Brazilian public policies analysis to support the participatory construction of the National Plan for Soil and Water Sustainable Management

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Abstract

This article seeks to analyze relevant federal public policies in Brazil related to soil and water conservation in order to extract the key lessons learned upon its implementation to support the participatory formulation of the National Plan for Soil and Water Sustainable Management. The policy analysis was made based on six strategic axis: Legislation, Prevention, Conservation, Recovery, Monitoring and Integration. These analyzes results aim to contribute to subsidize the Plan construction and identify instruments to increase the use of soil and water resources efficiency in agricultural production according to the different environmental, social and economic conditions of the country's regions. Seven public policies were selected, characterized and analyzed. The results showed that none of the analyzed public policies are taking enough actions to accomplish with the six strategic axis for soil and water sustainability. These gaps were detected and described as opportunities to be considered under the new national policy framework. The needs for greater involvement of civil society and other relevant stakeholders on policy design and decision making as well as integration among federal ministries were also identified. In conclusion, it is suggested that the new Plan should be designed under a decentralized and participatory process to effectively gather engagement and stronger commitment from governments and other strategic stakeholders in public decisions towards soil and water sustainable management in the agriculture, thus contributing to sustainable rural development.

Keywords

land degradation, soil erosion prevention, sustainable development goals, participatory policy, water conservation, society empowerment

2. INTRODUCTION

The growth of the world population and consequently the demand for food, fiber and energy has led to the degradation of soil and water resources leading to food insecurity, malnutrition and several socio-economic issues. Approximately 33% of the world's soils show some type of degradation (FAO, 2017). The inequality and unsustainable path of growth raised important concerns about the future of our planet and society thus evolving the approach of sustainable development. Since then, several countries has strongly committed efforts to reduce poverty and hunger as well as conserve and preserve natural resources while increasing economic growth (United Nations, 2015). In Brazil, the past agriculture cycles based on unsustainable land management practices, such as deforestation, slash and burn, intensive and inappropriate use of mechanization, pesticides and fertilizers increased erosion processes upon a diversity of fragile across biomes and regions (Miranda, et al., 2015). Disperse public policies were undertaken aiming to effectively reverse or prevent the progress of degradation and improve degraded lands recovery (TCU, 2015). To meet the growing demand for food it is imperative to take efforts towards the reinsertion of degraded lands into agricultural production

systems. This also represents a great opportunity to increase national food production on a sustainable basis.

Brazil plays an important hole on global environmental guidelines and commitments, showing leadership in key international strategies and agreements towards sustainable development goals. Since 1980´s the environmental sector in Brazil has been strengthened and structured with policies and plans to support natural resources conservation, preservation and restoration. However, these efforts were made regardless agriculture environmental issues and from challenges and constrains faced by both agribusiness and family farms sectors (Leonard et al., 2011).

To contain the advance of soil erosion in agricultural exploitation, past policies such as the National Soil Conservation Plan in 1975 through the Decree nº 76470 (Brasil, 1975) and the National Watershed Program in 1987 for through the Decree nº 94.076 (Brasil, 1987) were created. Both policies were undertaken in a short period of implementation thus not producing expressive results. Currently, only few states of the federation are still running the National Watershed Program without any federal support or coordination. More recently, the Brazil´s National Soil Survey and Interpretation Program (PronaSolos) were approved in 2018 through the Decree nº 9.414 to improve the design of future polices addressing soil and water sustainable management issues (Brasil, 2018). In face of the importance of the agriculture sector to Brazil´s economy it was highly recommended by the country´s accounting bodies the design of a national policy to effectively enhance the adoption of soil and water sustainable management practices in agriculture systems.

The objective of this research is to support the construction of the National Plan for Soil and Water Sustainable Management (PNMSA), contrasting other relevant public policies with six main thematic axis to address soil and water sustainability: Legislation, Prevention, Conservation, Recovery, Monitoring and Integration with relevant stakeholders. Firstly, the actors involved in each of these policies are analyzed, and secondly the degree of correspondence and attention of each of these policies to each of the axis proposed for the PNMSA is analyzed. We hope that this work provides relevant information for the future participatory process of PNMSA construction, offering systematic inputs for its discussion.

3. MATERIALS AND METHODS

Through the bibliographic survey and pertinent information, federal policies related to the use, management and conservation of soil and water in Brazil were identified. Subsequently, the main characteristics of each of these policies were synthesized, as well as an interpretative analysis, taking into account the adherence to each of the six strategic axis that are part of the ongoing Project for Participatory Construction of the Sustainable Soil and Water Management Plan in Brazil.

The proposed steps for the formulation of the PNMSA are: the definition of its principles, goals, objectives, strategies, activities, main results and impacts, the design of its institutional framework and integration with other multisectoral public policies (Figure 1).

Figure 1 - National Plan for the Sustainable Management of Soil and Water Framework.

The focus of this research is to contribute with inputs for the design of the institutional framework and the integration with other policies. To this end, it was undertaken a documentary research to provide a general understanding of the objectives and tools of public policies in Brazil in light of the following criteria: 1) inclusion in its normative body and scope the awareness of sustainable use and conservation of soil and water in rural areas; 2) time of operation, with at least one year under implementation and 3) coordination at federal level.

For each selected policy it was analyzed the institutional framework, objective and interface within the axis of Legislation, Prevention, Conservation, Recovery, Monitoring and Integration proposed to the PNMSA (Figure 2). The analysis seek complementarities and convergence of actions in support to the construction of the PNMSA, searching for lessons learned and opportunities from the implementation of these policies. These axis were proposed in the construction of the aforementioned project after analyzing a series of documents

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(TCU, 2019; Polidoro, 2016; TCU, 2015), which converge on the need to optimize the efforts of existing policies.

Figure 2 - The six proposed axis for the formulation of PMSA.

Based on the sis axis it was built an analytical framework to guide policy analysis process showed in Table 1.

Table 1 – Guidelines from the analytical axis for the selected polices.

This theoretical framework established the basis for a scored evaluation for the selected public policies. The analysis was made based on a classification method using a 0 to 2 scale to score the heuristic judgment of each policy considering the six axis. Score zero meant that the policy has no interface with the axis guideline; score 1 meant that the policy partially contemplate the axis; and score 2 meant that it fully contemplate the axis. Upon this classification it was calculated an average score per axis for all analyzed policies and an average score per policy for all axis. It is worth clarifying that it was also researched the normative body objectives of each policy, as well as its main instruments, with emphasis on those which Embrapa plays a predominant role.

The documentary analysis of reports, studies, evaluations and audits related to the implementation of the selected policies was carried out, allowing data triangulation on the scope of these policies. The analyzed documents were official assessments elaborated by Brazilian governmental institutions in charge of public policies control, monitoring and evaluation, such as Union General Controllership (CGU) and Federal Audit Court (TCU). Both institutions are responsible for defending public assets, transparency and fighting corruption, budgetary and financial accounting, and operational supervision of asset transactions through public administration.

The institutional framework analysis aimed to identify how many which type of policy partner institutions were involved in policy implementation, management, monitoring and evaluation. To this end, it was considered five dimensions: 1) governmental at federal level; 2) governmental at state and municipal levels; 3) teaching institutes and universities; 4) private sector; 5) civil society and non-governmental organizations (NGOs). Also important, the typology of governance bodies: decentralized, participatory, councils, committees, commissions, forums, networks, articulations, associations and cooperatives.

4. RESULTS

4.1Public policies selected for the analysis

The most relevant policies selected within the established criteria were seven:

1) National Environment Policy (PNMA): Establishes environmental protection measures and standards to guarantee the environmental quality of water and soil resources and the conservation of biodiversity, guaranteeing sustainable development and improving the living conditions of the population (Brasil, 1981).

2) National Water Resources Policy (PNRH): Proposes the systematic sustainable management of water resources, in quantity and quality, in account to the diversity of physical, biotic, demographic, economic, social and cultural aspects in Brazilian regions; seeks the integration and articulation of water resources management with environmental management and land use patterns; promote the articulation of watershed planning among water users sectors within regional, state and national levels; facilitates the river basin management integration with estuarine systems and coastal areas (Brasil, 1997).

3) Native Vegetation Protection Law (Forest Code): Establishes general rules on vegetation protection, permanent protection areas and legal reserves creation; defines limits for forest exploration, selection of forest raw materials, control of forest products origin; controls and prevents forest fires , in addition to providing economic-financial instruments to achieve its objectives (Brasil, 2012a).

4) National Policy on Agroecology and Organic Production (PNAPO) : Develops, adapts and stimulate adoption of soil management practices and processes with agroecological biases. Integrates, articulates

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and adapts policies, programs and actions that induce agroecological transition and organic and agroecological production, contributing to the sustainable use of natural resources and the supply and consumption of healthier food (Brasil, 2012b);

5) National Policy on Climate Change (PNMC): Officials the commitments assumed by the country in international agreements on climate change; promotes actions to mitigate climate change and reduce vulnerability of environmental, social and economic systems; seeks integrated strategies that encourage and support the participation of different actors in the agricultural, energy and steel sectors to mitigate and adapt to climate change (Brasil, 2009).

6) National Policy for the Recovery of Native Vegetation (Proveg): Proposes policies articulation, integration and promotion, defines programs and actions that induce the recovery of forests and other forms of native vegetation, in addition to the environmental compliancy of Brazilian rural properties, in a total area of, at least 12 million hectares, by 2030 (Brasil, 2017);

7) National Policy to Combat Desertification and Mitigate Drought Effects (PNCDMES): Establishes mechanisms to prevent and combat desertification, to recover areas under land degradation process, and to prevent, adapt and mitigate the effects of drought throughout the national territory; institutes mechanisms for protection, preservation, conservation and recovery of natural resources promoting environmental, water and energy security; integrates the production and use of water resources socially and environmentally, the production and use of water collection, storage and water conduction infrastructure (Brasil, 2015).

The main objectives and instruments of all the aforementioned policies were systematized and presented in Annex 1.

4.2 Institutional Framework

According to Rogers and Hall (2003), the following principles are linked to the notion of good governance: participation, transparency, equity, responsibility, ethics and sustainability. These principles were taken in consideration when analyzing the institutional framework of each selected policy. Figure 3 shows how many and which type of partner institutions are involved in the institutional framework of policy governance.

Figure 3 – Institutional framework of selected policies.

Federal government participation is common to all policies, since only federal policies were analyzed, but it was often noticed the participation of state government institutions and NGOs. The policies that cover the largest number of institutions were PNAPO and PNRH, with more than 100 institutions involved and a wide range of NGOs, private sector, universities, municipal and state government organizations. These policies also stand out for adopting participatory governance approaches, increasing social participation and enhancing the capillarity of policy actions. The civil society participation is foreseen in all policies, with the exception of the Forest Code. In the latter, an open monitoring platform was created by environmental NGOs available to society. In general, universities participation is limited, which weakens the interaction of policies with teaching, research and extension institutions in achieving concrete results in rural areas. The private sector has a smaller participation in all policies, standing out only in PNRH and PNMA.

The Table 2 presents the scoring results for the selected policies. In average, the results suggest that the future PNMSA shall pay more attention and strengthen concerns on the Recovery and Prevention axis. All policies analyzed obtained very low scores on the Recovery axis. This gap on public actions turns out to be an opportunity to be overcome by the PMSA. Therefore, it calls specific attention to policy designers when formulating policy options and tools.

Concerning Prevention axis, the scores shows clearly a segregation of two groups of policies. One with those policies that fully address prevention, such as the PNMA and the Forest Code, and other with two policies with less influence producing a lower score (PNMC and Proveg). This alerts that PNMSA shall focus on avoiding failures falling short these last policies. Monitoring axis also calls attention once five out of seven policies reached the maximum score.

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Table 2 : Scoring of selected policies with average guidelines for each axis.

The analysis also showed that the seven policies are well aligned with content and non-normative issues concerning the six axis, since all of them are scored above 1,50 in average. When looking through the lens of the axis only two (Recovery and Prevention) are below 1,71. However, as a future line of research, we will continue to carry out an assessment on the achievement of policy objectives; based on the implementation rules of each policy and the recommendations found on CGU and TCU audit reports and monitoring reports from civil society or mixed platforms.

5. DISCUSSION

5.1 – Legislation

Figure 4 – Average score of the policies selected for the Legislation axis. It is foreseen for the implementation of the PNMSA actions the design of a legal framework within the state, municipal and micro watershed levels. Therefore, it is important to survey laws and rules already in place in order to avoid overlapping. Both PNMA and PNCDMES received high scores on Legislation axis (Figure 4) since these policies establish legal tools to provide environmental and socioeconomic adequacy at the regional level. The PNMA includes mechanisms such as Ecological Economic Zoning (ZEE) (Brasil, 2002) and the assessment of environmental impacts of potentially polluting activities. In the PNCDMS, in addition to the ZEE mechanism, there is a set of state-level survey of plans, programs and projects aimed at the recovery of degraded lands. Also important, the elaboration of State Action Plans to Combat Desertification and Mitigate the Effects of Drought undergoes legal enforcement (Annex 1). It is worth mentioning that the PNRH also received a high score within this axis (Figure 4). The PNRH is a decentralized policy with high territorial capillarity, which adopts regulation tools undertaken by participatory consulting bodies at lower levels, the watershed committees (IPEA, 2012). This governance model although increasing government authority on policy drivers at higher levels, reduces government authority on decision making for concrete actions at the local level (Ollaik and Medeiros, 2011). In the PNMSA, in addition to the integration of existing public policy mechanisms with a focus on surveying regional environmental and socioeconomic characteristics for soil and water conservation purposes, it seems to be essential to the PNMSA to include inspection system to ensure the sustainable use, management and conservation of soil and water in different regions of the country. The future policy must seek for mechanisms to integrate technical assistance and rural extension services, in order to correct inadequacies detected at the local level. In addition, it is showed on Table 1 the ideal proposition of a fund to receive financial contributions in order to invest in priority areas for soil and water conservation actions (Table 1). ´**5.2 - Prevention Figure 5 -** Average score for policies selected for the Prevention axis. An important line of actions for the future PNMSA is related to the prevention of soil and water degradation. Preventive mechanisms were found in the PNMA and Forest Code policies, which revealed the highest scores in this topic (Figure 5). Through the implementation of ZEE, the PNMA advances on territorial management improvements. This policy articulated, the production of relevant information for decision making, expanded, institutional bases for zoning projects and promoted open dialogues with sectoral policies. Concerns with environmental conservation units and indigenous lands should also be taken into account in the process of prioritization of prevention zones, as well as strengthening and expanding the connections between the role of ZEE in territorial and environmental management instruments at different levels (TCU, 2008). The Forest Code includes the Rural Environmental Registry (CAR) as a mechanism allowing voluntary public electronic registration of land use and forest coverage of rural properties. This governmental system is applied to control, monitoring, environmental and economic planning and for fighting deforestation (IPEA, 2016). This mechanism also allows the availability of strategic information about environmental vulnerability and adequate preventive measures for decision making. However, the task remains challenging when bridging projects´ execution to real life situations focused on the implementation of the agreed guidelines. To overcome this gap the new PNMSA must foreseen mechanisms to reduce the time between zoning products generation and its integration into policy cycles, governmental planning and decision-making processes. The stock of soil and water preventive measures shall be ready when the technical stream of Kingdom´s multiple stream models is moving to open the window of opportunity and influence the agenda setting of territorial policies

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(Capella, 2018).

5.3 – Conservation

Figure 6 - Average score for the policies selected for the Conservation axis.

The Conservation axis ran through all the analyzed policies, revealing high scores for most of them (Figure 6). Actually, PNCDECS, PNAPO and Forestry Code policies has already foreseen mechanisms and strategies that encourage conservationist farmers. These policies received higher scores because they stimulate the development and implementation of conservation practices in order to improve the quality of soil and water resources in productive areas. Most important, these policies expand compensation instruments such as payment for environmental services (Figure 6).

The Forest Code stands out, which has a clear relation with its objectives and instruments seeking for the protection of riparian forests and springs which protect water sources and promote the regeneration of soil organic matter. This driver makes it possible to associate instruments of incentive or compensation for the provision of environmental services, such as maintenance and enhancement of carbon stocks, landscape scenic beauty preservation and biodiversity conservation, climate regulation, and soil fertility restoration (AHRENS& AHRENS, 2015). However, for the effective regulation of this standard, complementary instruments are needed to evaluate and value ecosystem services.

PNAPO foreseen for the National Plan for Agroecology and Organic Production (PLANAPO) the inclusion of a system to indicate the state of soil and water conservation as well as incentive mechanisms to support agroecological transition, to, such as certification and differentiated market price.

The PNCDECS is aligned with the guidelines of the United Nations Convention to Combat Desertification and Mitigate Drought Effects (UNCCD) and includes State Action Plans to Combat Desertification and Mitigate Drought Effects, as well as plans for Drought Prevention and Control (Annex 1).

Therefore, the future PNMSA policy should complement and improve the existing compensation mechanisms in order to foster the development and implementation of low-cost practices to enhance the quality of soil and water resources in agricultural systems.

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5.4 – Recovery

Figure 7: Average score of the policies selected for the Recovery axis.

In the Recovery axis, the policies analyzed presented lower scores, with the exception of PNMC and PNMA (Figure 7). The PNMC has a mechanism associated with the rural credit policy that provides financial resources for climate change mitigation actions (ABC Program). On the other hand, the PNMA channels environmental compensation funds from economic enterprises that can be integrated into water and soil recovery programs. In a similar way to the PNMC, but more focused on family farming, PNAPO uses credit lines from the National Program for Strengthening Family Agriculture (PRONAF), such as PRONAF agroecology, PRONAF forest, and PRONAF sustainable to integrate subsidized funds into farmers´ conservation efforts. Recovery actions are also related to the Prevention and Conservation axis, however, more focused on mechanisms and protocols for diagnosing the current situation of natural resources, in order to establishing scenarios for taking conservation and preventive actions. It can also foreseen collaborative database collection of local georeferenced observation.

As an example of this mechanism, the Rural Environmental Registry (CAR), under the Forest Code created a collaborative database about the boundaries of forested areas and areas to be conserved in rural properties voluntarily feed by technicians, producers and other citizens (Annex 1). It is an innovative and simplified instrument, pointed out by experts as capable of allowing government to manage forest resources, by providing not only the intersection between deforestation information and the areas to be restored and conserved,

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but the reconciliation between economic activities and environmental conservation, in an especially agile and fast way (Pires, 2013).

5.5 – Monitoring

Figure 8 - Average score of the policies selected for the Monitoring axis.

The Monitoring axis includes the design of mechanisms for the establishment of a system for the provision of key management information to improve decision making while delivering socio-economic and environmental benefits to Brazilian society. Each of the seven analyzed policies have in place and operational their own monitoring systems, although both PNMA and PNRH did not revealed the highest scores (Figure 8).

The policies with highest scores revealed monitoring systems with participatory and decentralized approaches, empowering and engaging society on collaborative preventive action. For instance, several of these policies have established policy observatories involving a coalition of non governmental institutions representing the civil society with interest and influence on policy decisions.

The Forest Code Observatory, is a network formed by 30 institutions, which monitors the implementation of the new Forest Law in order to generating data and critical mass to collaboratively support the enhancement of positive results and mitigation of negative aspects, avoiding further policy setbacks (*http://observatorioflorestal.org.br/*). In a different kind of coalition, the Observatory of the ABC Plan implementation, encloses an initiative among research institutions, farmers and agribusiness sector´s associations aimed at engaging society in the debate about low-carbon agriculture issues through monitoring impacts and outcomes of both ABC Plan and ABC Program (Brasil, 2012). This network built a platform to exchange data and information in order to develop technical studies to support and facilitate dialogue with stakeholders and civil society, thus stimulating transparency and awareness raising (*http://observatorioabc.com.br/*).

The PNAPO policy also embraces a huge coalition of diverse social, research, NGO and governmental stakeholders reporting policy results and impacts and advertising policymakers about policy areas of overlapping and gaps (IPEA, 2017). Undoubtedly, the lessons learnt upon the analyzed policies suggest that the future plan of soil and water conservation shall hold a robust and collaborative monitoring and information system to provide strategic data analyses in a transparent and interactive basis. It also shall facilitate dialogue and integration with other relevant public monitoring systems. To this end the PNMSA monitoring system shall introduce greenhouse gases estimations and alert tools in vulnerable areas (IPEA, 2017).

5.6 – Integration

Figure 9 - Average score of the policies selected for the Integration axis.

In relation to the Integration axis, it is envisioned integration to institutions in charge of teaching, research, extension and social empowerment actions. As showed in Figure 9, the highest scoring policies in integrating capacity building institutions were PNAPO, PNRH, PNMA, and PNMC. This axis is transversal to all the others and seeks to integrate the PNMSA construction on a network of institutions with high capillarity in order to improve policy's social engagement and results. For instance, the PNAPO drive demands concerning agroecology and organic food production issues as strategic topics for Embrapa´s research agenda. The policy has established several agroecology research networks through Agroecology Studies Centers (NEAs). These studies centers enclosed a diversity of research, extension and university institutions from all over the country. The success of this initiative are related to PNAPO´s foundation. The PNAPO is a participatory policy that has emerged from civil society coalition. The two governance commissions established under this policy are considered dialogue and articulation spaces for public integration. One is focused on interministerial integration and the other formed by parity of government and civil society representatives (IPEA 2017).

It must also be highlighted the participatory governance of the PNRH. This policy has established National Executive Commissions across 12 Brazilian regions. These commissions are composed by members of the National Water Resources Management System (SINGREH), water users´ sectors and civil society that undertake discussions about regional technical issues and institutional arrangements involving more than

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7,000 people (Brasil, 2006a). The PNRH allowed the emergence of several water resources organizations including NGOs, technical institutions civil society organizations with interest in in protecting natural, social, historical and cultural heritage, other environmental goods, rights of indigenous people and other ethnics minorities (Santilli, 2007).

The lessons learned upon these policies shall improve the foundation of new PNMSA in order to gather participation of several stakeholders and social engagement on sustainable soil and water resources management.

CONCLUSION

Upon this research it was extracted subsidies and lessons learned from current policies in relation to the six foundation axis for the PNMSA. The analysis identified in general the need for greater integration and complementarity among federal ministries and the implemented public policies. The construction of the PNMSA must seek to overcome this deficiency, integrating multisectoral actors and converging policy strategies and instruments into a more comprehensive common platform. In particular, connections with monitoring systems should be established to facilitate coordination between public actions. These measures would be more effective in optimizing the sustainable management of soil and water resources, avoiding overlapping of activities and fostering effective institutional integration.

The seven analyzed policies converge more or less intensely to the PNMSA's building blocks according to the proposed analytical framework. In the Legislation axis, PNMA, PNCMDES, PNRH and PNAPO have greater adherence, while in the Prevention axis, the PNMA, PNCMDES, PNRH and Forest Code policies showed greater alignment within their instruments. In the Conservation axis, PNAPO, PNMC and PNRH stand out with associated financial mechanisms to support farmers adoption of conservation practices. The Recovery axis was the one that presented the least interface with current government instruments, indicating the opportunity for PNMSA to fill this gap to enable the reinsertion of degraded into productive systems.

Regarding policy governance and institutional framework, it can be concluded that the governance mechanisms available on PNAPO and PNRH policies offer a framework with the involvement of different groups of actors in different spheres of coverage, providing greater capillarity, decentralization and social participation in decision making process. The construction of the PNMSA can capitalize on the spaces and governance mechanisms already constituted by these policies, in order to facilitate the involvement of a greater number of stakeholders in the process of public decision. This capillarity becomes essential to address problems and solutions on a smaller scale and customized to local realities, allowing the conformation of greater participation by society in concrete actions with greater potential success in achieving the goals of sustainable management of soil and water resources.

The present transversal analysis of the policies contemplated in this work, raised important recommendations for the construction of the PNMSA particularly for recovery and monitoring strategies. The construction of the PNMSA should prioritize monitoring systems more transparent to society that can dialogue and be complemented with other related policies. The monitoring systems should produce reports about the advance of sustainable management of soil and water resources in an annual basis. In the Recovery axis, the research envisioned the need to built mechanisms to map and prospect scenarios aimed at integrating and advancing actions between ministries, states, municipalities and economic sectors. It is also suggested a design of a collaborative database and agile instruments for reversing degradation processes. Indeed, the Recovery axis, turned out to be the topic with the greatest opportunity for the PNMSA to aggregate contributions and innovations.

This paper shows the opportunity for the PNMSA to cover a policy gap and provide a balanced and integral response to the foreseen axis, based on the learning curve shown in the evaluation of the institutional contents and normative articulation of public policies. The PNMSA has the opportunity and the need to aspire to the highest possible score in its institutional design, also supporting an open and participatory process with social, governmental and private actors, as learned upon the analysis of the other policy framework.

The production of maximum scores in a policy resulting from collective social engagement towards adaptation

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of policy objectives, measures and indicators, shall be realistic and operative to reach PNMSA results, essential for the sustainable rural development of Brazil. This work presents relevant information for the formulation of the PNMSA, enabling the planning of actions that meet the expected axis as well as greater integration between other policies, based on the learning shown in the assessment of the institutional design (its contents and normative articulation) of the policies public analyzed. The greater integration of the policies analyzed together with the incorporation of the advances necessary to meet the strategic axis in the PNMSA formulation can contribute significantly to increase Brazilian agricultural production on a sustainable basis and other ecosystem services.

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TABLES

Table 1 – Guidelines from the analytical axis for the selected polices.

	LEGISLATION
1	Mechanisms for adapting and implementing policies, according to state, watershed and municipality levels;
2	Development of inspection instruments and systems to guarantee the use, management and conservation of soil and wat
3	Warning mechanisms and integration with rural extension service to correct detected inadequacies;
4	Proposition of a fund for priority actions as receipt of financial contributions

Table 2 : Scoring of selected policies with average guidelines for each axis.

	LEGISLATION	**PREVENTION**	**CONSERVATION**	**RECOVERY**	**MONITORING**	**IN**
PNMA	**2**	**2**	**1,50**	**1,67**	**1,33**	**2**
PNRH	**1,75**	**1,75**	**1,75**	**1,33**	**1,33**	**2**
Forest Code	**1,5**	**2**	**2**	**1,33**	**2**	**1,2**
PNAPO	**1,75**	**1,5**	**2,00**	**1,00**	**2**	**2**
PNMC	**1,5**	**1**	**1,75**	**1,67**	**2**	**2**
Proveg	**1,5**	**1**	**1,75**	**1,33**	**2**	**1,5**
PNCDMES	**2**	**1,75**	**2,00**	**1,33**	**2**	**1,7**
Total/axis	1,71	1,57	1,82	1,38	1,81	1,7

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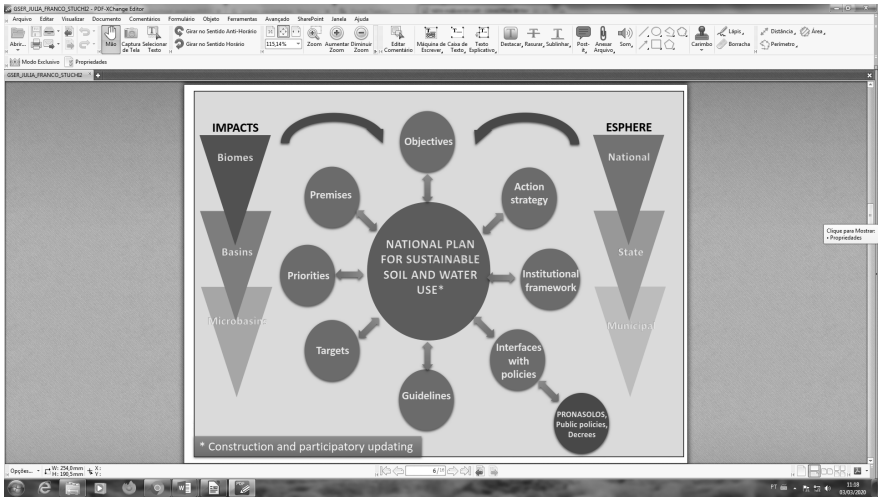

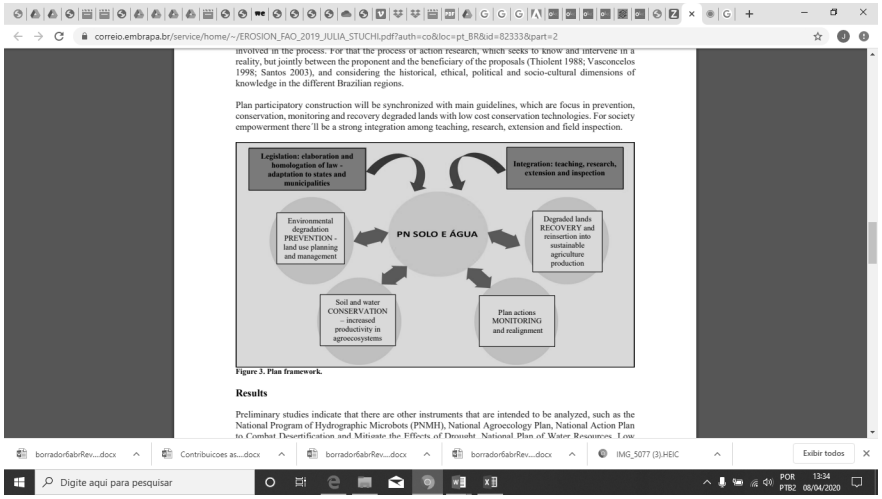

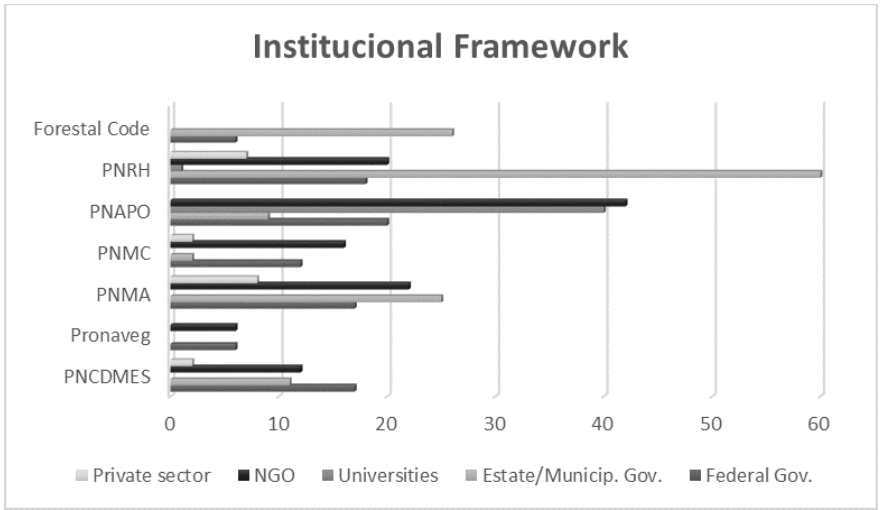

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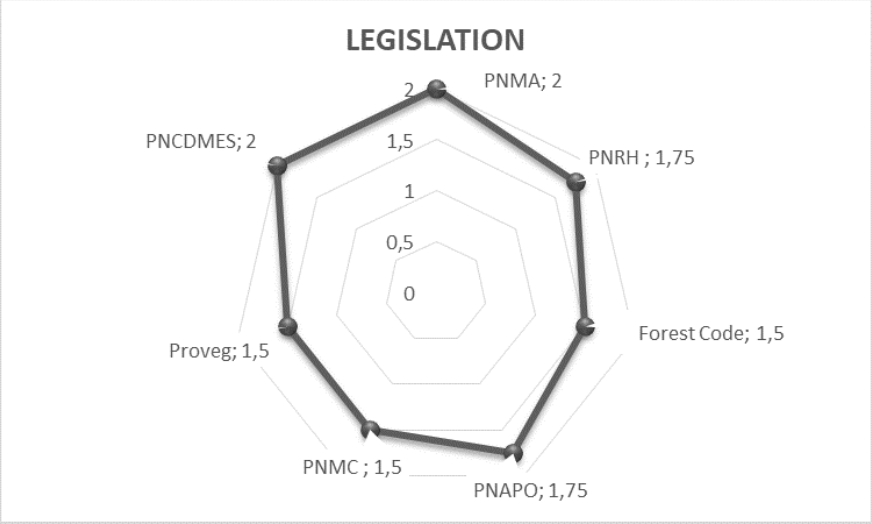

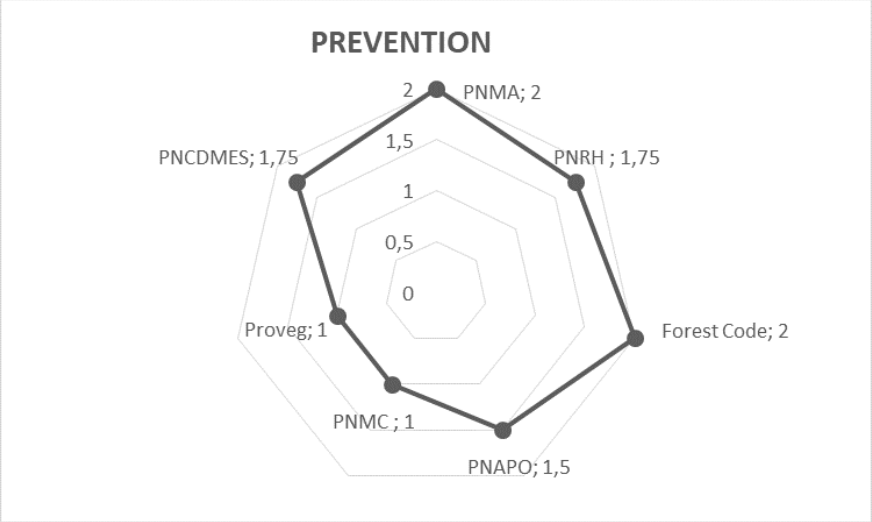

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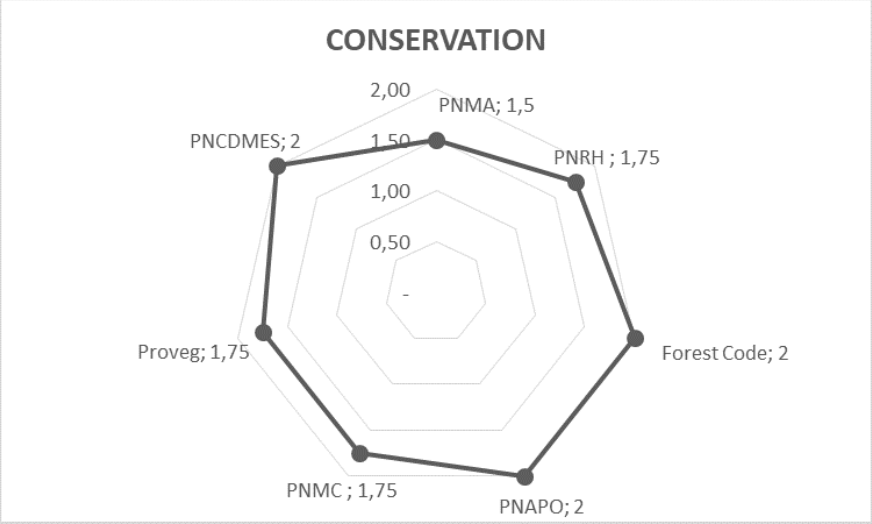

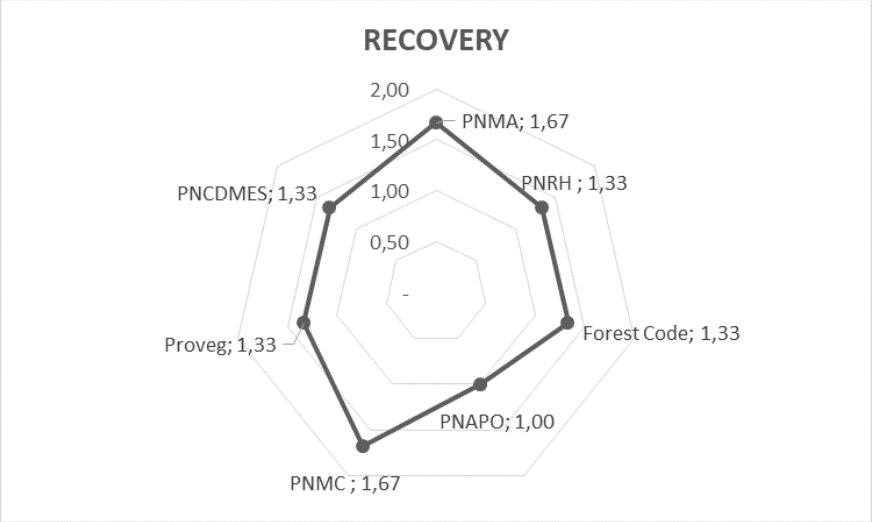

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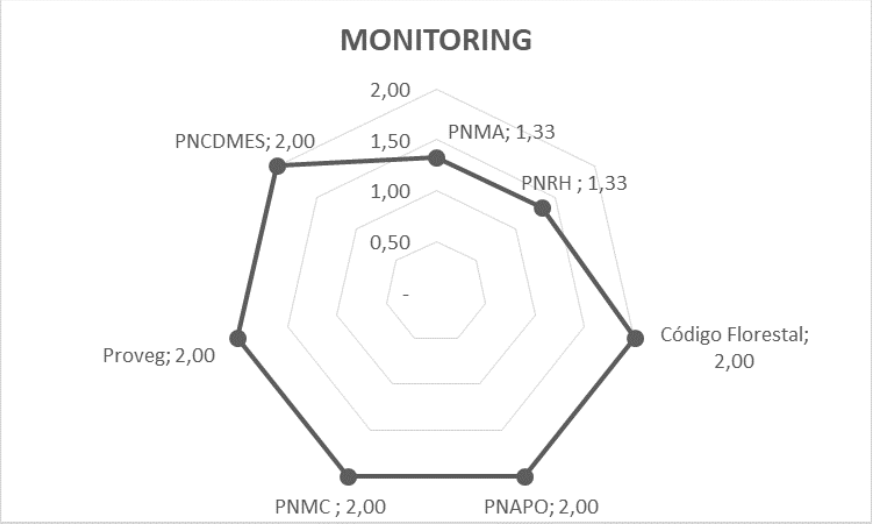

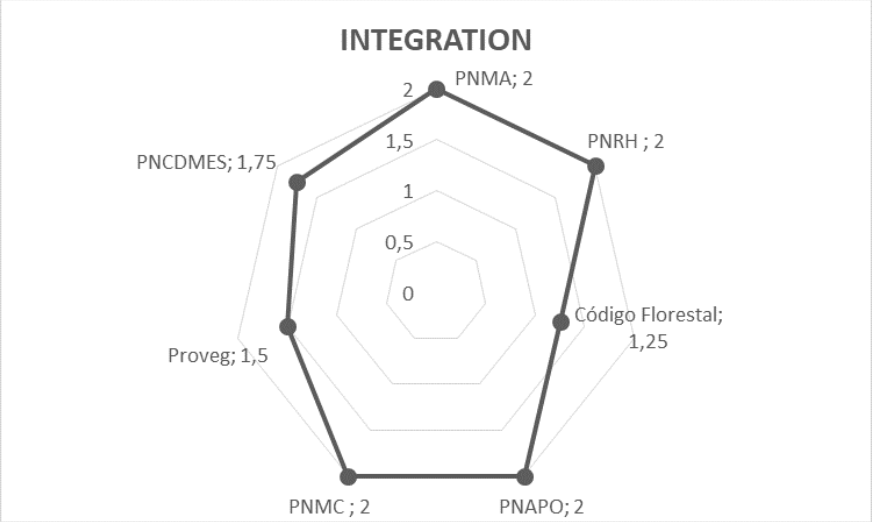

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