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ENVIRONMENTAL REGULARIZATION IN BRAZIL: CHALLENGES FOR THE ADVANCEMENT OF DYNAMIC ANALYSIS

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Abstract: The aim of this study was to map the main bottlenecks and challenges faced by Brazil's federal units in analyzing the Rural Environmental Registry (CAR). To this end, a Journey of Discovery was carried out, including semi-structured qualitative interviews with representatives of all the units, with the aim of collecting detailed information to support decision-making. The results highlighted the existence of bottlenecks related to management, legislation, infrastructure and technical difficulties. The Causality Matrix constructed was important in helping to understand the main root problems and the relationships between them. Thus, the Journey of Discovery not only contributed to a better understanding of the barriers faced, but also to the definition of coordinated actions that can accelerate environmental regularization in the country.
Keywords: Innovation, Decision-making, Roadmap, Rural Environmental Registry.

INTRODUCTION

The Rural Environmental Registry (CAR) is a nationwide electronic public registry, compulsory for all rural properties, with the aim of integrating environmental information on rural properties and possessions relating to Permanent Preservation Areas (APP), restricted use, Legal Reserves, remaining forests and other forms of native vegetation, and consolidated areas (BRASIL, 2012). The CAR is therefore an important database for controlling, monitoring, environmental and economic planning and combating deforestation.

Due to the large volume of data housed in SICAR and the complexity of the parameters to be verified, the analysis stage is a major technical and operational challenge to be faced by the competent state agencies (Lopes, Segovia and Chiavari, 2023). As a way of seeking alternatives to optimize this stage, the Brazilian Forest Service (SFB) has developed, in cooperation with the federal units, the Dynamic Analysis solution.

However, there are many challenges faced by the states in implementing the analyses of the registers, which have hindered progress in the environmental regularization process in the country.

The aim of this work is to carry out a Journey of Discovery to collect detailed and up-to-date information from the Brazilian states on the analysis of CAR registrations, identifying bottlenecks and proposing actions to implement a more efficient analysis. The emphasis is on understanding regional particularities and the specific challenges faced, with a view to supporting the SFB in making strategic decisions.

MATERIAL AND METHODS

The discovery journey is proposed when you want to have a holistic view of the project. To do this, it is necessary to collect as much information as possible in order to provide a better understanding of the demand and its expectations (Stickdorn et al., 2020). The aim is to enable the challenges to be addressed in the next stages to be framed.

To this end, this Journey of Discovery included remote semi-structured qualitative interviews based on previous studies. A total of 27 interviews were carried out with representatives from all of Brazil's Federative Units, in order to understand their situation in relation to the analysis of the registers.

In order to provide better guidance at the time of the interviews, a script was drawn up focused on effectively achieving the central objective of the day: status of the individual and dynamic analysis process, challenges, bottlenecks and planning for the implementation of the Environmental Regularization Program - PRA.

The interviews were fundamental to understanding and elucidating the general panorama of the CAR's analysis and to identifying the actions needed to support the states in carrying out the process more quickly and in a more targeted manner.

RESULTS AND DISCUSSION

The cycle of discovery conducted through individualized conversations with representatives of the Federative Units of Brazil had positive results, which made it possible to obtain detailed and up-to-date information on the CAR analysis process. This data is essential for implementing effective strategies to solve the main challenges faced and speed up the progress of registration analyses.

It is true that the complexity of the issue makes it difficult to come up with possible explanations for such different panoramas, even among the states that had already started the analysis process. While some states have more than 60% of their registers analyzed, others have minimal percentages and have only carried out analyses on demand, be it judicial or for licensing purposes.

However, looking at the five most advanced states, it is possible to see that they have the support of third-party companies helping with the analysis and receive financial resources from projects. These events therefore seem to be important sources of incentive to speed up the process.

In general, the low percentages of CAR analysis in most of the states interviewed is a reflection of the numerous bottlenecks faced by state teams that end up hindering the progress of the process.

In order to better understand the different variables that exist in the context of the analysis of the registers and how they are related, a Causality Matrix was constructed. This material is in line with the *Innovation System* approach, which can be understood as combining systemic thinking and the innovation process to enable transformative change within a complex system (Viegas, 2018).

In the Causality Matrix, we start from different "Root Problems" that branch out to a final common problem, which is that the analysis of registrations is not being carried out effectively and the consequent delay in implementing the PRA (Figure 1). The Root Problems were identified and classified into four main themes:

1. Lack of awareness among managers of the importance of the agenda, related to the theme of Management;

2. Legislative issues related to management;

3. Non-existent, outdated and/or low--quality reference databases related to the theme of Inputs;

4. System-related problems, related to the System theme.

ACTION PLAN

After identifying the main bottlenecks and interactions between them, we sought to identify specific actions that could help speed up the flow of registration analysis and, consequently, the environmental regularization process.

In this sense, as the final stage of the journey of discovery, we drew up a roadmap with the demands in high, medium and low priority, in order to direct actions to favor the process of analysis and environmental regularization. It should be noted that the criteria that appear as high priority were classified as such because they were the most mentioned by the representatives of the states, and so on.

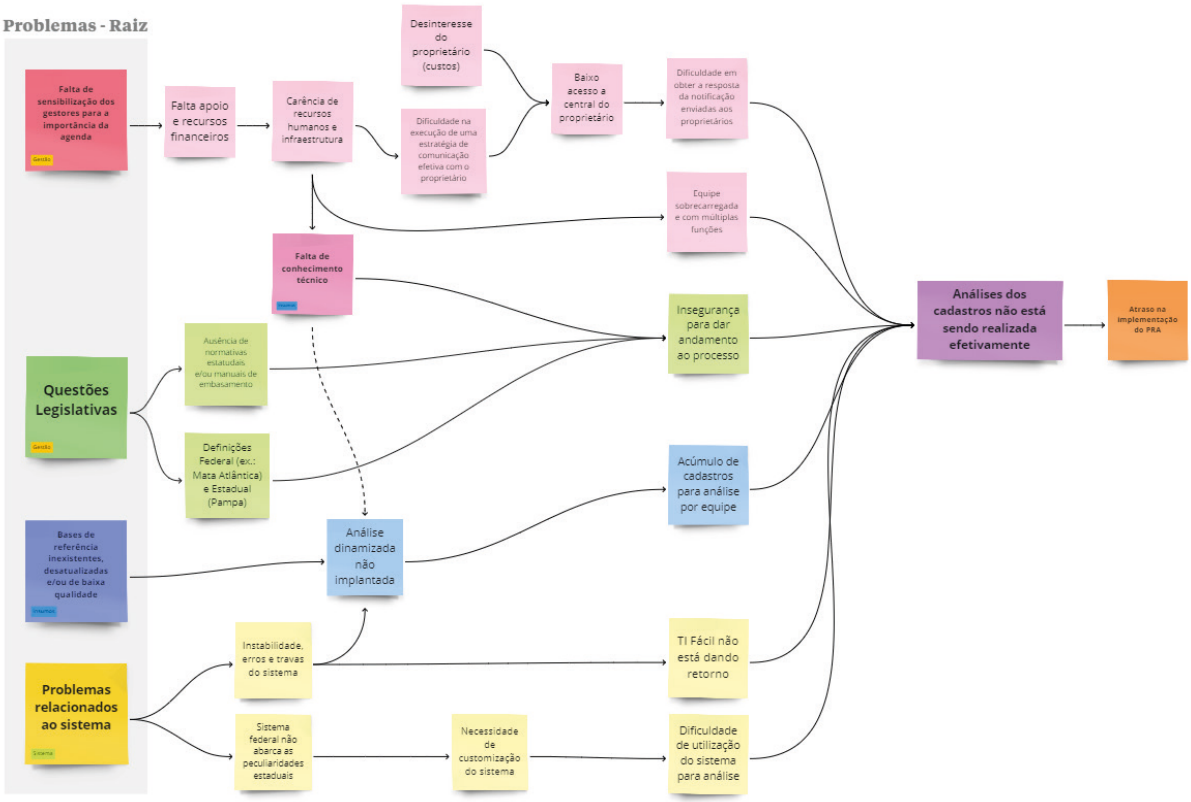

Figure 1 - Causality matrix of the process of analyzing the Rural Environmental Registry.

Actions	Objective
Treatment for Absence of Baseline	This demand arose to prevent records from being held up in the Dynamized Analysis flow due to the lack of the necessary reference base. If ArcGIS detects the absence of a reference base, a message is sent to SICAR informing it that the IR should be returned with the status "SEM_BASE_REFERENCIA". Properties with inputs continue to be processed normally.
Rectification of Complex Properties	Given the high complexity of some registers, problems arose when rectifying them, due to the offline register module being limited to supporting.ret files. The solution involved installing a specialized application for registering and rectifying complex properties.
Implementation of the New SICAR Website	It aims to unify the visual identity, improve navigation, redefine functionalities, improve accessibility in the modules and optimize content management.
Updating Bases	- Updating INCRA's Settlement Database: Checking and adapting the new database of settlement project perimeters to maintain consistency in the SICAR database. - Updating ICMBio's Conservation Units Database: Updating the Conservation Units database in SICAR and making adjustments to the automatic filter to identify overlaps. - Updating FUNAI's Indigenous Lands Database: Updating the Indigenous Lands database, covering all phases from "Under study" to "Regularized". - Updating the IBGE Municipalities Database: Updating the IBGE database and values of municipalities' Fiscal Modules for the year 2022.
Improvements to the Team Analysis and Dynamic Analysis Module	In order to optimize the registration analysis process, the functionality to cancel analyses in progress or completed has been added. In the Dynamic Analysis Module, the "Cancel Data Review" function has been enabled for different phases of the process, and in the Team Analysis Module, the "Cancel Analysis" function has been implemented for various stages of analysis.
Updating Satellite Images in the Team Analysis Module	In order to improve the visualization of the analysis maps, satellite images from the dynamic analysis module were added to the main team analysis map. The images in the technical opinion and technical analysis report have also been updated to reflect the new images inserted into the system.

Table 1. Description of some of the actions carried out to improve SICAR.

ACTIVITIES CARRIED OUT

Since the start of the journey of discovery, when information from all the states was compiled to support the SFB, various actions have been carried out to date to optimize the system's technical issues (Table 1).

CONCLUSION

The Journey of Discovery revealed the importance of a collaborative and detailed approach to understanding the diverse panorama of Brazilian states in relation to the analysis of CAR registrations. The information collected shows that problems vary widely between states, including management challenges, lack of resources, technical difficulties and legislative issues. These variations highlight the need for customized solutions and the importance of considering regional specificities. The process of gathering information from the different focal points proved essential to identifying and mapping these challenges, providing a solid basis for adopting effective strategies to optimize the process of team-based and streamlined analysis. Thus, the journey of discovery not only contributed to a better understanding of the barriers faced, but also to the definition of concrete actions that can accelerate environmental regularization in the country.

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