Political and institutional review for biodiversity financing in Brazil: a Biofin approach for the federal government

Revisão política e institucional para o financiamento da biodiversidade no Brasil: uma abordagem Biofin para o governo federal

Carlos Eduardo Menezes da Silva [1]

[1] *Master in Development and Environment, Professor, Federal Institute of Education, Science, and Technology of Pernambuco – IFPE. Recife, Brazil*
E-mail: carlosmenezes@recife.ifpe.edu.br

ARTICLE - DOSSIER

ABSTRACT

Institutions and their different management and governance configurations are increasingly related to the environmental changes experienced on the planet. Therefore, this study aims to conduct a political and institutional review of biodiversity within the Brazilian federal government. To do so, we use the Political and Institutional Review - PIR to assess the strengths and weaknesses of biodiversity-related policies and institutions as part of the Biofin methodology. The study raised the main elements of the normative and institutional landscape that guided biodiversity conservation actions at the federal level between 2000 and 2019. The results showed that in this period, at least 21 norms and about 195 instruments were provided in federal legislation to meet the National Biodiversity Strategy and Action Plan – NBSAP. However, most of the budgetary actions carried out by the management bodies of biodiversity policies at the federal level distort the guidelines in these listed norms, along with the observed reduction in budg*et al*location for the Ministry of the Environment and biodiversity actions in other ministries. These elements seem to point to reduced prioritisation for biodiversity conservation at the federal level in Brazil over the 20 years analysed.

Keywords: Biofin. NBSAP. Environmental Legislation.

RESUMO

As instituições e suas diferentes configurações de gestão e governança estão cada dia mais relacionadas com as alterações ambientais vivenciadas no planeta. Por isso, o objetivo deste estudo é realizar uma revisão política e institucional relativa à biodiversidade no âmbito do governo federal do Brasil. Para tanto utilizamos a Revisão Política e Institucional – PIR (Political and Institutional Review) como abordagem para avaliar os pontos fortes e fracos de políticas e instituições relacionadas à biodiversidade, como parte da metodologia Biofin. O estudo levantou os principais elementos da paisagem normativa e institucional que direcionaram as ações de conservação da biodiversidade em nível federal entre os anos de 2000 e 2019. Os resultados demonstraram que nesse período havia ao menos 21 normas e cerca de 195 instrumentos previstos na legislação federal para atender à Estratégia e Plano de Ações Nacionais para a Biodiversidade – EPANB. Porém, a maior parte das ações

orçamentárias realizadas pelos órgãos de gestão das políticas de biodiversidade em nível federal distorce as diretrizes previstas nessas normas elencadas. Juntamente com a observada redução da alocação orçamentária para o Ministério do Meio Ambiente e para ações de biodiversidade em outros ministérios. Esses elementos parecem apontar para um quadro de redução da priorização para o tema da conservação da biodiversidade em nível federal no Brasil ao longo dos 20 anos analisados.

Palavras-chave: Biofin. EPANB. Legislação ambiental.

1 INTRODUCTION

Institutional analysis has gained prominence in studying environmental problems (ROGGERO; BISARO; VILLAMAYOR-TOMAS, 2018). Human societies interact with the environment through institutions that are artefacts of social and political history. Variations of these interactions over time affect institutional performance with implications for the quantity and quality of available environmental resources and, consequently, for social well-being (VEEMAN; POLITYLO, 2003).

These institutions are the social decision-making systems that provide rules for the use of resources and for the distribution of resulting benefit flows (CIRIACY-WANTRUP, 1968). In other words, institutions are also considered the game's rules in our society (NORTH, 1990). Therefore, it is necessary to consider the preferences of individuals shaped by these institutions in the economic analysis of environmental issues. Institutions affect the choices and strategies in various social dimensions (TISDELL, 2005). It also affects the choices about biodiversity conservation strategies since the design of policies that effectively implement the provisions of the Convention on Biodiversity (CBD) requires: 1 - a clear understanding of the institutional economics of biodiversity; and 2 - knowledge about the research and development of processes related to its use, conservation and benefit sharing (POLSKI, 2005).

Within this scope, two necessary research focuses on institutions that govern the use and conservation of biodiversity have emerged. The first is that the governance of biodiversity involves a wide range of institutions that restrict and motivate interactions between human and ecological systems at different scales: from a gene to entire ecosystems. The second focus developed from the fact that these institutions often comprise several different governance structures, such as mechanisms based on incentives and reciprocal relationships that regulate different aspects of the human-ecosystem interface (PADMANABHAN; JUNGCURT, 2012).

These studies are essential because it is increasingly evident that institutions and governance systems are indirect causes of environmental changes. Due to their power to influence man's relationship with the natural environment, they are considered fundamental levers for decision-making. They establish, to varying degrees, access and control, allocation and distribution of components of nature and anthropogenic assets and their benefits to people (JOLY *et al*., 2019).

In this sense, many governments today implement policies aimed explicitly at biodiversity conservation, which suggests some level of concern with this agenda (VYRASTEKOVA; SOEST, 2007). These policies and concerns are not necessarily sufficient or efficient, even in developed countries.

Political and Institutional Review (PIR) is an approach used to assess the strengths and weaknesses of policies and institutions in a given sector. They focus on adapting existing policies, identifying gaps, translating policies into practice, and examining the functionality of existing institutional structures (UNDP, 2018). PIRs are practical systems analyses applied in many different industries. They seek to understand better the complexity of the factors causing biodiversity loss and their connection with financial flows. As nature interacts with so many economic sectors, a diverse set of factors must be analysed to understand and influence the current development trajectory to improve its biodiversity outcomes (UNDP, 2016).

The PIR analyses the relationship between the state of nature and a country's fiscal, economic, legal, political, and institutional framework to identify: 1) A better understanding of how managing biodiversity and ecosystem services support national goals and visions of sustainable development; 2) An understanding of the central policy and institutional drivers of biodiversity change; 3) A catalogue of existing biodiversity finance, listing and analysing its mechanisms, incentives, subsidies and other instruments, including sources of biodiversity revenue (UNDP, 2018).

More specifically, the institutional review examines the links between three dimensions: 1) policy; 2) institutional structures which execute policies; 3) The resource allocation processes by which public funding is made available for the implementation of relevant projects, programs, and policies (DENDURA; LE, 2015).

Although there is a large field of studies related to environmental legislation, there is only sometimes a connection between the evaluated norms and their relationship with the practical actions of governments. The relevant contextual and institutional factors that determine the State's responses still need to be studied (DUGGAN; CARR; YAN, 2022).

Analysing institutional issues related to climate change is gaining space in the economic and environmental literature (ROGGERO; BISARO; VILLAMAYOR-TOMAS, 2018). However, analysing institutional issues related to biodiversity conservation still needs to be explored. For this reason, it is necessary to highlight the current role of normative and institutional aspects in conserving biodiversity and Brazilian ecosystems. Therefore, in this article, we assess whether the normative and institutional arrangement at the federal level has undergone changes that may have contributed to reducing the effectiveness of biodiversity conservation policies in Brazil.

Thus, the present study carries out a political and institutional review related to biodiversity within the scope of the Brazilian federal government. It highlighted the main elements of the normative and institutional landscape that guided biodiversity conservation actions at the federal level between 2000 and 2019.

2 METHODS

For the elaboration of this study, we use the PIR execution framework. The cutout established for the evaluation was Brazil's federal level of government. The collection of information followed three stages (Figure 1) suggested in the Biofin manual (UNDP, 2016):
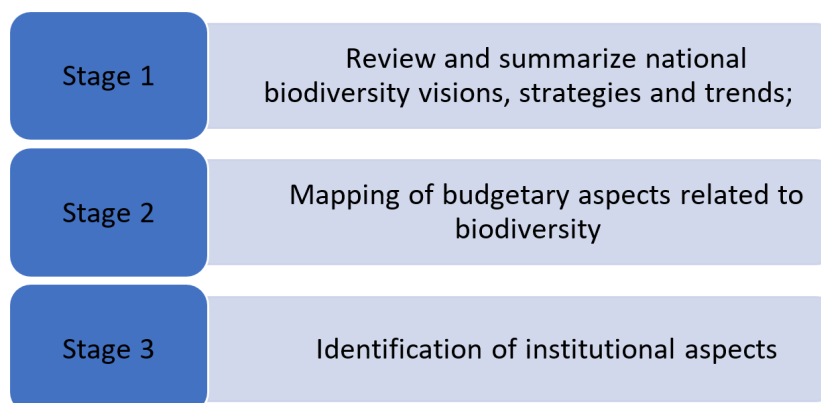

Stage 1	Review and summarize national biodiversity visions, strategies and trends;
Stage 2	Mapping of budgetary aspects related to biodiversity
Stage 3	Identification of institutional aspects

Figure 1| Execution stages of the Institutional Review and Policies for the Financing of Biodiversity (PIR) in the federal government of Brazil

Source: Prepared by the author based on (UNDP, 2016).

We reviewed national policy and strategy documents to identify these three sets of objective elements of a PIR and if biodiversity is a fundamental part of sustainable development. In the case of Brazil, which has a legally endorsed National Strategy and Action Plan for Biodiversity - NBSAP, this was used as the basis for the analyses, as recommended by the Biofin methodology (UNDP, 2018).

The NBSAP is the document that brings together proposals for Brazilian contributions to international conservation agreements. NBSAP expresses the commitment of the Brazilian government, as a signatory to the CBD, to develop and adopt political instruments at the national level for the conservation of biodiversity that are effective, participatory, and up-to-date (BRASIL, 2017a).

Thus, 21 laws, rules, and regulations responsible at the federal level for meeting the objectives and goals established by NBSAP were listed. It was possible to map the main normative instruments responsible for implementing the 20 goals established related to the five strategic objectives (Table 1).

The identification of these norms was carried out in a non-exhaustive way, listing, in particular, those related to the creation of policies that met the objectives of the NBSAP.

For each of the listed norms, were analysed all of their instruments and action guidelines. Finally, we classified the instruments and guidelines into four categories: use of markets, creation of markets, environmental regulation, and social participation (WORLD BANK, 1997).

Table 1| List of NBSAP's strategic objectives and goals with the main legal instruments responsible for its execution at the federal level

Objectives of the NBSAP	National Biodiversity Targets	Policies/Instruments
Strategic Objective A – Address the root causes of biodiversity loss by making biodiversity concerns permeate government and society	National Goal 1: By 2020, at the latest, the Brazilian population will be aware of the values of biodiversity and the measures they can take to conserve and use it sustainably.	National Environmental Education Policy. LAW No. 9795, OF APRIL 27, 1999. LAW No. 6,938, OF AUGUST 31, 1981. Provides for the National Environmental Policy (BRASIL, 1981).
	National Target 2: By 2020, at the latest, the values of biodiversity, geodiversity and sociodiversity will be integrated into national and local development strategies and poverty eradication and inequality reduction, being incorporated into national accounts, as appropriate, and into procedures planning and reporting systems.	DECREE No. 4339, OF AUGUST 22, 2002. Institutes principles and guidelines for implementing the National Biodiversity Policy. LAW No. 6,938, OF AUGUST 31, 1981. Provides for the National Environmental Policy (BRASIL, 1981).
	National Target 3: By 2020, at the latest, incentives that may affect biodiversity, including so-called perverse subsidies, will have been reduced or reformed to minimise negative impacts. Positive incentives for the conservation and sustainable use of biodiversity will have been designed and applied consistently and in accordance with the CBD, considering national and regional socioeconomic conditions.	DECREE No. 4339, OF AUGUST 22, 2002. Institutes principles and guidelines for implementing the National Biodiversity Policy. LAW No. 6,938, OF AUGUST 31, 1981. Provides for the National Environmental Policy, its purposes and mechanisms for formulating and applying it, and makes other provisions (BRASIL, 1981).
	National Target 4: By 2020, at the latest, governments, the private sector and interest groups at all levels will have adopted measures or implemented sustainable production and consumption plans to mitigate or avoid the negative impacts of using natural resources.	DECREE No. 7794, OF AUGUST 20, 2012. Institutes the National Policy on Agroecology and Organic Production.

Objectives of the NBSAP	National Biodiversity Targets	Policies/Instruments
	National Target 5: By 2020, the loss rate of native environments will be reduced by at least 50% (compared to 2009 rates) and, as far as possible, brought close to zero, and degradation and fragmentation will have been significantly reduced by all biomes.	LAW No. 12,651, OF MAY 25, 2012. Provides for the protection of native vegetation. LAW No. 6,938, OF AUGUST 31, 1981. Provides for the National Environmental Policy, its purposes and mechanisms for its formulation and application, and other measures.
	National Target 6: By 2020, the management and capture of any stocks of aquatic organisms will be sustainable, legal and done with the application of ecosystem approaches in order to avoid over-exploitation, put in place recovery plans and measures for depleted species, ensuring that fisheries do not have significant adverse impacts on endangered species and vulnerable ecosystems, and ensuring that fisheries impacts on stocks, species and ecosystems remain within safe ecological limits, where scientifically established.	LAW No. 11,959, OF JUNE 29, 2009. Provides for the National Policy for the Sustainable Development of Aquaculture and Fisheries. LAW No. 6,938, OF AUGUST 31, 1981. Provides for the National Environmental Policy.
Strategic Objective B – Reduce direct pressures on biodiversity and promote sustainable use	Incorporating sustainable management practices in agriculture, livestock, aquaculture, forestry, extractivism, forestry and fauna management will be disseminated and encouraged, ensuring biodiversity conservation.	DECREE No. 7794, OF AUGUST 20, 2012. Institutes the National Policy on Agroecology and Organic Production. DECREE No. 7,390/2010 ABC PLAN LAW No. 12,805, OF APRIL 29, 2013. Establishes the National Crop-Livestock-Forest Integration Policy. DECREE No. 8,375, OF DECEMBER 11, 2014. Defines the Agricultural Policy for Planted Forests (BRASIL, 2014). DECREE No. 3,420, OF APRIL 20, 2000. Provides for creating the National Forestry Program - PNF.
	National Target 8: By 2020, pollution, including those resulting from excess nutrients, will have been reduced to levels that are not harmful to the functioning of ecosystems and biodiversity.	LAW No. 11,445, OF JANUARY 5, 2007. Establishes national guidelines for basic sanitation. LAW No. 12,305/10. Establishes the National Solid Waste Policy (PNRS) (BRASIL, 2010).
	National Target 9: By 2020, the National Strategy on Invasive Alien Species should be fully implemented, with the participation and commitment of the states and with the formulation of a National Policy, guaranteeing the continued and updated diagnosis of the species and the effectiveness of the Action Plans for Prevention, Containment and Control	DECREE No. 4339, OF AUGUST 22, 2002. Establishes principles and guidelines for implementing the National Biodiversity Policy. ORDINANCE No. 3, OF AUGUST 16, 2018. Establishes the Implementation Plan of the National Strategy for Invasive Exotic Species.
	National Target 10: By 2015, the multiple anthropogenic pressures on coral reefs and other marine and coastal ecosystems impacted by climate change or ocean acidification will have been minimised so that their integrity and functioning are maintained.	LAW No. 7661, OF MAY 16, 1988. Establishes the National Coastal Management Plan (BRASIL, 1988).

Objectives of the NBSAP	National Biodiversity Targets	Policies/Instruments
Strategic Objective C: Improve the status of biodiversity by protecting ecosystems, species and genetic diversity.	National Target 11: By 2020, through systems of conservation units provided for in the SNUC Law and other categories of officially protected areas, such as APPs, legal reserves and indigenous lands with native vegetation, at least 30% of the Amazon, 17% of each of the other terrestrial biomes and 10% of marine and coastal areas, mainly areas of special importance for biodiversity and ecosystem services, ensuring and respecting the demarcation, regularisation and effective and equitable management, aiming to guarantee interconnection, ecological integration and representation in broader land and seascapes	LAW No. 9985, OF JULY 18, 2000. Establishes the National System of Nature Conservation Units and other measures. LAW No. 12,651, OF MAY 25, 2012. Provides for the protection of native vegetation.
	National Target 12: By 2020, the risk of extinction of endangered species will have been significantly reduced, tending to zero, and their conservation situation, especially those undergoing a greater decline, will have been improved.	DECREE No. 4339, OF AUGUST 22, 2002. Establishes principles and guidelines for implementing the National Biodiversity Policy.
	National Target 13: By 2020, the genetic diversity of microorganisms, cultivated plants, bred and domesticated animals and wild varieties, including species of socioeconomic and/or cultural value, will have been maintained, and strategies will have been designed and implemented to minimise the loss of genetic variability.	DECREE No. 4,339, OF AUGUST 22, 2002. National Biodiversity Policy. LAW No. 13,123, OF MAY 20, 2015. Provides for access to genetic heritage.
Strategic Objective D: Increase the benefits of biodiversity and ecosystem services for all	National Target 14: By 2020, ecosystems that provide essential services, including services related to water and that contribute to health, livelihoods and well-being, will have been restored and preserved, taking into account the needs of women, peoples and traditional communities, indigenous peoples and local communities, and the poor and vulnerable.	DECREE No. 8.972, OF JANUARY 23, 2017. National Policy for the Recovery of Native Vegetation (BRASIL, 2017). National Plan for the Recovery of Native Vegetation (Planaveg), Interministerial wOrdinance No. 230, of November 14, 2017.
	National Target 15: By 2020, the resilience of ecosystems and the contribution of biodiversity to carbon stocks will have been increased through conservation and recovery actions, including through the recovery of at least 15% of degraded ecosystems, prioritising biomes, watersheds and more devastated ecoregions, contributing to the mitigation and adaptation to climate change and to combating desertification.	MMA Ordinance No. 370, of December 2, 2015, established the National Strategy for REDD+ in Brazil (ENREDD+).
	Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Derived from Their Use will have entered into force and will be operational in accordance with national legislation	DECREE No. 4339, OF AUGUST 22, 2002. Establishes principles and guidelines for the implementation of the National Biodiversity Policy. LAW No. 13,123, OF MAY 20, 2015. Provides for access to genetic heritage.

Objectives of the NBSAP	National Biodiversity Targets	Policies/Instruments
Strategic Objective E: Increase implementation through participatory planning, knowledge management and capacity building.	National Target 17: By 2014, the national biodiversity strategy will be updated and adopted as a policy instrument with effective, participatory and up-to-date action plans, which should provide for periodic monitoring and evaluations. 1981 Provides for the National Environmental Policy, its purposes and mechanisms for formulating and applying it, and makes other provisions.	DECREE No. 4339, OF AUGUST 22, 2002. Establishes principles and guidelines for the implementation of the National Biodiversity Policy.
	National Target 18: By 2020, traditional knowledge, innovations and practices of indigenous peoples, family farmers and traditional communities relevant to the conservation and sustainable use of biodiversity and the customary use of biological resources will have been respected, according to their uses, customs and traditions, national legislation and relevant international commitments, and fully integrated and reflected in the implementation of the CBD with the full and effective participation of indigenous peoples, family farmers and traditional communities at all relevant levels.	LAW No. 13,123, OF MAY 20, 2015. Provides for access to genetic heritage, protection and access to associated traditional knowledge and benefit sharing.
	National Target 19: By 2020, the scientific bases and technologies necessary for knowledge about biodiversity, its values, functioning and trends and the consequences of its loss will have been expanded and shared, and sustainable use, generation of technology and innovation based on biodiversity will be supported, duly transferred and applied. By 2017, the complete compilation of existing records of fauna, flora and microbiota, aquatic and terrestrial, will be finalised and made available in permanent and freely accessible databases, safeguarding the specificities to identify gaps in knowledge in biomes and groups taxonomic.	DECREE No. 4,339, OF AUGUST 22, 2002. National Biodiversity Policy. LAW No. 6,938, OF AUGUST 31, 1981. Provides for the National Environmental Policy.
	National Target 20: Immediately upon approval of the Brazilian targets, assessments of the need for resources for their implementation will be carried out, followed by the mobilisation and allocation of financial resources to enable, from 2015 onwards, the implementation and monitoring of the Strategic Plan for Biodiversity 2011- 2020, as well as the fulfilment of its goals	DECREE No. 4,339, OF AUGUST 22, 2002. National Biodiversity Policy. LAW No. 6.938, OF AUGUST 31, 1981. Provides for the National Environmental Policy.

Source: Prepared by the author.

At the end of the first stage, we mapped the budgetary aspects of biodiversity. We carried out the second stage by analysing the Multiannual Plans - PPA.

In order to select federal public expenditures, we first carried out an analysis of Multiannual Plans - PPA. In the PPA, we selected programs related to environmental conservation. Subsequently, the budget worksheets were analysed through the SIOP to determine which programs foresaw in the

PPAs were in the budget. We carried out the mapping of programs and budgetary actions related to biodiversity in two rounds:

Round 1 – Selection in the database of the - Integrated Planning and Public Budget System - Siop[1] Of all programs and actions by the executive branch from 2000 to 2019. At this time, we filtered environmental programs;

Round 2 – From the filtered data, considering only programs related to the environment, new filtering was performed at the level of budgetary action. It was necessary due to broad programs that present actions related to the environment and others that are not.

Round 3 – Union of all selected actions to create a single database. We used the OpenRefine software to organise, clean, and help classify the generated database.

Finally, for stage 3 of identifying the institutional aspects of biodiversity conservation financing, the following were considered: a) The legal norms associated with NBSAP; b) The budgetary units and bodies related to the programs and actions identified in the PPAs and the budget. These three steps allowed for characterising the structures of the federal government responsible for implementing these policies (Figure 2).
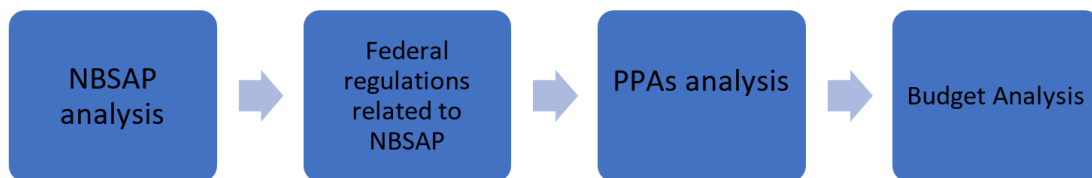

Figure 2| Diagram of the steps for analysing stage 3 of the PIR.

Source: Elaborated by the author

It is essential to highlight the challenge of working with a database related to public expenditures over more than 20 years. Large databases like this bring challenges to the development of this work. First, as the vast majority are textual data, the classification of these data according to the Biofin definition of spending on biodiversity is still subject to much subjectivity. Thus, it is essential to highlight that it is predictable that there are inaccuracies in the results presented. In addition, there may be divergences regarding understanding specific government programs and actions as being or not directed toward biodiversity conservation. Finally, it is essential to highlight that this research is limited to the scope of the federal government. However, states and municipalities also have roles in biodiversity conservation.

Even so, these data allow an assessment of the institutional aspects responsible for biodiversity conservation in the federal government of Brazil. They serve as a first approximation for understanding the government's conservation efforts and a possible indicator for the correlation with the results observed over that period.

3 RESULTS AND DISCUSSION

3.1 STAGE 1 – ANALYSIS OF THE NATIONAL STRATEGY AND ACTION PLAN FOR BIODIVERSITY – NBSAP

For this stage of the PIR, it was possible to identify at least 21 laws, decrees, and federal ordinances that would be the basis for the execution of actions to achieve the goals established in the NBSAP. These 21 norms present around 195 instruments and guidelines foreseen to execute the National Biodiversity Strategy and Action Plan - NBSAP. The analysis, according to the nature of the type of public policy instrument, showed that around 69% of the analysed instruments and guidelines fit the typologies of direct regulation and social participation. The other 31% could be broadly classified as economic instruments, with 23% classified under the market use typology and only 8% under the market creation typology.
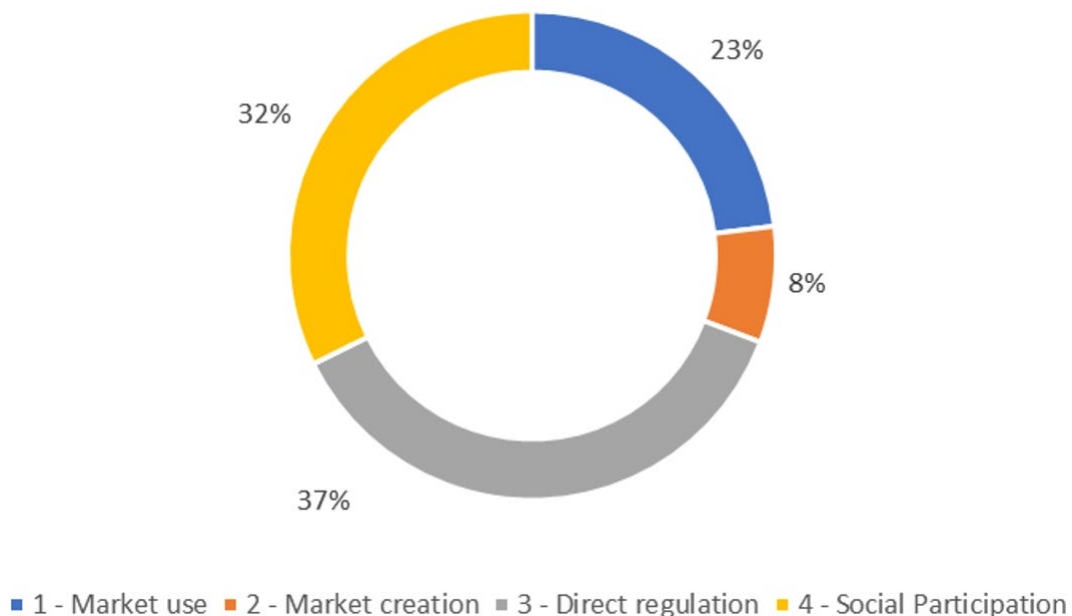

Figure 3| Distribution of classes of public policy instruments related to NBSAP.

Source: Prepared by the author.

As is known, the typical approach to environmental policy suggested by economic theory has been the adoption of means to internalise externalities in the decision-making process of degrading agents. However, we understand that other market failures may originate from environmental degradation. What is sought, in general, is the most efficient means of correcting degradation. The debate on the most appropriate instruments for this purpose often refers to the option between mechanisms of: a) direct regulation by government authorities; b) economic incentives to induce the action of the degrading agent (ALMEIDA, 1998).

This debate over policy instruments often classified only as "market-based" versus "command and control" is not very enriching. Markets involve prices and quantities, economic sanctions usually support regulations, and economic theory suggests that quantitative instruments such as standards, emission targets, or permits can be efficient in many cases (STERNER; CORIA, 2012). Furthermore, we observed more recently that, in implementing environmental policies, the instruments could

evolve from their original design, depending on the actors and specific contexts in which they are implemented, in a process called institutional crafting crafting (BLACKSTOCK *et al*., 2021).

Still, some insist that there are only three basic categories of policy instruments, aptly dubbed "carrots, whips, and sermons" to symbolise economic incentives, legal instruments, and informational instruments, respectively (BEMELMANS-VIDEC; RIST; VEDUNG, 2010). Isolated taxonomy is necessarily preferable, but each one can be useful in a different context (STERNER; CORIA, 2012).

Several arguments indicate the preference for economic instruments instead of direct regulation mechanisms. However, the environmental policy, in general, seems like it could be more permeable to these suggestions (ALMEIDA, 1998). This preference is also within the scope of the NBSAP and the federal policies that form the legal framework to support it since, as noted, the instruments of direct regulation are predominant.

Also noteworthy is the large percentage of instruments for public engagement or social participation, within includes many instruments for producing information. Information plays a unique role in policymaking, and indeed provision can be considered an instrument in its own right. Generally, all policy depends on information; that is, policymakers must understand the technology and ecology of the issues under consideration (STERNER; CORIA, 2012).

Despite being criticised, the concentration of direct regulation instruments is the apparent strategy for policymakers aiming to regulate the use of natural resources with a centralised intervention (VYRASTEKOVA; SOEST, 2007).

Considering these aspects, we analysed the general framework of instruments and guidelines related to the NBSAP, arriving at 30 suggested changes. We can divide these changes into four different groups: a) Specify the Economic Instruments already provided for in the standard; b) Transform the nature of the existing instrument so that it becomes an Economic Instrument; c) Link biodiversity conservation criteria to existing financial instruments; d) Creation of new non-existing instruments or guidelines (Table 2).

Table 2| Example of the instruments and guidelines of the norms related to the NBSAP with some suggestions for modification concerning the nature of the instrument.

Standard	Instruments	Category	New Category	Justification
National Biodiversity Policy	11.2. Second guideline: Conservation of ecosystems in protected areas. Promotion of in situ conservation actions for the biodiversity of ecosystems in conservation units, maintaining ecological and evolutionary processes, the sustainable supply of environmental services, and the integrity of ecosystems.	Direct Regulation	Market Creation	The objective here is clearly to maintain ecosystem services - public good; applying subsidies in the form of PES would make sense.
National Biodiversity Policy	13.3. Third guideline: Recovery of degraded ecosystems and overexploited components of biodiversity. Establishment of instruments that promote the recovery of degraded ecosystems and overexploited components of biodiversity	Direct Regulation	Market Creation	Once again dealing with public goods, progressive IPTU - style taxes could be established for landowners with degraded areas and incentives for the recovery of these areas to the detriment of the opening of new agricultural frontiers

Standard	Instruments	Category	New Category	Justification
Forest Code	II - the transformation of Legal Reserves into green areas in urban expansions	Direct Regulation	Market Usage	With a progressive impact on the reduction of the ITR - IPTU tax, given the greater need for green areas in urban environments
National Policy for Planted Forests	XIV - taxation and fiscal incentives;	Market Usage	Market Usage	Link to environmentally non-damaging conditions
National Policy for Planted Forests	XIX - land credit.	Market Usage	Market Usage	Link to environmentally non-damaging conditions
National Biodiversity Policy	16.4. Fourth guideline: Financing mechanisms. Integration, development, and strengthening of financing mechanisms for biodiversity management.	Market Usage	Market Usage	Specify, including defining what is considered an investment in biodiversity.
National Policy for the Recovery of Native Vegetation	7.2.2 Strategic Initiative: Markets – Fostering markets for ecosystem products and services generated during the recovery process	Market Creation	Market Creation	Specify standards such as estimates of forest carbon capture in areas under restoration in different biomes
National Solid Waste Policy	Create economic instruments that reach producers, trade, and end users, such as SDR and incentives to reduce plastics and use of biodegradable products and with a focus on public authorities by conditioning an increase or reduction in federal transfers to meeting performance indicators compliance with a policy such as closing landfills and taxes on the use of easy-to-dispose products.		Market Creation	Creating a new instrument
Implementation Plan of the National Strategy for Exotic Species	Collection of taxes for import, commercialisation, and creation of species with potential invasive impact		Market Usage	Creating a new instrument

Source: Prepared by the author.

Several factors are related to the predominance of a particular type of instrument. We can cite the nature of the final object of the law, as is the case of the National Environmental Education Policy - Pnea of 1999, which presents a predominance of social participation instruments, also including information instruments. On the other hand, the National Organic Production Policies - Pnapo, the National Agricultural Policy for Planted Forests, and the new Forest Code (National Policy for the Protection of Native Vegetation) present a more significant proportion of instruments for market use and market creation. This is expected given the object to be regulated by the laws, which are more related to productive activities.

It is also possible to note that policies that have a broader approach present a greater balance of different types of instruments, as is the case of the National Policy and Plan for Native Vegetation - Planaveg; National Policy on Climate Change - PNMC; National Strategy for Reducing Emissions from Deforestation and Forest Degradation - ENREDD and the National Environmental Policy itself. Concerning these norms, it is worth mentioning that they deal with more recent issues and that the academic and non-governmental sectors actively participated in their elaboration process.

Other aspects may be related to the historical period in which the policies were elaborated and the aspect of the division of competencies between the spheres of power. These characteristics are because specific policies expected to be complemented by states and municipalities may reserve a predominant regulatory role for the federal government.

Although the federal government plays a predominant regulatory role in some policies or defines general guidelines, some aspects drew attention, as noted in the suggestions for changes. The first aspect is the ambiguity and needs for explicit definition in some instruments, which may delay their realisation, waiting for regulations. The second aspect is the non-observance of criteria, such as reducing administrative costs, with the determination of regulatory instruments that could be substituted, transferring the costs to private agents.

On the other hand, some of the suggestions go in the direction of assuming subsidies as necessary, which could burden the State, and the creation of taxes that do not have good public acceptance. That is, we need a balance by combining a system of fines and monitoring activities that seek optimal levels of conservation, at least in theory.

However, in practice, centralised enforcement may not be very effective in developing countries (which are, after all, the richest in biodiversity). Moral hazard problems play an essential role in those government institutions responsible for conservation that do not always receive adequate incentives to actively prevent the over-exploitation of resources (VYRASTEKOVA; SOEST, 2007).

We must remember that we design policy instruments to achieve political objectives (MUKHERJEE; COBAN; BALI, 2021). That is, we also consider that the choice of types of instruments is related to the guidelines of governments and legislators prevailing in the analysed period.

We recognised that the definition of instruments plays an essential role in determining the overall success of a policy. However, the instrument selection process is not linear, as a logic of effectiveness and adequacy can drive it. The first is based on a relationship between means and objectives, and the latter is based on shared values and ideas of legitimacy (CAPANO; LIPPI, 2017).

However, reconciling these logics takes place in a complex and inherently political environment, in which the definition of instruments and the allocation of efforts for their execution reflect power relations and ideas about the social "value" of different groups (KRAUSE *et al*., 2019). Therefore, mapping budgetary expenditures complementary to mapping instruments can offer a better understanding of government actions.

3.2 STEP 2 – MAPPING BUDGETARY ASPECTS

The analysis of budgetary actions related to biodiversity between 2000 and 2019 also showed a predominance of command-and-control instruments (57%), while 24% of budgetary actions can be classified as social participation, 17% as market use, and 2% as market creation (Figure 4).

2000 to 2019

■ 1 - Market Use ■ 2 -Market Creation ■ 3 - Direct Regulation ■ 4 - Social Participation
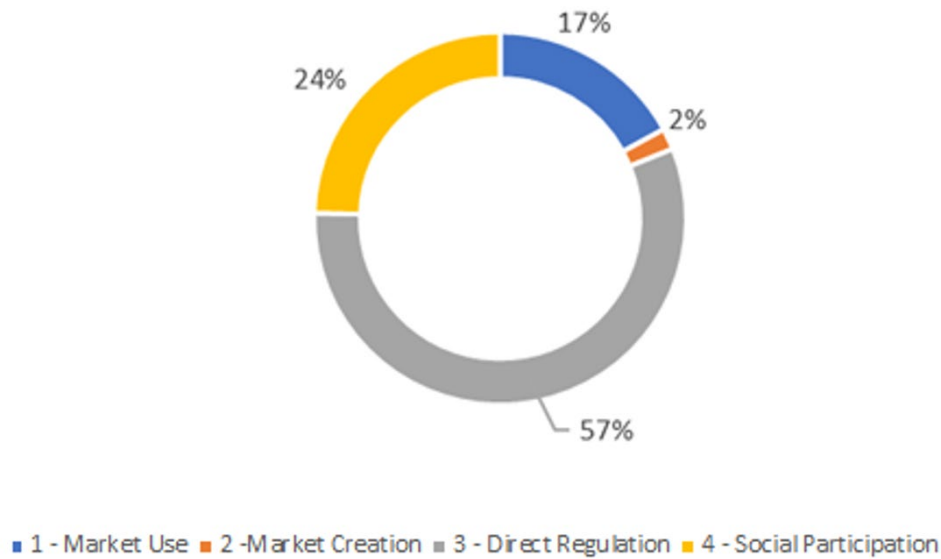
Figure 4| Classification of budgetary actions according to the nature of the instrument between 2000 and 2019.

Source: Prepared by the author based on data from Siop

We observed that in budgetary actions, regulatory instruments are predominant (57%). This predominance is even greater than in standards related to the NBSAP (37%). These results also underscore the apparent predilection for instruments of this nature in actions carried out by the government.

The disparity between the plan at the policy level and the execution by the government stands out. That is, even presenting broader legislation to regulate the use of natural capital, government actions partially differ from what norms established.

Another possibility is that some of these other strategies have been taken over by other federal entities (states and municipalities) or non-governmental and supranational institutions. The federal budget does not consider those actions.

These aspects show that setting up the government budget is a complex technical and political exercise, which depends on both macroeconomic indicators and political interest disputes. Moreover, as a consequence, the actions foreseen in the budget are expected to keep disparities in relation to the nature of the instruments foreseen in the institutional framework.

The analysis also showed an evolution in the increased participation of economic instruments (especially those for market use) in actions carried out by the federal government related to biodiversity. At the same time, there was a reduction in the percentage of social participation instruments (Table 3).

Table 3| Number of existing budgetary actions in the multi-year Plans – PPA's from 2000 to 2019 of the federal government related to spending on biodiversity according to the classification of the type of instrument in which they fit.

Number of budget actions related to biodiversity per PPA				
Classification	2000-2003	2004-2007	2008-2011	2012-2015	2016-2019
1 - Market Use	1057	927	677	1338	1323

Number of budget actions related to biodiversity per PPA					
Classification	*2000-2003*	*2004-2007*	*2008-2011*	*2012-2015*	*2016-2019*
2 - Market Creation	118	158	62	128	109
3 - Direct regulation	5286	5562	3052	2610	1141
4 - Social Participation	3051	2001	1380	665	551
Total	**9512**	**8648**	**5171**	**4741**	**3124**

Source: Prepared by the author based on Siop data.

It is possible to observe that the number of budgetary actions was significantly reduced, which may indicate a greater concentration of resources in fewer activities. However, it also reflects the reduced financial resources available for biodiversity conservation actions. What most calls attention is the considerable reduction in social participation actions, which may reflect the execution of more centralised actions by the government and the reduction of space for society to participate in the governance of biodiversity.

In addition, this reduction in actions aimed at conservation ran together a significant reduction in the participation of the Ministry of the Environment. As of 2019, the number of budget actions earmarked for biodiversity conservation in the MMA became smaller than those earmarked for the same purpose in other federal government agencies (Figure 5). This reduction may be directly related to the restructuring of MMA and its previously highlighted associated areas. This restructuring is worrying since the responsibility for implementing conservation policies went to departments whose primary purpose is to develop productive activities and not conservation. Without adequate environmental funding, legislative and programmatic goals are obstructed, and research shows that fiscal measures reflect states' commitment to environmental protection and the quality of their environmental programs (DUGGAN; CARR; YAN, 2022). That is, this reduction in budgetary actions means a reduction in funding for conservation. In particular, a reduction for those bodies with more direct responsibility for carrying out conservation policies.
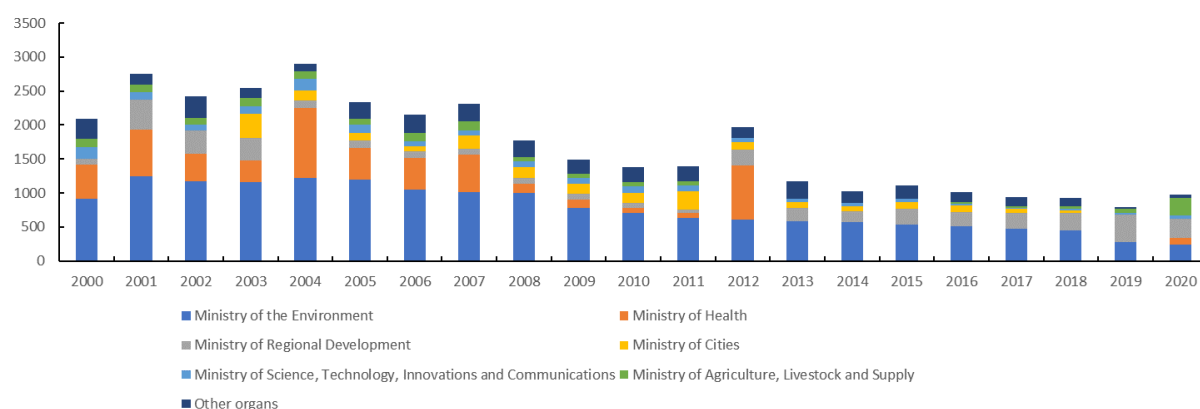

Figure 5| Number of executed/planned budgetary actions related to biodiversity management in the federal budget by the budgetary agency between 2000 and 2020

Source: Prepared by the author based on Siop data.

Political scientists have studied policy instruments better to understand the links between policymaking and policy implementation and gain insights into public policy decision-making. The evolution of these data over time and from different governments demonstrates that the political process of choosing

public policy instruments is a form of adaptation and search for answers to problems shaped by restrictions and political assumptions existing in its context. Thus, different governments prefer specific instruments based on their state-society relationships (HOWLETT, 1991).

We observed that the influence of the political context for selecting a public policy instrument occurs from the policy formulation process. In this phase, a set of instructions is transmitted from policymakers to implementers explaining the policy's intention, objectives, desired effects, and the means to achieve them (BEMELMANS-VIDEC; RIST; VEDUNG, 2010).

We also observed from the collected data that there is a disparity between the formulators of biodiversity policies and their executors, which can happen due to several factors:

1. In many cases, public policies and the instruments provided are designed as responses to society's demands, not rarely with the participation of various actors, often specialists in the sector. One example is Proveg, conceived due to strong pressure from organised civil society for a regulatory framework for ecological restoration in Brazil.

2. The policy proposal can be modified within the scope of Congress with the addition and removal of instruments that better represent the interests of parliamentarians (e.g.: Forestry Code[2]);

3. Or, even if the instruments are provided for by law, there may not be their regulation (e.g.: articles 45 and 46 of the Snuc[3]);

4. In addition, even if the instruments are foreseen and regulated, there may not be the technical capacity to operationalise the instruments, especially in relation to those that need trained personnel also in states and municipalities.

Another possible observation to be made about biodiversity conservation actions carried out by the government during these 20 years is that there was a reduction in direct regulation actions (command and control), on the one hand. Moreover, on the other hand, there was also a reduction in social engagement actions (social participation).

Concerning economic instruments, there was an increase over the years analysed. The increase was most evident for instruments that fall into the market use class. Do these elements raise questions about whether the actions carried out by the government in the analysed period do not lack a basis of information? Furthermore, if the economic instruments used because they are for market use (e.g.: subsidies and support for projects) not burdening the budget too much in a period of scarce resources?

Although the budget data surveyed need a qualitative complement in their analysis to represent reality better, environmental budgets reflect the effort that governments intend to dedicate to environmental protection, and the allocations are indicative of the viability and influence of these efforts. Examining appropriations of general funds can reveal the influence of budget determinants in the context and the general budget process (DUGGAN; CARR; YAN, 2022).

In addition to budgetary aspects, the formulation of state policies is usually explained by variations in the responsiveness of state policies and by the influence of actors, policy subsystems, and institutions involved in the budget process. Within the environmental policy literature, specific influences on state policymaking include environmental and economic conditions, interest groups that make demands on the government, and party preferences (KIM; VERWEIJ, 2016). Thus, in a complementary way, we evaluate the evolution of institutional aspects at the federal level.

3.3 STEP 3 – IDENTIFICATION OF INSTITUTIONAL STRUCTURES

The analysis of norms and budgetary actions related to implementing NBSAP's objectives and targets in Brazil demonstrated that the basic structure of biodiversity management is linked to the Ministry of the Environment – MMA, its affiliates, and associated councils (Figure 6).

Even so, it is essential to point out the linkage between environmental policies whose execution or coordination with the MMA foresee the participation of other federal bodies and entities. One example is the PNMA, which provides for the participation of bodies from specific sectors as executors of its actions. In other cases, such as the Pnea, joint action between the MMA and the Ministry of Education is necessary due to the very nature of the instruments. In other cases, like the National Coastal Management Policy, its highest body is the Interministerial Committee for Sea Resources, chaired by the Brazilian Navy.
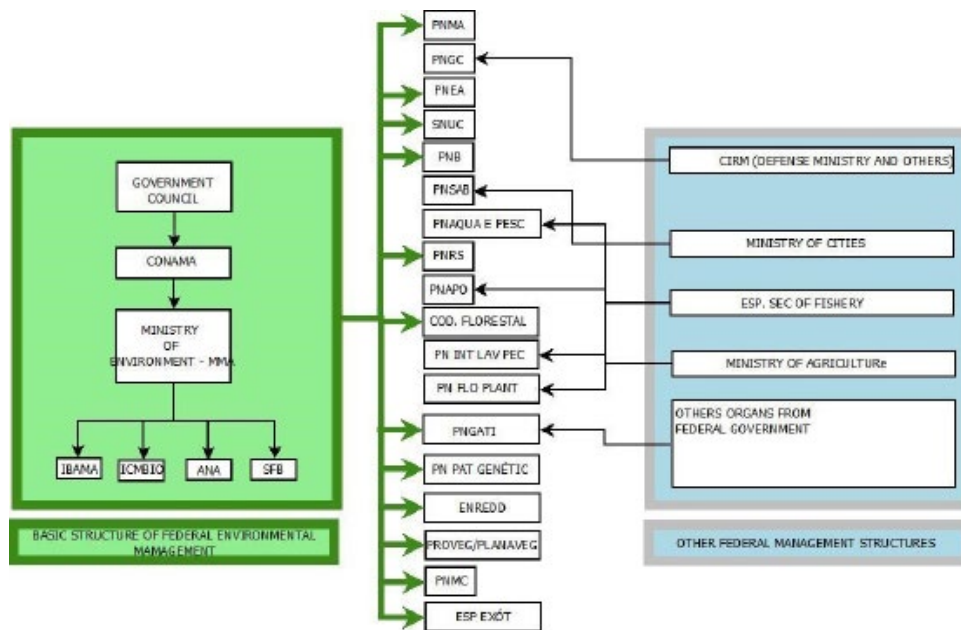

Figure 6| Institutional structures responsible for executing or coordinating federal policies related to the NBSAP.

Source: Prepared by the author.

Observing this arrangement shows potential trade-offs in the execution of some of the policies related to the NBSAP. An example is the National Basic Sanitation Policy, linked (during most of the analysed period) to the Ministry of Cities, whose actions often promote changes in the natural environment due to the many civil construction works related to its execution. Another of these potential trade-offs is the responsibility for Planted Forest Policies, Integration of Lavoura Pasto Floresta, and Organic Production, which are under the umbrella of the Ministry of Agriculture - Mapa.

In the first case, we drew attention to the need for a well-aligned forestry code under the supervision of the Ministry of the Environment. In the other two cases, there is a potential conflict with the profile[4] The Ministry is directed more towards conventional agriculture. At the same time, the two policies propose to develop alternative forms of production and, consequently, may need to be addressed in relation to the attention and allocation of resources by the executing agency.

In addition to these examples, several other policies affect or are affected by environmental policies at the federal level in Brazil. However, concerning biodiversity conservation policies, these are more concentrated in the MMA and its affiliates.

It is also important to point out that other structures are part of elaborating norms related to biodiversity conservation, such as the National Council for the Environment – Conama. However, we carried out an analysis restricted to those government structures responsible for implementing the policies, analysed through the actions in the budget.

We need to highlight that the structuring of these bodies took place over time. We portrayed the predominant structure between 2008 and 2018 here. During this period, we can highlight some significant changes, such as the creation of the Chico Mendes Institute for Biodiversity Conservation – ICMBio (Protected Areas Agency), by law nº 11.516, de 28 de August de 2007, to execute actions of the national policy of nature conservation units, among others (BRASIL, 2007), and the Brazilian Forestry Service – SFB, focusing on the management of public forests, created by law nº 11.284, of March 2, 2006 (BRASIL, 2006).

This organisational structure changed over the analysed period. We highlighted here the most recent changes: the departure of the Brazilian Forest Service - SFB and the National Water Agency - ANA from the structure of the Ministry of the Environment through decree 9672/19 (BRASIL, 2019a). In addition, the main biodiversity management body, ICMBio, underwent restructuring, in which six of the 11 regional coordination offices were extinguished, and the heads of Conservation Units were reduced from 204 to 182 through Decree No. 10,234/2020 (BRASIL, 2020a).

The National Biodiversity Commission was also restructuring, excluding indigenous members and social movements from its composition through Decree No. 10,235, of February 11, 2020 (BRASIL, 2020b). These changes reinforce the trend of reduced social participation, a situation also observed in the modification of the National Council for the Environment - Conama, through Decree No. 9,806 of May 28, 2019 (BRASIL, 2019b). This type of restructuring goes against good governance practices since the involvement of citizens and Civil Society Organizations in the elaboration of environmental policies is widely recognised as an essential way to improve the effectiveness and quality of these policies and is a principle of good governance (MAO *et al*., 2020; VINOGRADOVA, 2022).

These highlighted institutional change events demonstrate that, after a period of relative stability, the institutions responsible for biodiversity conservation at the federal level have undergone significant changes. However, these changes do not indicate increased performance or effectiveness. On the contrary, the changes point to a purposeful disarticulation in managing biodiversity conservation at the federal level in Brazil.

All these institutional modifications reinforce the importance of understanding the situation and changes in the institutional landscape related to biodiversity conservation in Brazil. This portrait of the institutional landscape of the last 20 years allows us to demonstrate that recent changes indicate a commitment to actions for the conservation of biodiversity.

Finally, it is important to highlight that, to understand the institutional framework designed for implementing environmental policies in general and, specifically, biodiversity policies in Brazil, it is crucial to understand the country's federative structure, broken down into its three levels of government.

In this organisation, the Federation Units and municipal governments have the autonomy to establish policies according to their priorities, within their areas of competence, and within the limits set by their territories (IPEA, 2016). This organisation was established by Complementary Law 140 (LC-140), which established the norms for cooperation between the Union, the States, the Federal District, and the Municipalities in administrative actions resulting from the exercise of joint competence related to the protection of remarkable natural landscapes. , the protection of the environment, the fight against pollution in any form, and the preservation of forests, fauna, and flora (ANTUNES, 2015).

Understanding this decentralisation aspect is important, as political, fiscal, and administrative decentralisation differs in their impacts on environmental policy performance. High environmental policy performance occurs more often when a country is fiscally and administratively decentralised, and its context is favourable, i.e., advanced economy, good governance, and strict environmental regulations (MAO, 2018).

It is essential to highlight this, as the institutional organisation at the federal level took place at times from the extinction and merger of some bodies (as in the creation of Ibama – Brazilian Federal Environmental Agency), at times from the dismemberment of others (as in the case of ICMBio - Federal environmental agency responsible for Protected Areas, which emerged from a division of Ibama). New bodies were also created to fill gaps yet to be met by existing institutions, such as the National Water Agency - ANA, created to implement the instruments of the National Water Resources Policy and act in the National Sanitation Policy. These structuring movements, sometimes conflicting, always demanded a new accommodation for the newly created functions and the development work (hiring and training of personnel, physical structure, equipment logistics, among others) that continues until today (IPEA, 2016).

In this way, we can understand that the most recent dismantling of the budgetary and institutional structures responsible for biodiversity conservation was not balanced with an increase in the responsibilities of the other federative entities in Brazil. Moreover, the institutional landscape shown here demonstrates a recent loss of capacity to promote biodiversity conservation at the federal level in Brazil.

4 CONCLUSIONS

Considering, on the one hand, the growing crisis of biodiversity loss on the planet and, on the other hand, the increasing need to seek efficiency in government actions, this work stands out for the scope of data collected on government action related explicitly to biodiversity in federal level in Brazil.

The main result of this study demonstrates the mismatch between the objectives and instruments for the conservation of biodiversity foreseen in the laws and the government actions carried out in the federal budget. These results demonstrate that the actions carried out by the federal government over these 20 years are partially disconnected from the guidelines provided for facing the loss of biodiversity.

The results demonstrate how complex the biodiversity management structure is in Brazil. Even considering only the federal government level, the study demonstrates how, over the 20 years analysed, significant changes in management arrangements can hinder the lasting implementation of conservation actions.

These changes have been especially noticeable in recent years. Changes in budgetary, regulatory, and institutional aspects were deliberately adopted. The changes were contrary to what is known in the literature and empirical knowledge that promote the effectiveness of biodiversity conservation instruments.

Other results of this study seem to demonstrate a lack of theoretical foundation in elaborating guidelines and instruments for the conservation of biodiversity, both in the norms and in the budgetary actions analysed.

In the analysed data, it was still possible to observe a progressive reduction of budgetary actions, which may indicate a reduction in the allocation of resources for conservation in the last 20 years.

The reduction of the Ministry of the Environment's participation in biodiversity conservation actions stands out.

These elements point to a scenario of reduced prioritisation of biodiversity conservation at the federal level in Brazil. However, it is important to emphasise the subjective character of the analyses carried out in this work since it deals with the qualitative analysis of textual documents and a large volume of data, for which there is not necessarily a guideline for analysis.

Therefore, it is necessary to deepen the theme in future research concerning the analysis of the legal framework and the administrative structures and budgetary actions. In addition, it is necessary to cross-check the data and analyses carried out in this work with data from the impact assessment of related public policies.

Despite the shortcomings of this work, the results show a first contribution to the necessary detailing of government actions, especially in the environmental area. This contribution is particularly significant for developing the policy and institutional review (PIR) approach envisaged in the Biofin initiative.

This is important because, although well-established guidelines exist, the PIR must present methodological details to follow. Thus, this work contributes with a first proposal detailing the execution of a review of this nature. In this way, a milestone is established for future research, mainly at the state and municipal levels. The development of future research with the elaboration of PIRs at different federal levels can contribute to a better definition of divisions of responsibility and greater effectiveness of conservation policies.

Data collection on how governments act in the face of the biodiversity loss crisis is essential for social control in favour of effective changes for better management of natural capital.

NOTES

1| The Siop can be accessed at: https://www1.siop.planejamento.gov.br/QvAJAXZfc/opendoc.htm?document=IAS%2F Execucao_Orcamentaria.qvw&host=QVS%40pqlk04&anonymous=true

2| Law No. 12,651, of May 25, 2012, which provides for the protection of native vegetation, known generically as the New Forest Code, replaced the previous law of 1965, and was the target of a major clash in the national Congress, being approved with a large number of vetoes, and with important criticism from civil society and the academic sector, in relation to points considered as environmental setbacks, and approved in Congress by the interest of parliamentarians

3| Articles 45 and 46 of the Law creating the National System of Conservation Units deal with the possibility of payment for environmental services in federally protected areas. However, to date, they have yet to be regulated, generating legal uncertainty and difficulties in implementing such mechanisms.

4| of the Mapa. During most of the period analyzed in this work, Mapa was responsible for conventional agriculture, while the Ministry of Agrarian Development was responsible for developing family agriculture.

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