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Article

Comparison of Water Resource Policies between Brazil and Italy

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Abstract: The growing need for water has pressured society and governments to focus more on preservation, planning and management of this natural resource, in which is fundamental to ecosystems and especially to humans. In this sense, the goal of this study was to analyze the national policy of water resources in Brazil and Italy, figuring out aspects that could promote its improvement, aiming at the preservation of water sources, guaranteeing satisfactory quantity and quality. They were carried out in 2019 by the environmental agencies of both countries, listing the main disciplinary regulations. The results show that although they are countries with different realities, they resemble similarities in managerial aspects of water resources, with legislation addressing qualitative and quantitative aspects of water, with guiding principles, instruments and actions aimed at the defence of this natural resource.

Keywords: water management; planning; water resources; water sustainability policies, water laws.

1. Introduction

Air Water resource is a relevant subject of the environmental crisis, and one of the main challenges faced by humanity. The uneven distribution on the earth's surface; factors related to waste and mismanagement; the increasingly alarming context of pollution and contamination of water resources; and population growth, especially in developing countries, is a crucial concern of public officials and society.

Macedo [48] in his book "Waters and Waters" describes the importance of this natural resource. The UN is warning that by 2025, almost two third of the world population will live in metropolitan areas, causing serious supply problems. According to UN [57] the expected human population will be around 8.6 billion by 2030, 9.8 billion by 2050 and 11.2 billion by 2100.

In this sense, there will be a strong need for a proper management of water resources, allowing different uses, ensuring desirable quantity and quality. Many actions could be taken, such as reevaluating the development sample, the pattern of consumption, the unequal distribution of wealth and the employee technological standard.

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The principle of sustainability implies the use of renewable resources at rates equal to or less than its regeneration. Water sustainability mainly implies in maintaining a dynamic balance between supply and demand for water.

This justifies the need for studies to sustainability perspective in the use of natural water resources, taking advantage of the resulting stimulation of the creation of the legal framework that supports the management of water resources.

That way, the legislation constitutes a fundamental instrument in establishing specific policies for water resources and how to run the planning and management.

In this sense, we compared the policies of water resources between Brazil and Italy, enabling improvement within the planning and management mechanisms of these countries, and by meeting the ecosystem support capacity.

2. Materials and Methods

In both countries, environmental agencies were the main sources of consultation in 2019. In Brazil, the main sources were the National Water Agency (ANA) and the National Water Resources System, while in Italy the information base was consultations through the European Environmental Agency - EEA, the Institute of Environmental Protection and Research - ISPRA and the National System of Environmental Protection and the data expressed in tables and figures that illustrate the results obtained.

3. Results and discussion

3.1 Principles of water governance

In Latin America there are three ways of water governance in their environmental policies, that is, community management (Ecuador), social control (Venezuela) and social participation (Brazil). The water governance in Brazil begins with the conceptual, theoretical and operational building in the National Water Resources Policy, through Law n. 9433 1997 [59]

According to Rogers and Hall [55], the notion of a satisfactory governance starts with the following principles: participation, transparency, equity, accountability, ethics and sustainability.

a) Participation: all citizens, directly or through representatives in all stages of the formulation process, as well as in decision-making spaces. This requires the government to act, at all levels, from an inclusive approach.

b) Transparency: information should flow democratically within society. The different processes and decisions should be transparent and susceptible to criticism.

c) Equity: all social groups should have the opportunity to improve access to common goods.

d) Responsibility: government organizations, the private sector and civil society must be accounted for the interests they represent.

e) Consistency: the increasing complexity of issues related to water resources requires appropriate and coherent policies.

f) Sensitivity: institutions and processes must meet all and respond appropriately to the changes that are necessary.

g) Integration: water governance should promote comprehensive and holistic approaches.

h) Ethics: water governance must necessarily be sitting on ethical principles that underlie the societies in which it is applied.

i) Sustainability: requires in its applicability an ecosystem vision, for the maintenance of aquatic ecosystems is essential for continuity of life [55].

The sustainability of territorial spaces is not easy, especially in regions which depend on others, because it is difficult to estimate the demand for the natural resource.

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This interdependence is larger than the spatial scale of analysis, for example, a country tends to be more self-sustaining in resources than a small watershed. To be more understandable, one can say that a territorial space is sustainable "if it is able to maintain the balance between supply and demand for natural resources" [50].

Santilli [56] reveals that several Treaties and International Declarations (especially the Declaration of Dublin, Ireland, 1992) have stated expressly decentralization in the management of water resources, to harmonize participatory integration of public management boards, private and citizens interested in the use and conservation of water.

3.2 Policy of water resources in Brazil

The management of water resources is not a recent phenomenon in Brazil, but it is associated with the Portuguese colonization [31].

Imperial Constitution in 1824 came up with Brazil's independence and did not address the protection of water. Article 162 of the Penal Code of 1890 related to water protection with the right to Safe health [4].

The Civil Code of 1916 mentioned about water, only regulating the right of use in relation to the right neighborhood. Water was considered as a limited economic value and private domain [53].

The Federal Constitution of 1934 provides in its article 5, subsection XIX, letter "j" Racing privately the Union to legislate on water [5].

In 1934, the National Congress of Brazil, through Decree 24643 promulgates the Code of Waters [7]. The first legal instrument disciplining the planning and management of water resources of the Republic. Addressed water types, forms of exploitation, measures in case of contamination of water bodies, criteria for use of water by industries. Costa e Silva et al [22] considered that the aim of the Water Code was to empower the Ministry of Agriculture to protect water resources, noting the agricultural vocation of the country.

The 1946 Constitution defined the water as a state and union property. The lakes and streams in Union land, which cover more than one state, also work as a border for other countries or which extended to other foreign territory, were considered to be assets of Union. The states had in their lakes and rivers domain on state land and with source in the province [54].

Within the following decades, especially with the occurrence of environmental movements, is part of the Brazilian Federal Constitution of 1988 with the prospect of creation of the National System of Water Resources Management. The Brazilian Constitution of 1988 introduced the chapter on the environment [6], the light of Federal Law 6938 of 1981 establishing the national environmental policy [9].

Art. 225. Everyone has the right to an ecologically balanced environment and of common use and essential to a healthy quality of life, imposing to the government and society the duty to defend it and preserve it for present and future generations [6].

The constitutional guidance of 1988 and the report of the International Conference on Water Resources and Environment (1992) played an important role, so that in 1997 a federal law n. 9433 could be approved, establishing the national water policy. In 1998 comes the Environmental Crimes Law [11]. Carvalho [20] well exposes water legislation.

The reports of the National Water Agency – ANA [2], the conference held in Dublin, highlighted four basic principles: (a) The effective management of water resources should cover surface and groundwater resources, always with the river basin as the basic unit of development ; (b) The development and management of water resources should be based on a participatory perspective, involving users, planners and policy makers at all levels (c) The woman has a central role in managing the provision and protection of water (d) water has an economic value in all its competing uses and should be recognized as an economic good.

The guiding principles of the Brazilian law, well influenced by the foregoing are the foundations necessary for its implementation:

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Art. 1 The National Water Resources Policy is based on the following grounds: I - water is a public good; II - Water is a limited natural resource with economic value; III - in situations of scarcity, the priority use of water resources for human consumption and watering livestock; IV - the management of water resources should always provide the multiple use of water; V - the river basin is the territorial unit for implementation of the National Water Resources Policy and activities of the National Water Resources Management System; VI - the management of water resources should be decentralized and include the participation of the Government, users and communities [10].

Such foundations have enabled the design of five planning tools and fundamental water management: water resources plan, grant use of water, collection, classification and information system:

Art. 5. The instruments of the National Water Resources Policy:
I - Water Resources Plans;
II - The framing of bodies of water into classes, according to the main uses of water;
III - The granting of water use rights;
IV - Charging for the use of water resources;
V - The Water Resources Information [10].

The water resources plans are aimed at making diagnosis and prognosis, being developed at the federal, state and river basin level. According to ANA [3] until the end of 2017, 158 plans of state watersheds were prepared in 16 Federative Units and 32 plans were under preparation in 10 Federative Units (Acre, Bahia, Espírito Santo, Minas Gerais, Mato Grosso, Pernambuco, Paraná, Rio Grande do Sul, Santa Catarina and São Paulo).

The frame bodies of water refer to the classification of watercourses into classes, having the desired predominant use. ANA [3] in 2017, Brazil had 1,625 quality monitoring water points in all Brazilian states. The classes were defined by 357 in CONAMA: Special, 1, 2, 3 and 4.

The grant corresponds to the right of a certain volume use of a specified time and it can also be earned for effluent discharge. According to ANA [3], within the set of federal units of Brazil, more than 75,000 licenses were issued and found to be valid on July 2017, for a total flow of more than 2.5 m^3 / s.

The charge relates to taxation of the use of water as a resource of nature for the withdrawal or the quality of effluent released. It aims to encourage the rational use of water and guarantee funds for investments in the watershed.

Finally, the information system aims to train and qualify the agents involved in the process as well as the community.

It was established the National System of Water Resources Management - SINGREH where state, municipal and National boards are involved. However, the full power was directed to the Union and the States to legislate within the established limits of competence.

Art. 33. integrate the National System of Water Resources Management:
I - The National Water Resources Council;
II - The Water Resources Councils of the States and the Federal District;
III - Committees of the basin;
IV - The public federal, state and municipal board, in which responsibilities relate to the management of water resources;
V - Water Agencies [10].

Special emphasis should be given to river basin committees that are real "water parliaments", performing decentralized and participatory management, and the basin agencies, operational support of the deliberations. According to ANA [3], there are already nine committees of federal watersheds and 224 state watersheds.

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In 2000, was created the National Water Agency according to Law n. 9984 [12], the board responsible for the coordination and discipline in planning and management of Water resources; In 2018 the provisional measure adds to this board normative role of national character in the provision of public sanitation services.

Provides for the creation of the National Water Agency - ANA, federal entity implementing the National Water Resources Policy, coordinating the National System of Water Resources Management and responsible for the establishment of national reference standards for regulating the provision of public services sanitation [18]. The following year, the National Water Resources Council established the National Hydrographic Division into 12 regions (Figure 1), according to the resolution n.32 of 15 October 2003 [8].

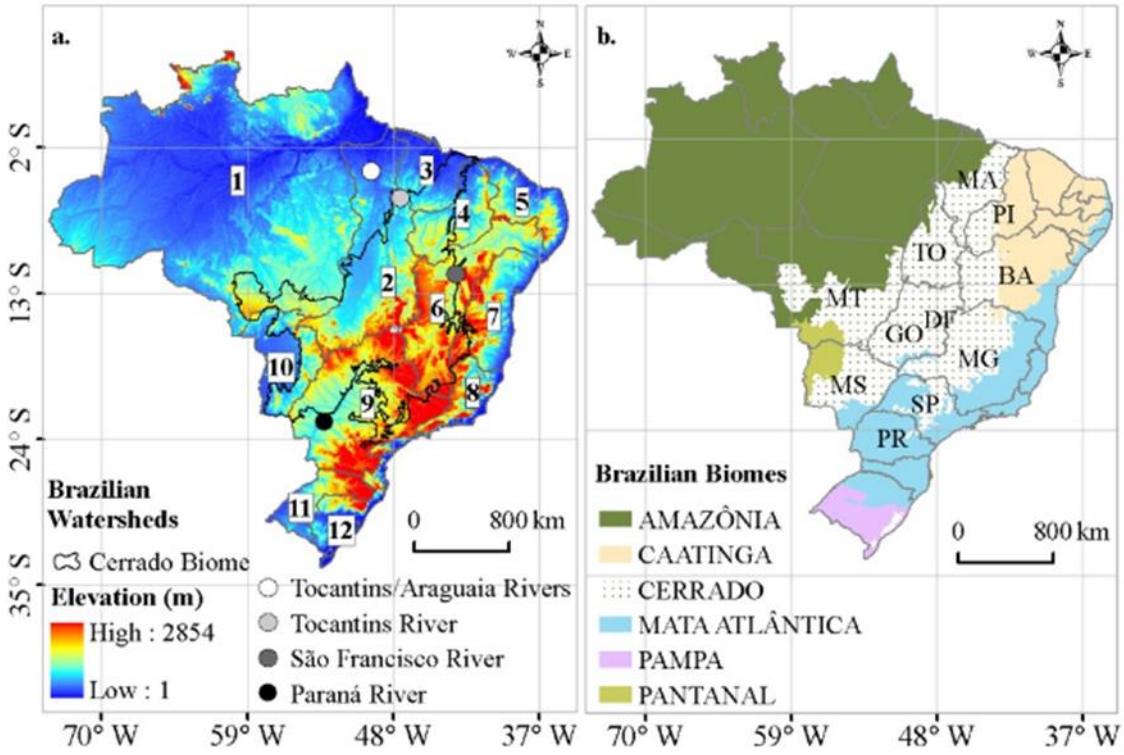

Figure 1. Hydrographic Regions of Brazil: 1. Amazon; 2. Tocantins; 3. Western Northeast Atlantic; 4. Parnaíba; 5. Eastern Northeast Atlantic; 6. San Francisco; 7. East Atlantic; 8. South-East Atlantic; 9. Parana; 10. Paraguay; 11. Uruguay; 12. South Atlantic. Fluviometric stations represented by circles. B. Biomes.
Source: Oliveira et al. [51].

In 2005 the National Environment Council - CONAMA issues the resolution n. 357 [13] which established standards framework of water bodies and sewage discharge. With subsequent amendments, in 2011 the standard of effluent discharge is redefined by CONAMA resolution n. 430 [15].

Another important milestone refers to the year 2007, with the creation of the Federal Law n 11,445 [14], national sanitation policy, considering the set of services, infrastructure and water supply facilities, sanitation, urban sanitation, management solid waste and drainage of urban rainwater, also restated by Provisional Measure n. 868, [18].

In 2017 Consolidation Ordinance No. 5 sets the potability standard [17].

Establishes national guidelines for basic sanitation, creates the Sanitation Interministerial Committee Basic amends Law n. 6,766, of December 19, 1979, Law n. 8,036, of May 11, 1990, Law n. 8666 of 21 June 1993, and Law n. 8,987, of February 13, 1995, and repealing Law n. 6528 of 11 May 1978 [18].

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In 2019, changes within the administrative structure of the Federal Government were transferred to the National Water Agency - ANA's Ministry of Environment to the Ministry of Regional Development, started a new stage in the management board, but also received criticism from social organizations.

Also forms of financial compensation, those that preserve water springs, water resources or possess properties that provide environmental services are expressed in the forest code, law n.12.651, of May 25th, 2012 [16].

3.3 Policy of water resources in Italy

There has been a great concern about water for quite some time, that's why the Royal Decree n. 264 of August 10th, 1884 had already established some type of discipline over the water [35].

Subsequently, the Italian Constitution in Article 117 states:

> The legislative power of the Member States and the Region of the Constitution risks as well as the bonds arising from the Community and international obligations [36].

The State shall exercise exclusive legislation in certain issues, especially aspects related to environmental problems.

> s) protection of the environment, the ecosystem and cultural heritage [36].

Similarly, Italy has its regulatory mechanisms. You can highlight important moments in the planning and management of water resources in Italy.

In 1989 the law 183 established the "Basin Authorities" joint body [37], agreed among states and regions, operating in the watershed, considered planning and management units in defense of the soil and subsoil, the use and management water resources, regardless of the administrative subdivisions, that is, watersheds are considered inseparable physical units in which is the diagnosis, prognosis and actions to protect, defend and improve existing resources.

This innovation within the legislation is evident throughout the efforts of Professor Giulio De Marchi, who chaired the committee in 1966 creating the prerequisites for expanded and integrated view of planning and based on the watershed.

Data collection were performed, identification of rivers and basins, as well as development and implementation of projects, with limited operation by the resistance of local governments who wished to administer the territory more freely and without any authorization from "Basin Authorities".

The basin authority is a local consultation between institutions and entities involved in the planning and management of territorial unity, overcoming the fragmentation of skills and institutions that do not allow the integrated and sustainable planning.

Bringing "basin authority" to life was and is a way to join all actions within the territory. By doing so, Italy was divided into river basins, with different territorial levels of importance: national, interregional and regional.

Another important milestone is the law 36 of 1994 [38]. In essence, it already highlights that the first item is that the protection belongs to the state, as well as concern for the rational use, ensuring to future generations the use of the resource.

> 1. All surface and groundwater, even though not drawn from underground, are public and are a resource that is safeguarded and used in accordance with the criteria of solidarity.
>
> 2. Any use of water is carried out safeguarding the expectations and rights of future generations to enjoy a full environmental heritage.
>
> 3. The water uses are intended to save and renew resources so as not to compromise water resources, environmental housing, agricultural, aquatic flora and fauna, geomorphology and hydrological equilibrium processes [38].

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Continues and reinforces the priority to the human being as a condition "*sine qua non*" the legal prerogative.

The use of water for human consumption has priority over other uses of the same body surface or underground water. Other uses are permitted when the resource is sufficient and do not adversely affect the quality of water for human consumption [38].

They describe the procedures and actions aimed at promoting integrated water service and radical restructuring in funding sectors, distribution and treatment of water, replacing the existing aqueducts mosaic by networks whose dimensions and management were more current.

In 1999, Act 152 addresses the responsibility for water pollution [39], important point of view about quality, however this new law had difficulties to be implemented because collided with the interests of organizations and production cost. The necessary measures for the quantitative and qualitative management of the water system, the regional and watersheds are part of it.

Concerned with the issue of water resources Directive 2000/60 / EC of the European Parliament and of the Council of October 23rd, 2000 establishing a framework for Community action within the field of water [52].

For Machado [49] citing Kallis and Butler (2001), Page and Kaika (2003), White and Howe (2003), Carter and Howe (2006), Wiering and Immink (2006) and Carter (2007) the management system promoted from the Directive 2000/ 60 is based on the following principles:

1. The principle of integration, whereby the entire surface and groundwater must be protected by a systemic management performed together with the management and sector or regional policies;
2. The principle that water management should be set on the hydrological unit watershed, not on political-administrative divisions; 3. The principle by which states and municipalities (or regions, provinces, comunes, as used in Italy) has an obligation to ensure good water quality, prevent degradation / pollution, reduce the amount of waste produced and to eliminate generation potentially hazardous waste;
4. The principle of joint work (including research) in order to avoid shortages and pollution of water based on the establishment of effluent emission limits and control of point and diffuse sources of release;
5. The principle of sustainability by seeking a use economically, ecologically and socially sustainable use of water resources;
6. The public cooperation principle for the creation of policies that provide participatory watershed management through active participation or consultation of stakeholders;
7. The principle of transparency in relation to the use that is made of water (Bonus) and on the division of losses (Lien, costs and environmental damage) arising from these uses. In this case it applies the principle of "polluter payer". [49].

Among the instruments used in Italy, we highlight the River Contracts. The contracts are instruments of integrated management, territorialized and participatory water resources which are intended to explicit purpose of execution, on a local scale, the goals are based on the European Policy water 2000/60 / EC (water Framework Directive / WFD) [49; 27].

In Italy the legislative decree of April 3rd, 2006, n. 152 [41] and subsequent amendments, work as an environmental code, and it deals with the defense of the soil and fight against the waste; water pollution and water resources management. In which the articles 63 and 64 are inserted respectively to the basin authorities and hydrographic districts. It comprises standards for the "Trusteeship Plan of Water" (PTA2) approved on March 2007 by Decree 117-10731, which provides for the use of the instruments called "Negotiated Programming".

According to Machado [49] The "River Agreements" were inserted within this set of instruments (*Contratti di Fiume* - CDF), established in Article 10, which aim to encourage the participation of all major subjects in the territory of the river basin to be managed for the definition and implementation of integrated actions in order to overcome the fragmented environmental vision.

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It was created the Directive 2007/60 / EC of the European Parliament and of the Council of October 23rd, 2007 relating to the assessment and management of flood risks, promptly backed in Italy by Legislative Decree 23 February 2010, n. 49 [42].

Provisions for environmental issues to promote green economy and measures to curb the excessive use of natural resources have led to new legislation, and the art. 51 paragraph 2 of the Law of December 28th 2015, n. 221, [44] replaced in its entirety Articles 63 and 64 of Legislative Decree of April 3rd 2006 establishing the basin plan as an important tool for planning and management of water resources. In article 64 defines the river basin (Figure 2)

Figure 2. Districts or Hydrographic regions in Italy.

Source: Italy, Law 221, [44]. Ministry of the environment and the protection of the territory and the sea, [46].

The hydrographic districts extend to more than one basin at different national, inter-regional and regional levels or listed in quantity in brackets: Hydrographic District Alpiorientali (4); Hydrographic District Fiume Po (7); Hydrographic District Appennino Settentrionale (5); Hydrographic District Appennino centrale (8); Hydrographic District Appennino meridionale (14); The river basin of Sardinia (1); Hydrographic district of Sicilia (1) [44].

Subsequently, the Ministry of Environment Protection and Land and Sea of October 25th 2016 established allocation regulation and transfer to the district authorities of human and instrumental resources, including offices and financial institutions of the basin authorities [45].

To make it easier, to support, to rationalize the use of public money, improve competitiveness and ensure more effective environmental protection, it is established in 2008 the Institute for the Protection and Environmental Research - ISPRA, operating since 2010, with the decree of May 21st, 2010 n. 123 [43], which defines the fusion within ISPRA three entities controlled by the Ministry of Environment and Territorial Protection and the Sea

The ISPRA in technical and scientific functions, both to support the Ministry of the Environment and for the protection of the territory and the sea, and directly through monitoring activities, evaluation, control, inspection and management, Environmental information. Dono et al. [26] describes sustainable management of water resources in the face of climate change. Ferrante and Sciacca [30] specifies sustainable management of water resources in Italy.

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Concern for water comes from the European Environment Agency in several studies [29; 30], but Italy plays a key role. It was created in 2017, the National Environmental Protection System, a network that aggregates the institute, the 19 regional agencies (ARPA) and two autonomous provinces (APPA) and which ISPRA is coordinated, also in charge of cooperating with the European Agency environmental and other international environment.

In 2018 the *report Environment* to the ISPRA [34] expresses the efforts made in research on the subject and strengthen the environmental Italian system.

3.4 Actions and outlook

In Brazil and Italy, actions aim to monitor the quality and quantity of water resources. In Brazil, states and country play an executive role with their state and federal water resources plans, as well as river basin plans. In Italy, there is a predominant role of river basin assemblies, called river basin committees in Brazil, allowing self-management of social subjects/agents.

Table 1 shows a summary of the hydrographic regions in both countries, as well as an administrative organization in 2019.

Table 1. Summary of the administrative and river areas in Brazil and Italy.

Countries	Geographic region	Administrative region	State	Province	Municipality or Commune	Region or Hydrographic District
Brazil	5	-	26[a]	-	5568	12
Italy	4	20	-	107[b]	7926	7

Source: the author based on data Databasi communi [24]; Brazil [8]; Italy [44]; IBGE [33].

[a] = 26 states and one Federal District

[b]= The Italian territory is divided into 107 territorial areas and 100 administrative bodies of second level (80 provinces, 14 cities and metropolitan 6 free municipal consortia in Sicily) two autonomous provinces of Trentino-Alto Adige.

Brazil and Italy organized a national water resources system that allows the construction of information networks and inter-sectoral coordination, especially ANA and ISPRA entities respectively within federal bases. In these countries the priority challenges are fighting water pollution, rationalize its use, mitigate drought, prevent critical situations; and have contingency plans if necessary.

Water quality is an aspect that the Brazilian legislation includes effluent discharge standards in CONAMA 430 resolution [15] as the possibility of granting the qualitative aspect of these; without considering, of course, the laws that define standards of potability of water for public supply in the order of the Ministry of Health n. 5 [17]. In Italy the Legislative Decree 31 [40] establishes standards of water potability, while the Legislative Decree 152 [41] deals with the planning and management of water resources.

Special attention in the case of Brazil should be facing drought events that compromise the water supply in regions such as the Northeast. Water Security Plans should be developed and operated. Mechanisms for granting and collection of water use as a natural resource must be improved. It is already being discussed the possibility of collective grant as a tool for user's participation. It is important that warning systems may be inserted within laws or even water resources plans. *Consorzio Alp Water Scarce* [21] reports that the establishment of early warning systems against shortage of water resources should be envisaged into this law.

Recently, the change of the National Water Agency - ANA to the Ministry of Regional Development, out of the Ministry of Environment was not well received by environmental groups, despite of have received powers to set policies aimed at the effluent. Movement of civil society organizations, called National Observatory for the Rights to Water and Sanitation was created in 2019 to act in defense of water and promotion of sanitation in Brazil.

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In its turn, the European Parliament [53] describes that the European Framework Directive Water is complemented by specific directives, such as groundwater, drinking water, bathing water, nitrate, waste water, the environmental quality standards and floods. The European strategy on water resources objective: a) to protect and improve the water quality of aquatic ecosystems; b) ensure the availability of a proper amount of water whenever and wherever needed; and finally; c) promote sustainable water use based on long-term management.

The planning and management should be supported on key principles such as: a)the water is public; b) balance between supply and demand, considering the ecosystem support capacity; c) the quality and quantity of water are priority to human life.

To enable the above command and control instruments, such as legislation, inspections are essential from the perspective of conservation and monitoring of water resources. The polluter-payer principle should be applied to those who insist on disrespecting the laws and the natural balance. As well as, special attention should be given to preserving-recipient principle should exercise stimulus function to the practices of make available greater supply of water as well as better quality.

Vidale et al. [58] deals with the payment for environmental services in Italy. In Brazil, the law n. 9,605 of February 12th , 1998, establishes punishment for causing environmental damage, considering a crime [11]. Mechanisms for collecting the water as a resource of nature and not just payment for treatment performed, has set an important source of money for the operation of basin agencies and serving the educational process to users. It also adds increased stimulation to preserver-recipient principle makes up for those payments that improve environmental services, especially with producer program of water.

Cost reduction, optimization of resources, integration and territorial focus in the watershed are targeting strategies focus in planning and management of water resources. Below, there is a list of priority actions within the European Union, as well as its members, in the case of Italy.

- improve the implementation of legislation; - the integration of environmental concerns into other sectoral policies; - inducing the market to work for the environment; - participation and civic responsibility; - more ecological planning and land management; - High level of protection - the precautionary principle - Preventive action - damage correction to the principle source of the polluter pays - integration of this policy into other Community policies - use of scientific and technical data currently available - variability of environmental conditions in the community regions - cost / benefit - socio-economic development of the Community - international cooperation - subsidiarity [23].

In Italy, recently the Ministry of Environment and Land and Sea Protection, through the 2019-2021 report, shows us ways to identify policy priorities and actions to be performed.

> Support and implement the commitments and agreements made at European and international level for sustainable development; 2. Strengthen and systematize policies and programs on climate and energy, with special attention to sustainable mobility and energy saving; 3. Increase the protection of terrestrial biodiversity and the Mediterranean and ensure a better and more coordinated management of protected areas and natural capital; 4. Strengthen measures to combat hydrogeological instability, improving the protection of water resources to be valued as a common good and a universal human right, to fight the consumption of the earth; 5. Enhance the security of the territory, recovery activities and environmental rehabilitation of contaminated areas, as well as prevention and contrast of environmental damage and the country fires of lands; 6. Increase the effectiveness and the technical work on the work permits and environmental assessments, strengthen the relative transparency and participation system for citizens; 7. Improving waste management, to focus on reducing its production, promote circular economy, strengthen measures to prevent and combat pollution, with particular attention to air quality; 8. Reset and prevent infringement procedures concerning environmental issues, strengthening the participation of the system in EU policies, ensure correct implementation of projects and programs financed with European funds [46].

It was held in 2018 for the first time, the World Water Forum in Brasilia, capital of Brazil, in its eighth edition. At the time, the National Water Agency - ANA [1] presented the legacy project with

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20 proposals for improvement of the constitutional frameworks, legal and infra-legal of water management in Brazil. The deliberations of the Forum, the highlights are the ten principles that become part of the Citizen Forum Legacy:

Principle 1. Water is a community well and a right of all beings and is essential for the guarantee of life in all its forms;

Principle 2 - water management must be committed to the eradication of water borne diseases, conflict and poverty, prevailing to the supremacy for the lives of people and nature over any other development interests.

Principle 3 - water should be ensured in quality and quantity through shared management.

Principle 4 - decision making in water management should be based on ecosystem paradigm in preventive and disaster management and pollution.

Principle 5 - the effective participation of society in water management depends on access to information, education quality and power in decision-making spaces and must then include the creation of enabling environments that encourage.

Principle 6 - countries should strengthen and ensure effective participation and social control in water management, developing mechanisms, procedures and policies with the inclusion of traditional communities.

Principle 7 - water governance should be cooperative, transparent and integrated management of groundwater and surface water in watersheds.

Principle 8 - the shared water management should be strengthened with the completion of joint constant in the relationship between the public and private sectors and civil society.

Principle 9 - water culture must be preserved by all and must be harmonized with the economy from the different environmental contexts.

Principle 10 - as a seed for the future, water management in all its aspects should consider women and young people in all its fullness [32].

These principles guide the focus of global policies on water resources, but it does not extinguish itself, because it demands concrete actions to be executed.

In regard to the methodological approach, innovation in the management of water resources and water services is not only about technological innovation, but also stems from the innovation of reference markets and innovation of the rules. In the case of markets, for example, manufacturing companies will have to adapt in not to sell just "products" but "services" based on their products. As seen below, it shows the importance of a strong collaboration between different skills, an open innovation logic, between technology providers, research, final users and policy makers [25].

Lima et al. [47] propose an analysis engine as a "governance thermometer" of actions in water resources, organized into five areas:

A. Institutional Environment (effectiveness of the law and importance of the issue to the public agenda); B. State capabilities (financial resources and quality of bureaucracy); C. Management Instruments (planning, targets, monitoring, indicators and evaluation of public policies); D. Intergovernmental Relations (inter-sectoral and intra-sectoral coordination, municipal participation in the system and federal forums); E. Interaction State Society (qualification and participation channels) [47].

Finally, the 9th World Water Forum will take place in Dakar, Senegal in 2021 addressing "Water Security". Until then, many actions within water defense will be made to benefit humanity.

4. Conclusions

It appears that there are directives, standards and laws governing planning and water resources management in Brazil and in Italy. The concern is long-standing, but it has intensified nowadays, due to higher risks of pollution and climate change that has affected the rainfall and water availability.

The growing need for public policies for the preservation and conservation of water resources has enabled the shared management, committees and preparation of watershed plans. Other important instruments are implemented, but attention should be made to policies that stimulate the conservative-recipient principle like the "water producer", without affecting the polluter-payer principle

The main destination of the water in both countries within the agricultural sector should be of great concern in order not to affect other uses, as well as the development of technologies that improve the efficiency in this and other sectors.

Recalling the definition of sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" [19], are the rights of future generations that will be benefitted by this precious commodity. If we do not do it by the knowledge and understanding of science then we must do it by penitence, in respect to the teachings of human solidarity.

The responsibility belongs to everyone, including the government, business, consumers, producers, research institutions, class entities and other institutions of civil society, therefore contributing to the reduction of environmental impacts of the use of water resources of the planet.

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