

# ENVIRONMENTAL SUSTAINABILITY AND INTEGRATION IN WATER RESOURCES POLICY IN BRAZIL: INSEPARABLE ISSUES

## SUSTENTABILIDADE AMBIENTAL E INTEGRAÇÃO NA POLÍTICA DE RECURSOS HÍDRICOS NO BRASIL: QUESTÕES INSEPARÁVEIS

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## ABSTRACT

The article deals with factors considered to guide Brazil's water resources management policy, integration and articulation, aspects that are included in the legal basis of national policy (Law no. 9,433/1997; chapter III). It emphasizes the evaluation of the discussion of water policy and its interface with other sectorial policies. To understand the scope of the concepts of integration and articulation, and dialogue with practice, the perspectives of integrated management adopted by the Global Water Partnership, entitled "Integrated Water Resources Management", will be presented, as well as the one developed by the New Water Culture Foundation, associated with an ecosystem perspective. It evaluates how the issues of integration between policies and perspectives are taking place within the framework of the Brazilian National Water Resources Council, the central forum for discussions on the country's water policy. The systematization of data is based on the survey and analysis of the minutes and guidelines within the 20 years of existence of this Council. The minutes were systematized with the statistical Program R to evaluate the frequency of terms cited during the meetings. The themes of the agendas were organized into six major topics: rules of operation, management tools, integrated water management, sector articulations, environmental education, presentations. It became clear that the guidelines in greater numbers deal with the operating rules that aggregate administrative issues and general rules.

**Keywords:** integration of public policies; water resources governance; integrated water resources management; National Water Resources Council; water management tools.

## RESUMO

O artigo trata de fatores considerados orientadores da política, da integração e da articulação da gestão de recursos hídricos do Brasil, aspectos que constam da base legal da política nacional (Lei nº 9.433/1997; capítulo III). Ele enfatiza a avaliação da discussão da política de água e sua interface com outras políticas setoriais. Para entender o alcance dos conceitos de integração e articulação, e dialogar com a prática, serão apresentadas as perspectivas da gestão integrada adotada pela Parceria Mundial da Água (Global Water Partnership), intitulada "Gerenciamento Integrado de Recursos Hídricos" (Integrated Water Resources Management), e também aquela fundamentada pela Fundação Nova Cultura da Água, quando trata da perspectiva ecossistêmica. Avalia-se como as questões da integração entre políticas e perspectivas estão ocorrendo no âmbito do Conselho Nacional de Recursos Hídricos brasileiro, fórum central das discussões da política de águas do país. A sistematização dos dados se apoia no levantamento e na análise das atas e pautas tratadas durante os 20 anos

de existência do conselho. As atas foram analisadas com o Programa estatístico R para avaliar a frequência de termos citados durante as reuniões. Os temas das pautas foram organizados em seis grandes tópicos: regras de funcionamento, instrumentos de gestão, gestão integrada da água, articulações setoriais, educação ambiental e apresentações. Tornou-se claro que as o maior número de pautas versam sobre as regras de funcionamento que agregam questões administrativas e normas gerais.

**Palavras-chave:** integração de políticas públicas; governança de recursos hídricos; gestão compartilhada de recursos hídricos; Conselho Nacional de Recursos Hídricos; instrumentos de gestão da água.

## INTRODUCTION

### Theme, objective, procedures

The theme of this article is the analysis of the Brazilian water resources public policy, instituted by Law no. 9,433/1997 (BRASIL, 1997) on the issues of integration and articulation. This law has foundations, objectives, guidelines for action and technical and financial instruments to implement the policy through of the National Water Resources Management System, whose highest decision making body is the National Water Resources Council (Conselho Nacional de Recursos Hídricos – CNRH).

The focus of the article is on these two action guidelines, integration and articulation, defined in Chapter III of the Law nº 9,433/1977, considered strategic to the extent that water is the main element and transversal to various public policies, as it will be detailed below, as well as its management and consequent environmental sustainability, to comply with the aforementioned guidelines. We will conceptualize these two guidelines and investigate how they are approached within the CNRH. We will also explore the development of the management instruments provided by law.

Thus, the objectives of this article are, firstly, to present how these guidelines are expressed in the law and the concepts underlying them, taking as reference the literature on integrated management and the management models. Secondly, the focus is on the dynamics of the CNRH, characterizing its composition and the themes discussed. The guidelines and minutes of the 81 meetings held are the basic reference material, identifying those themes that had

more emphasis over the 20 years, the frequency they were addressed, and the debate on management instruments and the relationship between water policy and other public policies. The text addresses how the integration and articulation guidelines are presented and which technical and financial instruments are given greater attention.

The theoretical framework is based on the approach concerning integrated management, formulated by the Global Water Partnership (GWP), and we also include the one developed by the New Water Culture Foundation (Fundación Nueva Cultura del Agua – FNCA). The GWP is an international umbrella organization that promotes network action in order to develop knowledge and expand capacity for water management at all levels — local, national, regional and global — and disseminates the concept of Integrated Water Resources Management (IWRM). The FNCA is an organization composed of Iberic professionals from various areas, who, based on scientific knowledge and social sensitivity, seek to promote changes in water policies emphasizing sustainability. For FNCA (2020), the ecosystem management model is also based on an integrated vision. Besides these two perspectives, we also include the water management paradigms identified by Allan (2003).

The theoretical aspects regarding integration and articulation are presented, as well as the outcomes of the research on the translation of these guidelines into effective action, having the CNRH as the scenario. The

source material, the agenda and minutes of its activities, was systematized and analyzed as it follows. Initially, all the agendas of the 81 meetings of the CNRH held between 1998 and 2018 were collected and tabbed in order to identify a thematic pattern for the proposed agendas, taking as a guide the concern with integration and articulation and the management instruments. These agendas were read individually and organized and registered; repetitions were then checked, and a pattern was defined. Six recurrent themes were identified: rules of operation; management tools; integrated management (management without natural barriers, including fresh, brackish and saltwater, surface and underground, and factors that lead to commitment); sectorial articulations (articulation between public policies transversal to water); environmental education (activities aimed at training for the management and valorization of the resource) and other specific themes

### Problematization and legal basis

The terms “integration” and “articulation” are part of the general action guidelines of the Brazilian National Water Resources Policy. They are associated with environmental management and multiple uses of water, as well as its relation with the territory, estuarine and coastal zones. The term articulation is associated with the relationship between levels of federal entities, *i.e.*, the Union and the States (JACOBI 2009). From this emerges the first question that we seek to address: do integration and articulation occur? The second question, which derives from the first, aims to analyze whether the management instruments, which should theoretically guide policy

### Fundamentals of integrated management and sustainability of development

According to Agudo (2009 p. 101), professor at the University of Zaragoza and one of the mentors of the FNCA, it is necessary to change our way of thinking: water management must be carried out from the perspective of the ecosystems, rivers and aquifers where they are inserted. It represents a much more complex approach than the predominant still being practiced today in several countries, as water is considered only in the river trough.

Iuarte (2003) highlights the concept of integration as fundamental to protect water and associated ecosystems. It characterizes the integration not only by the

on strategic issues. This theme will be detailed below, and the tabulation presented in Table 1.

The second process developed with the issues addressed by the 81 minutes was through the R software, a statistical computing system that facilitates account for information and generates frequency graphs that, in this case, pointed out the frequency of strategic themes, previously determined by the researchers, and guided by the concerns of the research.

The themes previously determined to organize through the R system are environmental education, water management, management tools, environment, land-use planning, cross-border relations, sanitation, health, sectors involved in water management and management unit. They were chosen as they encompass both sectoral policies and the environment.

action, are developed for this purpose and induce the intended integration. We are dealing with the instruments provided by law, such as the Water Resources Plans, the classification of water bodies into classes according to their predominant uses, the granting of the right to use water, the information system and the charging for water use.

As water is a cross-cutting theme in several areas and contemplated by other policies, as it will be presented below, we assess whether and how often discussions on other sectoral policies take place during CNRH meetings (JACOBI, 2009).

way water becomes available — be it surface or underground, by its quality or quantity — but also points to the need to integrate the subjects that through an articulated and interdisciplinary dialogue (JACOBI, 2009) with hydrology, hydraulics, ecology, chemistry, agronomy, economics, sociology and law, as well as with different approaches and experiences that improve the management process. The concept also involves cooperation and coordination between different sectors and levels of government (national, regional and local) and strengthens the premises regarding the integration of users and social groups that should participate

in the decision-making process, in order to boost the social learning process (JACOBI; BUJAK; SOUZA, 2018; WALSH, 2007) and thus lead to the implementation of commitments.

Still, according to Agudo (2015), management should be based on three ethical categories that relate water to life, citizenship and economy. First, water and life — concern the survival of all living beings, ecosystems and communities, as well as traditional forms of production, emphasizing the need to promote water sharing, as this is a principle that guides UN Resolution nº 16/02, that proclaims that water and sanitation are human rights. The second in importance and connected to the first relates water to citizenship and concerns the role of health and social cohesion, *i.e.*, the precautions and care of population linked to water supply services, collection and treatment of sewage. It also includes the characteristics of management that should bind the rights and duties of the citizenry through the implementation of participatory public management, a tariff system under control and social criteria that allow the financing of efficient universal services. Water linked to economic issues is a point related to productivity issues and the generation of benefits to improve the lives of users, which have to follow criteria of economic rationality. This category represents the water that is used and that generates problems related to pollution, and in which criteria of social and inter-territorial equity must be applied.

The concept of IWRM, a method developed between 1997 and 2000 and disseminated by the GWP, is to be considered. It is characterized as

a process that seeks to promote coordinated development and management of water, soil and related resources in order to maximize social and economic welfare, also committed to the sustainability of ecosystems and the environment. Within the principles, it provides for broad participation of all social sectors, social equity, economic efficiency and ecological sustainability (GWP, 2019).

It should be noted that the concept of IWRM “was approved by the European Water Resources Directive, to realign its water management strategies at basin scale in all of its member countries” (RODORFF *et al.*, 2015 *apud* MOLLE, 2008).

This management model breaks away with the hydraulic paradigm, emphasized by engineers until the early 1980s. Allan (2003) considers IWRM as a response to the inefficiency of old policies, and the approach recognizes competitive demands, such as that of irrigated agriculture versus environmental services, and the relationships between upstream and downstream properties of the same watercourse. The author also highlights that this is a political discursive process, and not just a planning process. This perspective seeks to consider within water management not only the environmental issues but also the economic ones, and its essential aspects for its allocation and management.

The process of allocation and management differs between countries due to social, political and economic constraints. Thus, North and South, from Allan’s (2003) point of view, manage water under different perspectives and policies. Moreover, IWRM is subject to variations in terms of its incorporation, depending on its capacity to assume innovations, whether in conceptual or technological sense (ALLAN, 2003). Allan highlights the role of the Green Movement (decades of 1970/1980), which helped to raise awareness of water scarcity in society.

Allan presents a conceptual framework in which he shows the changes in water use trends for irrigation between 1850 and 2000, and defines five paradigms for water management, considering the technical and organizational capacity, which can be seen in Chart 1.

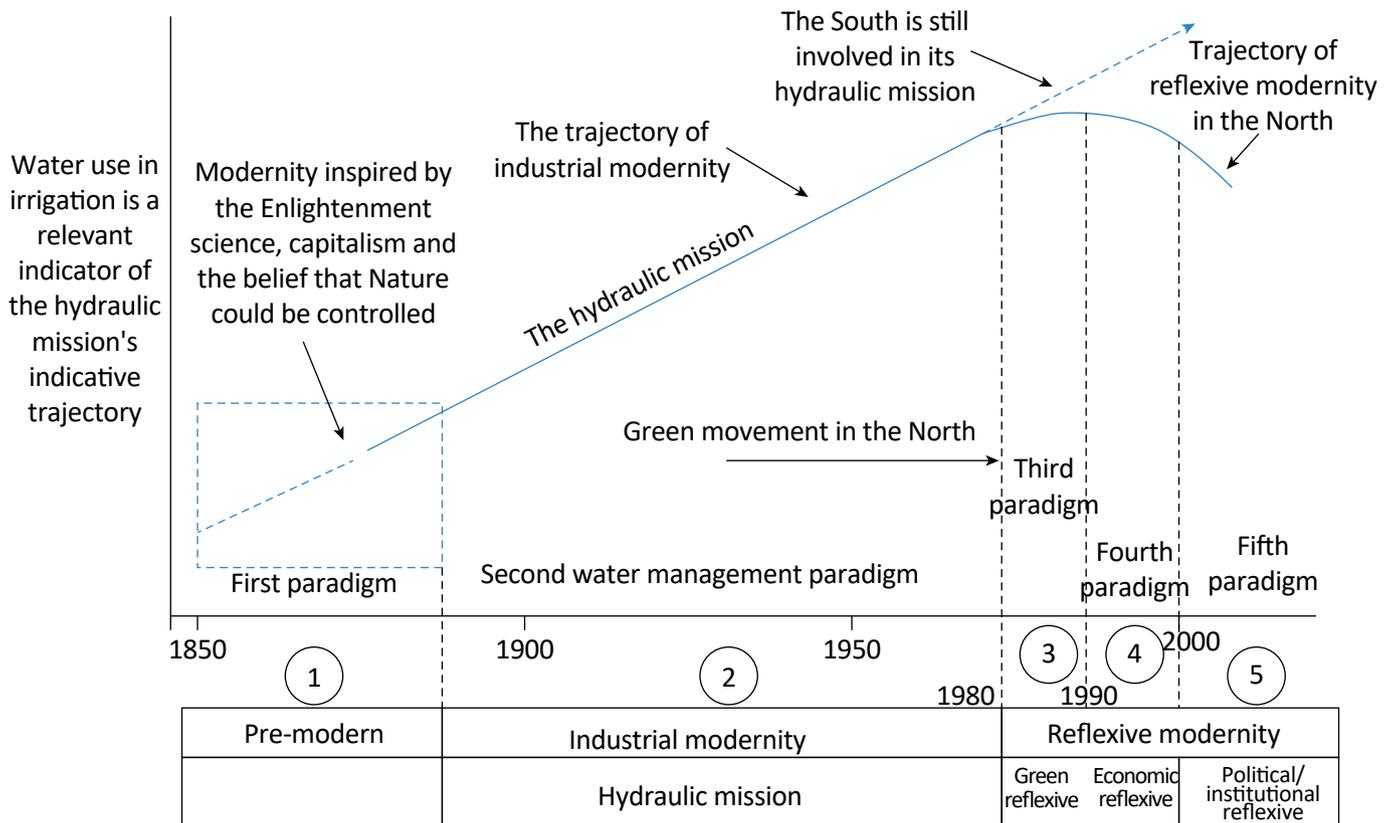
- Pre-modern (1850–1900): drinking water, food production, livelihoods. Low technical and organizational capacity;
- Industrial modernity (1900–1980): Hydraulic Mission (infinite water to meet demands; support in engineering works; low population and demand). Economic priority;
- Green reflective modernity (1980–1990): the risks are now considered. Valued environmental services;
- Reflective economic modernity (1990–2000): economic value. Charging for water use;
- Reflexive political and institutional modernity (2000–present): political process. Consider the demands of various sectors of society. IWRM model.

Brazilian policy is still partly based on the hydraulic paradigm (ALLAN, 2003), as it operates based on engineering works, with the construction of hydraulic works of great magnitudes, such as the transposition of the São Francisco River. The granting process is still carried out from the perspective of meeting demand and the assumption that water is infinite, not supply management, which is considered more ecologically and economically sustainable (PATO, 2013).

The policy proposes the valuation of water as an economic good, which can be charged — as may be assessed below, from the discussion of the issue in plenary sessions — and evaluates the risks of its poor quality or the effects of climate change on the general water dynamics since it is the point of argumentation at CNRH. However, it still needs to be guided

by environmental concern and the maintenance of ecosystems.

When thinking about sustainability (ALLAN, 2003), the two main challenges of integrated water resources management are precisely sustainable development and intersectoral planning, which must be achieved through different approaches. For management, water should be thought of as a whole, not just like a river in its course, and should involve the participation of different stakeholders in the issue, from the most qualified — either technically or in government functions — to those affected by the problems. This has to be without necessarily having a specific qualification; moreover, among other strategic issues, water should be recognized as an economic good, and its equitable allocation should be emphasized.



Source: Allan, 2000.

Chart 1 – The five paradigms of water management (1850–2000).

## Sectoral articulation: water in the various policies

Since this is a natural resource within the public domain, available on the surface of rivers, lakes or seas, or underground in aquifers, and must meet the multiple demands of society, the water resources policy, according to Law nº 9,433/97, aims to ensure that all social and economic demands are met by the water of adequate quality and quantity, and must also take steps to prevent critical events (floods, for example), misuse (excessive) or poor conditions (polluted water). Thus, this policy is focused on water in its natural environment, the river basin, the aquifer or in its other forms of availability.

The national sanitation policy, foreseen in Law nº 11,445 of 2007 (BRASIL, 2007), aims to ensure that citizens, especially in urban environments, are served by sanitation services that include water supply, collection, treatment and final disposal of sanitary sewage, urban cleaning and solid waste management, in addition to drainage. The focus here is on services and sanitation, a fundamental factor for the supply of water in proper quality. Thus, it is understood that both policies must be in constant dialogue.

The national environmental policy, provided by Law nº 6,938/1990 (BRASIL, 1990), aims to preserve, improve and restore environmental quality, in order to ensure adequate conditions for socioeconomic development. This policy involves the natural elements: water, air, soil and subsoil. Its focus is on avoiding pollution, disciplining activities, for example, through the licensing of potentially polluting activities. The policy also defines quality standards, including water and spaces that must be protected, among other action instruments and guidelines. Thus, it is understood that the environmental policy should not conflict, but be associated and coordinated with the two previous policies in order to achieve its objectives.

The relationship between water and health dates back to the Federal Constitution of 1988, which, in its

## The National Water Resources Council: a scenario for policy debate

In Brazil, the framework for the creation of public policy councils is the 1988 Federal Constitution, which “defined social participation as necessary for some specific policies” (IPEA, 2013), opening space for

article 200, establishes, among the competencies of the Unified Health System (Sistema Único de Saúde — SUS), to develop actions in the area of sanitation and control of water for human consumption (BRASIL, 1988). This article is the motto for Law no. 8,080/90 (SUS Organic Law), which details these competencies (BRASIL, 1981). The Organic Law opens the gap for Decree no. 5,440/2005 (BRASIL, 2005), which establishes definitions and procedures on water quality control of supply systems and places the Ministry of Health among those involved directly in the matter. This Decree establishes the standards of potability, control and monitoring of water quality, currently in force through the Ordinance of the Ministry of Health No. 2,914/11 (BRASIL, 2011).

Thus, while Water Resources and Environment policies are focused on water in the natural environment, the sanitation policy is focused on capturing and treating this water, meeting the requirements of intended use, health and safety for this water to be consumed by the population. With this description, it is relevant that these policies need to be coordinated and in dialogue in order for water to be, in fact, well managed.

As to the issue of land use planning, which, in the absence of a national policy establishing objectives and actions to achieve a balance in land use and occupation, it usually ends up being the main vector of environmental impacts, particularly on the water, the case of pollution and silting up of water bodies, as examples (SANDER; MAIORKI, 2012). The lack of a national policy does not prevent states and municipalities from taking initiatives and using environmental policy instruments, such as Economic Ecological Zoning and the creation of conservation units, in an attempt to organize the space of their territories, but, unfortunately, there is still no generalized action to reduce the impact of the various uses that are given to the territory and the effects on the water before its misuse.

power-sharing. Public Policy Councils are understood as public spaces linked to bodies of executive power. Their purpose is to allow the participation of society in the “definition of priorities of the political agenda,

and to support the formulation, monitoring and control” (IPEA, 2013). The Councils can be “considered hybrid institutions since the State and civil society share decision-making power and constitute public forums that capture demands and agree on specific interests of various groups involved in a given policy area” (MANCINI, 2019).

Until December 2018, CNRH was composed mostly of representatives of the public sphere, either federal or state, with 29 ministerial representatives and 10 representatives of state water resources councils, represented by members of the State Secretariats that coordinate water policy agenda. There is also the participation of 18 members of civil organizations, 12 of which represent users (irrigators; public service providers of water supply and sanitary exhaustion; concessionaires and authorized hydroelectric generation; hydro-way/port sector; mining-metallurgic sector; fishermen and users of water resources for leisure and tourism) and 6 represent civil organizations of water resources (committees; consortiums and inter-municipal associations of hydrographic basins; technical teaching and research organizations; environmental entities).

Representatives of public authorities are appointed by their own institutions and those of civil society through

### Guidelines and themes of the CNRH

The theoretical model used for the analysis of the dynamics of the CNRH, through the evaluation of the issues of guidelines on integration and articulation, is based on Archon Fung (2006), a theoretician of participatory democracy, who proposes dimensions to be considered in the evaluation of the effectiveness of policies. The three dimensions are: who participates in the Council (already presented above); what is discussed, with focus on the agendas; and the proposal to be evaluated and if the debate leads to public action.

In order to identify whether the existing sectoral policies and instruments promote some type of discussion on the integration and articulation of water policy with other policies, detailed documental research of the agendas discussed at the CNRH in its 20 years, and its 81 ordinary and plenary meetings, the last one being held in 2018. The Executive Secretariat of the CNRH and the coordination of its Technical Chambers defined the majority of the agendas.

an electoral process as the constituency of the sectors represented. The renewal process takes place every two years, in accordance with the bylaws of CNRH.

During the last 20 years, the Council and its 10 Technical Chambers that deal with specific issues related to Water Resources Policy have been active in Brazil until recently.

It is worth noting that this interruption is justified by the fact that, in early 2019, administrative reform was carried out that still extends in many respects through the Provisional Measure no. 870/2019 that recently created Ministry of Regional Development (MDR) and aggregated the attributions of the then existing Ministry of Cities, the Ministry of National Integration, the Departments of Water Resources and Revitalization of Watersheds and Access to Water of the Ministry of Environment (MMA), besides attributions of the National Water Agency (ANA). The MDR is presently responsible for the integration and coordination of the water agenda within the Federal Government (BRASIL, 2020). The Decree no. 9,666/2019, created the National Secretariat of Water Safety (Secretaria Nacional de Segurança Hídrica — SNSH), define its competencies in article 16. Thus, the CNRH is no longer linked to the Ministry of Environment, but to the Ministry of Regional Development.

As follows, we present a summary of the themes discussed at the CNRH and a quantitative systematization of the incidence of related sub-themes that constitute the guidelines. The thematic systematization based on the agenda addresses:

- Rules of operation of the Council and related bodies inserted in the National Water Resources System, such as: regulation, mission and composition of the Council and Technical Chambers; creation of management bodies such as River Basin Committees and Management Agencies (delegating entities); agenda and work plan for the system; related legal issues;
- Management Instruments (what are the instruments and how often these instruments are discussed): National Plan or Water Resources Plan; environmental granting and licensing; framework of water bodies in a class of predominant use; information

system for the management of water resources; national hydrographic division, classification of water-courses; collection for the use of water; monitoring;

- Integrated water management: correlation between surface, groundwater and coastal water; issues of quality and quantity; mineral water; sustainability in the use of water resources, dominance;
- Sectoral articulations: identify which sector policies related to water management have been addressed in the CNRH: sanitation; environment (impact assessment); food security; water security; territory and mining;
- Environmental education: definition of commemorative dates; training of members; insertion of postgraduate programs in universities (emphasis on hydrogeology);
- Lectures/presentations on strategic themes, such as transposition of the São Francisco River, extraction of shale gas, drought in the Northeast and Southeast, and rupture of the dams of Fundão in Mariana (2015) and Brumadinho (2019), both in the State of Minas Gerais.

Considering the themes, we also detail the contents discussed under each of them, as can be seen in Table 1.

What can be observed is that the agendas prioritize the rules of operation that aggregate mostly administrative issues, representing a total of 201, while 174 are linked to other themes. The aspects related to rules of operation are mostly forwarded by the Legal Technical Institutional Chamber. The significant number, which demands more time and work from the plenary, due to the constant revisions made to the CNRH's bylaws, adapts its rules of operation to the demands of the members and their segments or sectors; also, to a large number of Technical Chambers, which maintain their own bylaws and rules for operation; and to feedback these issues to the agenda in subsequent meetings, since they are rarely approved in their first session.

The management instruments are the main tools related to water policy to be implemented, with the consequent improvement of water conditions, whether in

terms of quality or quantity. Water Resources Plans allow the diagnosis of the situation of a certain portion of the territory (basins, states or nation) and the actions to be developed and prioritized there. Through the Regulatory Water Framing, goals are established to achieve the improvement of water conditions, in order to meet the various current and future projected demands. With the water charges, prices are established for the withdrawal, release and consumptive demands, and simultaneously an instrument of planning and economic/financial strategy.

Considering the themes included in the guidelines, the debates on Water Use Charging have been predominant, as most Water Basin Committee's demand and depend on these resources to implement their actions. In second place, in the debates, arise issues associated with the National Water Resources Plan (24), indicating the role and showing the effort of CNRH in its formulation. Notwithstanding, the legal water framing, an essential tool to promote an integrated approach to water and its environment as to its relationship with the territory, is inexpressive, having only four inclusions in the agenda during 20 years.

In continuity to the themes addressed by the CNRH, those classified as inducers of the debate on integrated management are those based on the categories developed by Ituarte (2003), integration of the discussion of surface and groundwater, quality and quantity aspects, consideration of associated ecosystems and different degrees of salinity. Adding all these themes, they are part of the debate 32 times, being 11 linked to groundwater, one of the most active Technical Chambers of the CNRH, that having as its framework integrated management, is part of an active network of hydrogeologists in Brazil.

The issue of coastal water is only mentioned six times, and the approach, integrating freshwater with coastal water, suffered strong resistance to its approval from the government sectors and the productive sector, mainly due to an understanding that the inclusion of coastal waters would disfigure the Council, thus causing legal insecurity for the private sector when requesting the water allocation grant. This is due to the fact that it is not yet foreseen for saline water and even for water charging (in the case of releasing load or desalination). The coastal issue is also included in the agenda when related to

the integration of Water Resources Plans in Water Basin Committees meetings these issues, what never occurred.

On the other hand, the themes of pollution and degradation appear only five times (pollution four and degradation one), and the counterpoints protection (2)

**Table 1 – Themes and sub-themes discussed at Conselho Nacional de Recursos Hídricos (CNRH) meetings between 1998 and 2018/Number of times they have been on the agenda**

Themes	Number of times they have been on the agenda	Sub-themes
1. Operational Rules	201	Rules of operation that apply to the Council and the Technical Chambers, defined throughout the activities of the CNRH itself, mostly regulations and composition. Also included Work Plans and Budget of the Management System, which are approved annually.
2. Management Tools	100	National Plan or Watershed Plan of Union domain – 24 Framework – 4 National Information System – 4 Water Allocation – 18 Water Charges – 39 National Hydrographic Division, coding, classification – 6 Monitoring – 3
3. Integrated Water Management	32	An approach that strengthens that water management should take place without physical barriers, being thought in an integral way, whether in its superficial, underground, freshwater, brackish or saline (coastal) availability: Groundwater – 11 Coastal water – 6 Pollution – 4 Protection – 2 Degradation – 1 Sustainability/integrated management – 4 Relationship between basins – 2 Minimum remaining flow – 1 Dominiality – 1
4. Sectoral Articulations	19	Focus on other policies interrelated with water management, such as: Sanitation – 5, Spatial Planning (mining and works that go beyond the domain of a state) – 8 Food Safety: Zero Hunger, Zero Headquarters – 2 Aquaculture and fishing – 1 Dam Safety – 3
5. Environmental Education	7	Celebration of environmental facts, capacity building of water basin committees' representatives and specific educational activities.
6. Scenarios	16	Presentation of a scenario where specific subjects are included, such as droughts, shale gas exploration, dam ruptures, transposition of São Francisco River, government programs and the National Water Plan.

Source: adapted by CNRH (2019).

and sustainability (4) altogether, six mentions. The reduced presence of these themes indicates little interest in environmental and ecosystem issues.

As to sector articulations, which seeks to evaluate the incidence of discussion on public policies related to water within the CNRH, 19 insertions were found, and basic sanitation is mentioned only 5 times in the agenda, and not as policy integration, but in information, or in initiative or approval of another law. The territorial issue is presented 8 times, mainly from the perspective of mining exploration or impact of construction works between more than one state. The topic of food security comes as a presentation of national programs or demands of the aquaculture and fishing sector (once), and these were occasional discussions that did not lead to joint action between ministries or policies.

To conclude this topic, environmental education arises with a certain regularity, but not from the perspective of a National Program that mobilizes the plenary and the States. We categorize as “presentations” those themes of extreme importance, which were not deepened or even forwarded to the Technical Chambers to be analyzed — as the cases of the transposition of the São Francisco River, exploration of shale gas, actions to minimize the effects of the rupture of dams and the drought in the Southeast (2014/2015) and Northeast.

It is also relevant to consider that the Council is a deliberative forum (article 1<sup>st</sup> of its Internal Rules), so its decisions are supposed to become effective after approval. The guidelines, or themes to be discussed and deliberated, are proposed by the representatives of the Executive, and the choice is for those issues of technical-administrative nature, excluding most controversial and with a political type. What is to be observed, alongside the documents raised, is that those issues where the Executive does not have full autonomy to conduct the process, is not taken to deliberation. Thus, the discussion of strategic issues, such as water crisis, are not debated in its importance, as alternatives or emergency action plans are not discussed within the Council.

As a complement to Table 1, we can see several graphs (Figure 1) that demonstrate in quantitative and temporal approach, the incidence of those themes related

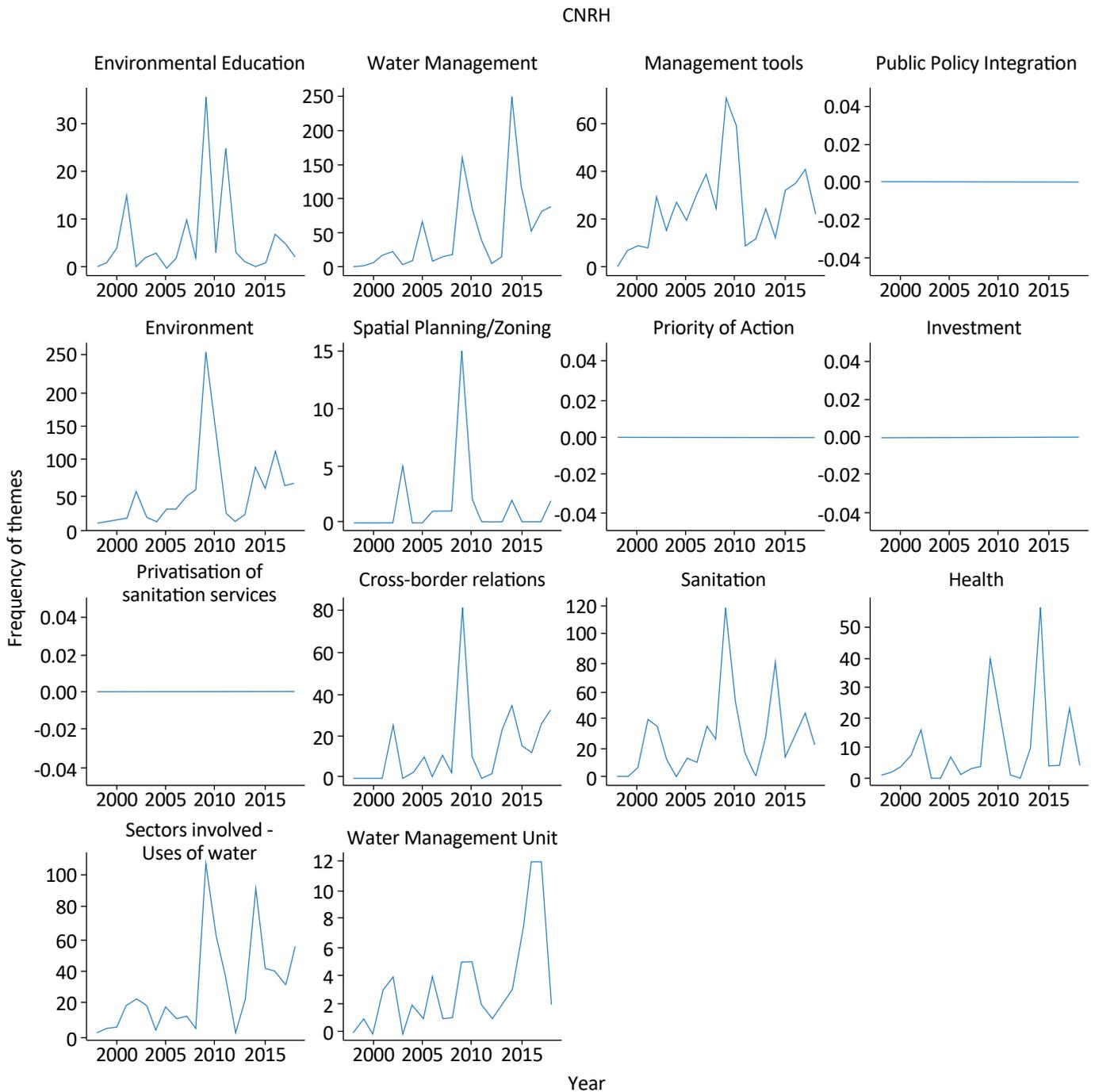
to integration and sectorial policies in the discussions, that identified by Program R, which processed all 81 minutes of CNRH from 1998 to 2018 and obtained this set of graphs:

Considering these outcomes, it is observed that “integration of public policies” does not express itself, only at the moments when sectoral policies are cited nominally. The incidence of discussions on the environment is very low or non-existent, having its peak in 2010, when the guidelines of CNRH were focused on deliberations linked to integrated qualitative and quantitative monitoring for groundwater; management of the Guarani Aquifer; Water Resources Plan on the right bank of the Amazon River; minimum remaining flow or ecological flow. Land use planning was highlighted in 2009, focusing on mining issues. Sanitation is a recurring theme, with an emphasis in 2007, when the Law no. 11,445, that establishes the guidelines for basic sanitation, was approved. The health issue is expressive in the debates that took place between 2013 and 2014 when the guidelines on artificial recharge of aquifers, extraction of shale gas and drought in the Southeast and Northeast were prevailing.

Thus, what emerges is that most discussions at CNRH are focused on administrative issues and on the regulation of the system itself, not effectively discussing means to articulate policies that have a common focus, such as water. It is worthwhile to explore and identify the existence of a relationship between members of different portfolios and public policies, which within the Council may become closer and stimulate articulations between policies.

The systematization of the themes discussed in sessions of CNRH converges with aspects raised by Senra on IWRM. The author highlights:

Despite the importance given to the principle of integrated management of public policies, in practice, it occurs little in Brazil, regardless of the level of government. IWRM is still little effective and its governance process, in 20 years of its implementation, it needs to improve significantly, as well as the whole process of social control of other policies and sector plans (SENRA, 2018).



Source: adapted by CNRH (2019).

**Figure 1 – Representation of the frequency of discussion of strategic issues and public policies related to water during Conselho Nacional de Recursos Hídricos (CNRH) meetings.**

### Need for improvement and case studies

The outcomes obtained raise two major questions. The first is related to the need to break with the trend of insulation of the different policies. The second is how

to improve water management so that Councils can promote more openly dialogues, encouraging a collaborative perspective of different angles.

One cannot ignore that the current situation as to environmental and water policy in Brazil is not the most promising, since the most strategic spaces for debate of guidelines and actions, the Councils, are under scrutiny by other vested, that confront those on environment and water. Recently, the structure of the Council was modified by Federal Decree No. 10,000 of September 3, 2019. The number of seats on the Council has been reduced to 37, with ministries going from 27 to 19 incumbent representatives and, according to data presented by the Water Governance Observatory — OGA (4/9/2020), the new composition reduces the participation of 10 to 9 representatives of the State Councils, the user sector from 12 to 6, and civil society organizations from 6 to 3, linking the representativeness of Non-Governmental Organization (NGOs) to those who are members of river basin committees under the Federal control. In addition, distortions are maintained, such as the representation of River Basin Committees being foreseen in the list of civil society representations and the maintenance of the majority of the Federal Government, which now can deliberate *ad referendum* without any review by the plenary.

This indicates that, if with the recently existing representation there has been already a reduced agenda, with this intervention, the tendency is to have an even greater impact on the effectiveness of the policy, with fewer debates on issues that should be on the agenda, such as water safety, which has become increasingly relevant, both from the point of view of water quality and quantity, due to the ever-growing effects of climate change (JACOBI; TORRES; GRESSE, 2019).

The recent water crisis experienced by the population of several municipalities of Paulist Macrometropolis,

composed of 174 municipalities within the State of São Paulo, brought evidence of the fragility of the current water management system. The lack of integration of actions in response to the region's water vulnerability indicates that water management has not been effective and that new forms of participation and collaboration among sectors and stakeholders are needed. In addition, the water management system has shown not to be prepared for the impacts of climate change.

Transforming water-social relations to pursue water security implies allowing people and organizations to become significantly involved in water governance, not only as water users but also as political actors (EMPINOTTI; BUDDS; AVERSA, 2019). As Jepson *et al.* (2017) point out, this implies a shift in the focus of water security interventions far from water supply and towards the nature of water-social relations. According to Linton and Budds (2014), this indicates the need to rethink the structures and decision-making processes for water security interventions, and to focus on the interventions and their impacts on social structures and orders at different scales (LINTON; BUDDS, 2014).

In understanding governance as a process that involves decision-makers and non-decision-makers with a common purpose, it is necessary to promote strong decentralized and co-responsible participation as the main point of the process. This requires network performance, integrated collaboration and empowerment of those actors involved in management, interacting with decision-makers in the negotiation spaces. At the same time, educational practices and the participation of civil society should be widely considered, contributing to the process of building shared decision-making (JACOBI, 2012; PAHL-WOSTL *et al.*, 2012).

## CONCLUSION

If the guidelines are limited and if the planned management tools, as well as principles of integrated management and articulation, are not sufficient to stimulate effective action and discussions on real problems that each region of the country experiences, new strategies must be thought to improve management. This implies either to deal with the usual themes, which are related to what is foreseen in the policies, or to reduce the impacts of uncertainties and the scope of the recurrence of extreme events.

This raises a fundamental issue related to the demand for greater proactivity from all board representatives. The various sectors of society and the State represented at the CNRH will need to join efforts to strengthen global agendas consistent with their institutional or sectoral, and concerns in an integrated manner with water policy. For this, it will be necessary promoting effective progress in the democratic governance of water, emphasizing policies that reduce liabilities and

deficits, encouraging policy articulations in a transparent way with accountability.

The various representatives of State Councils, in turn, need to be committed to discussing those most pressing issues they face in their territories, so that CNRH becomes an effective national forum and a space to exchange experiences, that lead to solving problems and deficits, rather than a forum of agendas that emphasize rules with very little dialogue with the major problems that arise from the disarticulation of policies.

On the other hand, entities representing organized civil society need to be better prepared and strategically articulated to follow the debates and stimulate agendas that include as well the environmental and business perspectives in an explicit and non-reactive way.

Thus, it is understood that the possibility of developing integrated programs and with joint budgets can

result in an efficient process to integrate, articulate and define the best coordination for water governance, and also emphasize its adaptive and participatory dimension.

From the perspective of water security, there is a need to promote a new paradigm for water governance, in which the articulation of actions based on a new strategy of integrated, adaptive and participatory management prevails. This requires considering society as a key player both in decision making and in social control of the decisions to be implemented.

One of the greatest challenges of water governance is to ensure an open and transparent, inclusive, communicative, equitable and ethical approach. Thus, the creation of conditions for a new proposal of dialogue and co-responsibility must be increasingly supported in educational processes oriented to “public deliberation”.

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