evident and that make up the CT-RN: Departamento Autônomo de Água e Esgoto de Rio Claro; DAE Jundiaí; DAE Santa Bárbara d´Oeste; Departamento de Águas e Energia Elétrica; Secretaria de Estado da Agricultura e Abastecimento; Serviço Autônomo de Água e Esgotos; SABESP; and SANASA (Comitês PCJ, 2021b).

Also noteworthy are foundations, groups and institutes that participate in CT-RN: Fundação José Pedro de Oliveira; Fundação para a Conservação e a Produção Florestal do Estado de São Paulo; Grupo de atuação especial de defesa do meio ambiente do Ministério Público do Estado de São Paulo - Região Cabeceiras; Instituto de Estudos do Vale do Tietê; Instituto de Pesca - Agência Paulista de Tecnologia dos Agronegócios; Instituto de Pesquisas Ecológicas; Instituto de Pesquisas Tecnológicas; and Instituto de Zootecnia - Agência Paulista de Tecnologia dos Agronegócios (Comitês PCJ, 2021b).

In addition, the CT-RN is formed by the Military Police of numerous municipalities: Campinas; Campo Limpo Paulista; Charqueada; Cordeirópolis; Hortolândia; Itatiba; Itupeva; Jaguariúna; Jarinu; Joanópolis; Jundiaí; Limeira; Nova Odessa; Paulínia; Piracicaba; Clear river; Jump; and Vinhedo (Comitês PCJ, 2021b).

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CT-RN also has the participation of some educational institutions and/or universities: Escola de Engenharia de São Carlos/USP; Escola Superior de Agricultura "Luiz de Queiroz"; Pontifícia Universidade Católica de Campinas; Universidade Estadual de Campinas; e Universidade Presbiteriana Mackenzie - Campus Campinas (Comitês PCJ, 2021b).

As members, it is also possible to mention some organizations that deal with the environment, namely: Coordenadoria de Fiscalização e Biodiversidade da Secretaria de Estado de Infraestrutura e Meio Ambiente; Serra do Itapetinga Movimento pela Biodiversidade e Organização dos Setores Ecológicos; e ONG Suprema - Associação de Preservação do Meio Ambiente. Já o Grupo de Trabalho Indicadores e Monitoramento tem como membros: Cooperativas de Holambra; DAE Jundiaí; EESC/SHS/USP São Carlos; ESALQ/USP; INEVAT; IZ/APTA/SAA; and ONG Jaguatibaia (Comitês PCJ, 2021b).

Considering the members of CT-RN and the GT – Indicadores e Monitoramento, it is possible to identify social participation, acting through associations, institutions, organizations, universities, among other entities. Between the years 2019 and 2020, 12 ordinary meetings were held by the GT – Indicadores e Monitoramento, an integral part of CT-RN. Most of the meetings were held at PUC-Campinas, with the exception of those that took place remotely through video conference call, in 2020.

5.2 Brazilian Federative Units with Water Management Policy

ANA (2019, p. 58) emphasizes that the participation of the local community in the management of water resources must contemplate the provisions of SDG 6, goal 6.b "to support and strengthen the participation of local communities, prioritizing social control to improve the water and sanitation management". It is important to highlight that this goal was readjusted with the insertion of the term "prioritizing social control", which highlights the concern with ensuring the participation of citizens in the decision-making process. It is about the realization of democratic spaces and instruments for discussion, planning and monitoring, by society, in a democratic and participatory way, about decisions and policies.

It is worth remembering that the PNRH contemplates social participation in the management of water resources, acting through the participation of councils such as, for example: the National Environment Council (Conama) and the National Water Resources Council (CNRH). In addition, it has Hydrographic Basin Committees (CBHs), among other forums.

In goal 6 of the SDG, indicator 6.b.1 deals with the "proportion of local administrative units with established policies and procedures aimed at local participation in water and sanitation management" (ANA, 2019, p. 84). This indicator assesses the percentage of local administrative units in a country that can contribute to water and sanitation management through local participation.

The local administrative unit refers to municipalities, sub-districts, communities and/or other locations, covering urban and rural areas, to be defined by the government. Considering indicator 6.b.1, local participation policies and procedures are defined as "mechanisms by which individuals and communities can make a significant contribution to decisions on water and sanitation management" (ANA, 2019, p. 84).

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In relation to the indicator, local participation policies and procedures concern mechanisms that recognize the importance of citizen and community participation in decision making regarding water management and sanitation (Nações Unidas Brasil, 2015).

As for the calculation of the indicator, it considers the municipalities served by the Hydrographic Basin Committees. The calculation of the percentage of local entities participating in the management of water resources considers the location of the municipal headquarters, year by year of the historical series, in relation to the total number of municipalities in the country in the same year (Nações Unidas Brasil, 2015).

The indicador proportion of local administrative units with policies for water and sanitation management (indicator 6.b.1 of SDG 6) aims to identify and evaluate the percentage of local administrative units in a nation that can collaborate for the management of water resources and sanitation, through local social participation.

Based on the data in Table 1, which deals with local administrative units with established and operational policies and procedures for the participation of local communities in water and sanitation management, the South and Southeast regions are the ones with the largest number of policies and procedures for enabling social participation in the management of water resources.

Table 1 - Local administrative units with established policies for local communities' participation in water and sanitation management

Brazilian Regions	2011	2012	2013	2014	2015	2016	2017
North	4	4	5	11	12	13	13
Northeast	33	34	37	39	41	41	42
Southeast	51	51	52	53	55	56	58
South	48	50	58	60	63	65	66
Mid-West	21	23	33	39	42	43	44

Source: ANA (2019).

The study carried out by Gomes and Barbieri (2004) aims to discuss the management of Brazilian water resources from the point of view of the solutions adopted in the state of São Paulo reveals the policies of Brazilian federative units regarding local participation in the management of water resources.

Gomes and Barbieri (2004) show that the main challenge in Brazil refers to sustainable water management, since it is necessary to meet the needs of the current demand, which is increasingly greater, without compromising that the future demands also be satisfied. It is in this sense that the discussions on implementing policies for water management originate, aiming to guarantee the conservation of water and its efficient use.

In addition, Gomes and Barbieri (2004) emphasize that water, as it is a scarce and finite resource, its consumption is still growing, especially in Brazil, where the idea of water abundance reinforces the culture of waste. The way water is used and degraded has been causing numerous problems, in several territories of the globe and such adversities can be aggravated, even more, by climate changes.

It is noteworthy that, for an individual to have a healthy life, a minimum of 1,500 m^3 of water per inhabitant/year is required. In this way, it can be understood that, for human consumption alone, a high portion of water is used, without considering its other uses (irrigation,

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industrial processes, power generation, etc.). In 2001, a result obtained at the International Conference on Fresh Water, in Bonn, evidenced that, at the time, 1.2 billion people lived without access to water, in quantity and quality for a dignified life (Gomes; Barbieri, 2004).

In Brazil, the supply of water resources is still seen as generous, since the country has about 12% of the planet's water reserves. Table 2 represents the situation of Brazilian water resources, in 2004, in comparison with some European countries.

Table 2 - Availability of water resources in Brazil and Europe

SITUATION (m³/inhab/year)	COUNTRY	AVAILABILITY (m³/inhab/year)	FEDERATIVE UNIT	AVAILABILITY (m³/inhab/year)
			Roraima	1.747.010
			Amazonas	878.929
			Amapá	678.929
			Acre	369.305
Abundance			Mato Grosso	258.242
>20.000			Pará	217.058
			Tocantins	137.666
			Rondônia	132.818
			Goiás	39.185
	Finland	22.600	Mato Grosso do Sul	39.185
	Sweden	21.800	Rio Grande do Sul	20.798
	Ireland	14.000	Maranhão	17.184
Very Rich			Santa Catarina	13.662
>10.000	Luxembourg	12.500	Paraná	13.431
	Austria	12.000	Minas Gerais	12.325
Rich	Netherlands	6.100	Piauí	9.608
> 5.000	Portugal	6.100	Espírito Santo	7.235
	Greece	5.900		
Balanced	France	3.600	Bahia	3.028
> 2.500	Italy	3.300	São Paulo	2.913
	Spain	2.900		
	United Kingdon	2.200	Ceará	2.436
	Germany	2.000	Rio de Janeiro	2.315
Poor	Belgium	1.900	Rio Grande do Norte	1.781
< 2.500			Distrito Federal	1.752
			Alagoas	1.751
			Sergipe	1.743
Critical			Paraíba	1.437
Situation			Pernambuco	1.320
< 1.500				

Source: Gomes and Barbieri (2004, p. 6) and Thame (2000).

As shown in Table 2, out of the 27 Brazilian federative units, in 2004, 11 demonstrated a high and abundant water supply, that is, greater than 20,000 m³/inhabitant/year. Still in Brazil, 4 federative units had a situation considered to be very rich, 2 units were in a rich condition, 2 in a balanced situation, six in a poor situation (less than 2,500 m³/inhabitant/year) and 2 had a scarcity condition (below 1,500 m³/inhabitant/year). The state of São Paulo, at the time, had a balanced situation (Gomes; Barbieri, 2004).

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Regarding the situation of the hydrographic basins of the state of São Paulo, in 2004, it can be mentioned that four basins presented a critical condition. The Alto do Tietê basin had a water availability of 200 m^3/inhabitant/year; the Piracicaba, Capivari and Jundiaí river basin had an availability of 400 m^3/inhabitant/year; in the Turvo/Grande River basin there were 900 m^3/inhabitant/year; and, finally, in the Mogi-Guaçu basin, there were about 1500 m^3/inhabitant/year, of water availability (Gomes; Barbieri, 2004).

According to the data obtained through the Water Resources Situation Report: UGRHI 05 - Hydrographic Basins of the Piracicaba, Capivari and Jundiaí Rivers, it can be emphasized that, although the referred basins, in their São Paulo portion, have a significant amount of large water sources, a reduction in its per capita water availability is observed. In 2014, for example, availability was 1,014.13 m^3/inhabitant/year and, in 2018, it changed to 971.08 m^3/inhabitant/year. In this sense, a reduction of 4% is evidenced, during those years (COBRAPE, 2020).

These data are worrisome when considering the water crisis experienced in 2014 by the Macrometrópole Paulista, which covers 173 municipalities distributed between the Metropolitan Regions of São Paulo (RMSP), Baixada Santista (RMBS), Campinas (RMC) and Vale do Vale Paraíba and Litoral Norte (RMVPLN), in the urban agglomerations of Sorocaba, Piracicaba and Jundiaí and in two other micro-regions, totaling more than 30 million inhabitants directly or indirectly affected, covering the entire extent of the PCJ Basins. The 2014 water crisis resulted in a notable mobilization of civil society, in front of the scenario of "uncertainties, distrust and inability on the part of public managers to give concrete answers to society about the problem" (Jacobi; Cibim; Leão, 2015, p. 33).

Thus, it appears that the surface water availability in this region is very limited, and there is a trend of continuous decrease in the volume of water available per inhabitant. The water supply can be considered unsatisfactory, when compared with the values stipulated for the state of São Paulo (1500 m^3/inhabitant/year), thus characterizing the problem of water stress. In addition, there is also an increase in the use of water in rural areas and in underground abstractions, which contributes to the reduction of water availability (COBRAPE, 2020).

6 CONCLUSION

The Hydrographic Basins are extensions in which the National Water Resources Policy must be implemented and, therefore, the agents responsible for its administration must follow the guidelines contained in the PNRH.

As evidenced in the study, the importance of local participation in water management is recognized mainly in the management of hydrographic basins. To this end, the community and interested organizations can act together with the Basin Committees. It is argued that this is how organizations and the local community can collaborate with decision-making for water resource management, observing the issues involved in studies on water allocation, reuse of water resources and systems for real-time monitoring and assurance on the supply of water resources, as defended for example by CBH-PCJ.

Thus, governments, Civil Society Organizations and companies have set priorities to combat harmful conduct to the maintenance of life on the planet and have started to devote attention and resources to models to reduce negative impacts on society and ecosystems.

The participation of society in the management and monitoring of water is foreseen in the goals of SDG 6 of Agenda 2030 and should be considered as a way to expand the discussions and potential adaptations of the situation of water service, for the population of the municipalities involved in the hydrographic basins. With the involvement of society in water management, initiatives can be created to prevent water crises and interventions for the rationing of water use in a manner that is in line with the actions provided for in river basin plans. As pointed out in this study, water management must be shared, inclusive and participatory.

Furthermore, it is emphasized the need to carry out projections that indicate the quantitative and qualitative aspects of the waters present in the PCJ Basins, considering the ongoing climate changes driven and accelerated by anthropic action, as well as population growth, in order to guarantee access to water for everyone.

In addition, referring to the water availability of the PCJ Basins, based on the aforementioned documents, it is possible to identify that, in 2004, the water availability already showed warning signs regarding the fulfillment of the various uses by society. In 2014, a decade later, this situation showed significant improvements that have not been maintained over the years, especially in the face of the water crisis experienced in the São Paulo Macrometropolis. This is because, in 2018, water availability decreased and was still below the ideal level foreseen for the state of São Paulo.

Given the above, it is checked that the PCJ Basins at certain times present different realities in meeting the demand for water. This reinforces the need to increasingly adopt an integrated and shared management, so that society and the local community can participate in the discussions within the working groups with the PCJ Watershed Committee, in order to collaborate with the actions for the management of water resources, in the construction of a genuinely sustainable development.

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