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PLANNING AND MANAGING THE TERRITORY OF THE PIPA AND BARRA DE TABATINGA CLIFFS - RIO GRANDE DO NORTE

Planejamento e gestão do território das falésias de Pipa e Barra de Tabatinga – Rio Grande do Norte

Planification et gestion du territoire des falaises de Pipa et Barra de Tabatinga – Rio Grande do Norte

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ABSTRACT

The planning and management of the territory of natural areas, with an intense flow of tourists, such as those of the Pipa and Barra de Tabatinga Cliffs – Rio Grande do Norte, involve a very broad scenario of measures, strategies and actions, demanding an analysis beyond the physical-natural bias and its processes. It is in this direction that this article discusses the normative management of the territory in the area of cliffs, its challenges/contradictions and the strategies for the territorial planning of spaces of this nature. To this end, the following methodological procedures were carried out: bibliographic and documentary survey, focusing on the identification of the normative instruments that guide the use and occupation of the study areas, fieldwork in Pipa and Tabatinga and technical meetings with representatives of the Institute for Sustainable Development and Environment (IDEMA), the Civil Defense and the municipal secretariats of environment and urbanism, between February 2021 and February 2022. In summary, the results indicate that it is necessary to think about the forms, functions, processes and structures that make up the landscape scenario of the cliffs and plan their actions and uses in the short, medium and long term. In the end, a systematization of territorial management at different scales is suggested.

Keywords: Norm territory; Territoy as a norm; Land Use; Cliffs project.

RESUMO

O planejamento e gestão do território de áreas naturais, com intenso fluxo de turistas, como as das Falésias de Pipa e Barra de Tabatinga – Rio Grande do Norte, envolvem um cenário muito amplo de medidas, estratégias e ações, demandando uma análise para além do viés físico-natural e seus processos. É nesta direção que esse artigo discute a gestão normativa do território na área de falésias, seus desafios/contradições e as estratégias para o planejamento territorial de espaços desta natureza. Para tanto, foram realizados os seguintes procedimentos metodológicos: levantamento bibliográfico e documental, com foco na identificação dos instrumentos normativos que orientam o uso e ocupação das áreas de estudo, trabalho de campo em Pipa e Tabatinga e reuniões técnicas com representantes do Instituto de Desenvolvimento Sustentável e Meio Ambiente (IDEMA), Defesa Civil e secretarias municipais de meio ambiente e urbanismo, entre fevereiro de 2021 e fevereiro de 2022. Em síntese, os resultados apontam que é preciso pensar as formas, funções, processos e estruturas que compõem o cenário paisagístico das falésias e planejar as ações e usos delas, no curto, médio e longo prazo. Ao final, sugere-se uma sistematização da gestão territorial em diferentes escalas.

Palavras-chave: Território normado; Território enquanto norma; Uso do Solo; Projeto Falésias.

RÉSUMÉ

La planification et la gestion du territoire des espaces naturels, avec un flux intense de touristes, comme celles des falaises de Pipa et de Barra de Tabatinga – Rio Grande do Norte, impliquent un scénario très large de mesures, de stratégies et d'actions, exigeant une analyse au-delà du biais physique-naturel et de ses processus. C'est dans ce sens que cet article aborde la gestion normative du territoire dans le domaine des falaises, ses défis/contradictions et les stratégies d'aménagement territorial d'espaces de cette nature. À cette fin, les procédures méthodologiques suivantes ont été mises en œuvre : enquête bibliographique et documentaire, axée sur l'identification des instruments normatifs qui guident l'utilisation et l'occupation des zones d'étude, travail de terrain à Pipa et Tabatinga, et réunions techniques avec des représentants de l'Institut pour le développement durable et l'environnement (IDEMA), de la Protection civile et des secrétariats municipaux de l'environnement et de l'urbanisme, entre février 2021 et février 2022. En résumé, les résultats indiquent qu'il est nécessaire de réfléchir aux formes, aux fonctions, aux processus et aux structures qui composent le scénario paysager des falaises et de planifier leurs actions et leurs usages à court, moyen et long terme. Au final, une systématisation de la gestion territoriale à différentes échelles est proposée.

Mots-clés: Territoire normé; Le territoire comme norme; utilisation des terres; Projet falaises.

1 INTRODUÇÃO

Cliffs are present in several countries and constitute coastal escarpments. They result from marine erosion on rock formations, perform different ecological and sedimentary functions in the coastal region, and may be in a remodeling stage. This process results in unique geomorphological features, with an intense tourist and economic potential for these landscapes (Bird, 2016).

A systemic view in understanding these areas' dynamics demonstrates the interdependence of their associated subsystems, forms-processes-natural functions, and

forms-processes-social functions. For example, any change in the economic dimension will change the social dimension, which in turn can lead to spatial, ecological, or cultural changes. Therefore, to achieve sustainable use of cliff areas, it is necessary to know and understand the carrying capacity of the physical or ecological environment in which they are inserted and how they interact with the different uses established for land management capable of standardizing and monitoring these spaces (Amorim; Maia, 2022).

From this perspective, the cliff area must be understood through the practices of "power relations necessary to direct, in time and space, the coherence of multiple purposes, decisions and actions" (Becker, 1991, p. 47); in other words, through the management of the territory, an important reference point for the organization of inclusive public policies that promote equality (Becker, 2005).

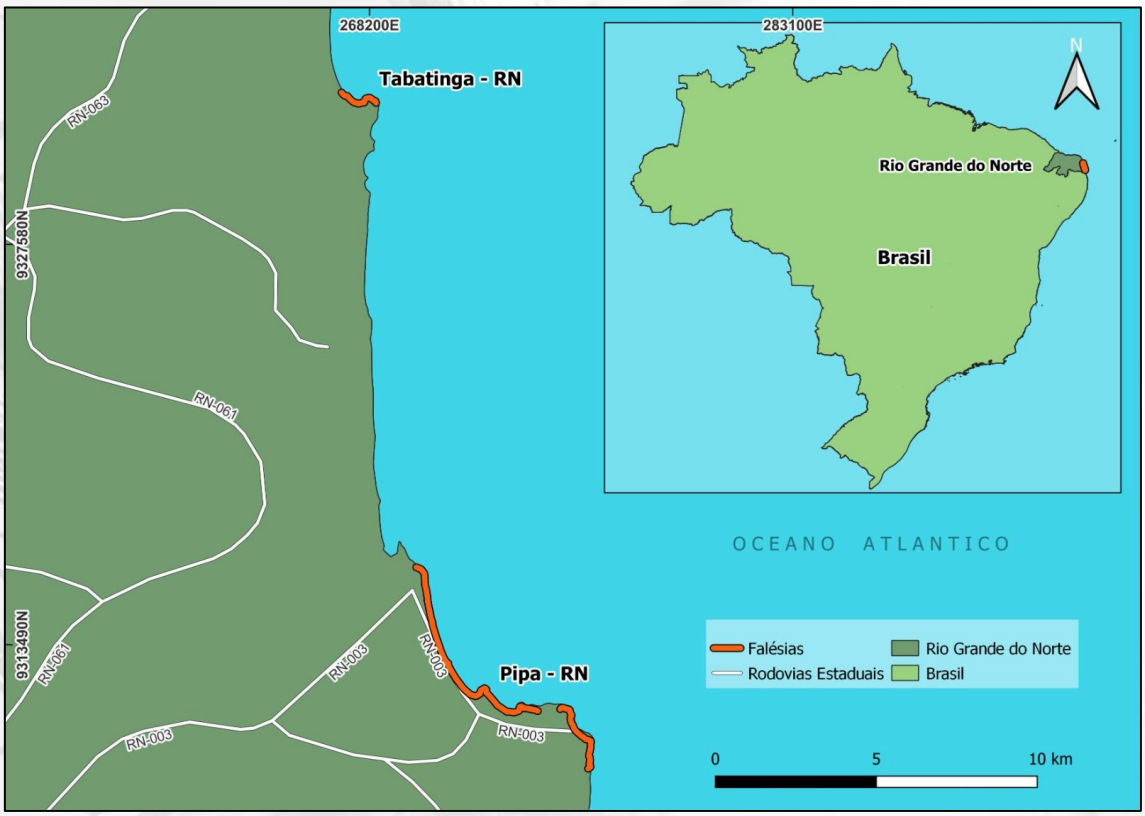
The Cliffs Project pointed out in its preliminary reports (volumes 1 and 2) that for the Brazilian state to have sovereignty and security in the coastal environment of the cliffs, it is necessary to understand this area in terms of both its geomorphological characteristics and planning (Amorim; Maia, 2021a, 2021b). This area makes up a mosaic of exceptions in both directions. Its distinctive scenic beauty arouses interest in landscape use, reflected in the densification of commercial occupation aimed at the economical use of the landscape as a resource.

Against this backdrop, there is a contradiction between the "norm" and "normativity" in cliff areas. This is because normativity tends to be restrictive, trying to guarantee the existence of the landscape resource, while the norm tends to expand in the territory, trying to ensure the maximized economic use of this resource (Amorim; Maia, 2022). Faced with these two competing trends, land management becomes a challenge in many global contexts where coastlines produce cliff features, as in the case of the Pipa and Tabatinga cliffs.

From this perspective, this work aims to discuss the regulatory management of the territory in the Pipa and Tabatinga cliff area, its challenges/contradictions, and the strategies for territorial planning of spaces of this nature. The study area comprises two stretches of seafront with cliffs: Pipa District in the municipality of Tibau do Sul-RN and Barra de Tabatinga in Nísia Floresta-RN, both of which consist of a "section of the seafront covered by part or all of the landscape and geomorphological unit of the seafront, delimited as a space for intervention and management," as specified in item XIII, Art. 2 of Decree No. 5.300/2004.

The Pipa area comprises the beaches of Cacimbinha, Madeiro, Baia dos Golfinhos, and Praia do Centro, between the coordinates 6°13'39.97"S 35º02'54.84"O and 6º12'04.55"S 35º04'54.90"O, with an average altitude of 25 meters. Barra de Tabatinga comprises the stretch of cliffs located between coordinates 6º03'21.72"S 35º05'53.29"O and 6º02'46.23"S 35º06'35.48", with an average altitude of 27 meters. Both areas have exuberant cliffs, ranging in height from 10 to 31 meters, carved out of the conglomeratic sandstones of the Barreiras Formation and subsequent depositions, where different types of occupation have been consolidated: houses, bars, restaurants, inns, and natural viewpoints for contemplating the landscape (Figure 01).

Figure 01 – Location map of Tabatinga and Pipa - RN



Source: IBGE, 2022. Prepared by the authors, 2023.

To this end, the main methodological procedures carried out were a bibliographic and documentary survey, focusing on identifying the regulatory instruments that guide the use and occupation of the study areas, fieldwork in Pipa and Tabatinga, which aimed to recognize the distance between the buildings and the edges of the cliffs and the types of use of this territory (bars, restaurants, inns and houses), at this stage photographic records were made using a drone, model Phantom 4 pro, a quadcopter equipped with a 4k camera,

1-inch sensor and 20MP. The drone is licensed by ANAC (National et al. Agency) with registration PP-00390777. The flights were carried out at 60 meters in manual mode, with frontal and lateral overlap obtained multi-directionally. Finally, technical meetings were held with the Institute for Sustainable Development and the Environment (IDEMA), Civil Defence, and the municipal environmental and town planning departments between February 2021 and February 2022.

2 LAND MANAGEMENT: BETWEEN NORM AND NORMATIVITY

Establishing an integrated relationship with these spaces requires different forms of planning and implementation of public policies that meet basic demands, equity between and within generations, economic development, and the conservation of environmental capital. To this end, these areas are the targets of multi-scalar regulatory instruments that have repercussions on the use of this territory. In the words of Moraes (2005), territory corresponds to:

> Terrestrial materiality houses a country's natural heritage, production structures, and the spaces where society reproduces itself. It is where the sources and stocks of natural resources available to a given society and existing environmental resources are allocated. This is where the spatial forms organized by society over time accumulate (produced space). These forms are added to the soil where they were built, becoming territorial structures, conditions of production, and reproduction at each juncture considered (Moraes, 2005, p. 43).

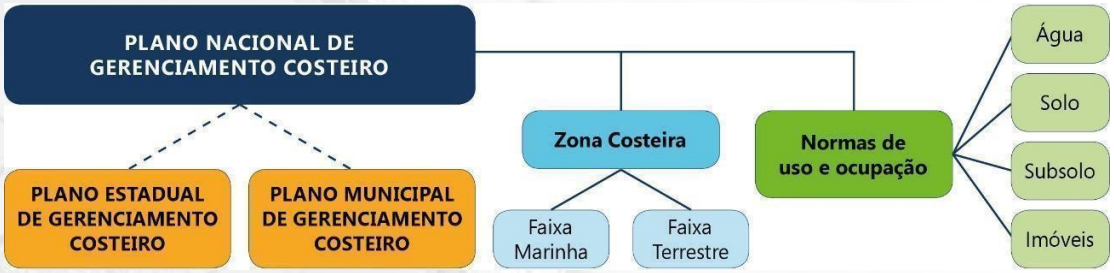
To talk about cliff areas is to talk about territory, and to talk about politics is to reflect on their links with society and the state and their power relations (Mello-Théry, 2011). In other words, cliffs are characterized as natural arrangements modified by social use through different engineering systems and political, cultural, and economic arrangements that give a specific meaning and value to the use of these areas.

Therefore, these geomorphological features make up the mosaic of the landscape, the representation of which corresponds to the projected strategy based on the different uses of this territory. Public legal instruments govern these areas' administration, regulation, and supervision on a national, state, and municipal scale; the set of these instruments, their supervising agents, and legislators make up what we here call the "normativity" of the territorial management to be analyzed (Amorim; Maia, 2022).

In the specific context of Pipa and Barra de Tabatinga, the spontaneous use and occupation of the cliff area precede most of its normativity. Thus, as demographic pressure on the environment increased, normativity intensified or relaxed, depending on the political actors negotiating each part of the space.

The state regulates cliff areas through the National Coastal Management Plan, which guides the physical organization of these areas to create a rational use of this space (Federal Law No. 7.661/1988) (Figure 02).

Figure 02 – National Coastal Management Plan



Source: Law 7.661/1988.

This Plan shows concern for the sustainable use of the natural resources of the coastal zone. It proposes integrated planning for using these resources, establishing guidelines for the territorial occupation of coastal spaces. This law defines the "Coastal Zone" as "the geographical space where air, sea, and land interact, including its renewable or non-renewable resources, encompassing a maritime strip and a land strip, which will be defined in the respective Plans" (BRASIL, 1988). It establishes that states and municipalities can set up their own Coastal Management Plans and that the Federal, State, and Municipal Coastal Management Plans to be set up can lay down rules for the use and occupation of soil, subsoil, and water, making it clear that licensing will be strongly determined by these plans (Brasil, 1988).

Also, at the federal level, two laws were published in 2012 with important implications for the management of cliff areas. Federal Law 12.608/2012 establishes the National Civil Protection and Defence Policy, and Law 12.651/2012 provides for the Protection of Native Vegetation (Brasil, 2012a; 2012b). Also noteworthy is Federal Law No. 13.465/2017, which has implications for the administration of cliff areas by regularising rural and urban land areas. At the municipal level, w e highlight Complementary Municipal Law No. 1/2007,

which provides for the Master Plan of the Municipality of Nísia Floresta and makes other provisions, and Complementary Municipal Law No. 6/2008, which serves the Master Plan of Tibau do Sul (Nísia Floresta, 2007; Tibau do Sul, 2008).

This set of laws provides guidelines for the planning and effecting of national and regional plans in cliff areas. Based on these instruments, as presented in volumes 1 and 2 of the report, it is possible to see that there is a body of legislation designed to regulate the conditions of use and occupation on the Pipa and Tabatinga cliffs (see the *Business Intelligence (*B.I.) *dashboard* drawn up by the cliffs project at the following link: https://datastudio.google.com/s/nKV5Ch97WG4).

In summary, the land-use planning documents for the Pipa and Barra de Tabatinga cliff areas are organized in four formats:

- **regulations**, land use, and occupation legislation**;**
- **supervision**, control of activities that are in line with current regulations;
- **preventive**, characterized by the delimitation of cliff areas, environmental impact assessments, risk analyses, and ecological licensing and;
- **corrective measures** are direct interventions to implement and train maintenance and monitoring works in the area.

All these regulatory instruments aim to show the presence of cliffs in the area on different scales. However, the reality is that they often come up against the rules established by the use of space, the historical construction of the site, and the contradictions of the regulatory means themselves, making the mosaic of Territorial Management in the area complex.

2.1 Land use and occupation management

Beyond the legal instruments that guide the management process of the areas detailed here (normed territory), it is necessary to analyze how the use and occupation of these spaces is established, in other words, the territory as a norm.

The use of the territory takes place through different agents and actors, depending on the geographical scale at which the phenomenon is observed, and, according to Souza (2005, p. 253), "place is the tangible thing that receives the impacts of the world. The world remotely controls place". Therefore, the only possibility of resistance to the processes lies in the place, given the possibility of communication and political construction. In Pipa and

Barra de Tabatinga, the dynamics of the places are not a direct consequence of a process of territorial planning by the state but rather reflect the attempt by local actors (fishermen, caiçaras, small and large business people) to make the landscape attractive to the tourist market, to make a profit (Figure 03).

Figure 03 – Stairs built to facilitate hotel guests' access to the beach in Pipa

Source: Author's collection, 2021.

This dynamic, which began on a small scale with more modest players, has gained momentum over the last three decades, attracting investors with high financial capacity and high-standard constructions (Figure 04). If, on the one hand, the Potiguar coast reveals the particularities of the place, on the other hand, it has become part of an international financing and tourism network, building its own operating rules based on arrangements with public and regulatory bodies, making the norm more expressive than the normative, generating increased demographic and economic pressure within the restricted range for buildings (Amorim; Maia, 2022).

Figure 04 – Urban densification on the edge of the cliff in Pipa

Source: Author's collection, 2021.

The areas with intense tourism activities in the Brazilian Northeast are made up of contiguous and networked places comprising the national state, society, and territorial configuration, with multiple federated management centers, multiple nuclei of public and private agents, and territorial organizations that become progressively denser as it reflects the multiplicity of specific powers and their development projects materialized on the Territory (Santos, 2005; Ruckert, 2005). All the technical forms it contains are products of norms, with varying normative densities, depending on the quality and quantity with which these two variables are distributed in the territory, which are incorporated into the legal system (Antas Júnior, 2005). It is important to consider that normative bases are not restricted to knowledge of sectoral policy plans, programs, and projects (Frey, 2000). When talking about norms, Antas Junior (2005, p. 60) emphasizes that:

> This is linked to the very structuring and organization of the territory, carried out according to a rationality that is intended to be as effective as possible in the current economic order, regulating behavior and guiding actions based on what seems useful to that order (Antas Junior, 2005, p.60).

From this perspective, normatisation through actions refers to the normed territory, while the territory as norm refers to the territorial configuration that produces norms. In the

normed territory, the repressive element takes precedence over the others; in the territory as the norm, the communicational element provides the guiding reference (Antas Junior, 2005; Santos, 2009). In Pipa and Barra de Tabatinga, the state assumes the power to regulate the use and occupation of the cliff areas. However, as exemplified above, the use of this territory is influenced by different agents and actors whose interests define the territorial configuration of these areas without necessarily following the regulations imposed by the state.

This recognizes the importance of regulatory instruments for managing these areas. However, their effectiveness has been restricted, partly due to the impossibility of implementing all the planned actions, which may reflect the need for more financial, human, and technical resources. When discussing the importance of administrative and judicial legal instruments for environmental management, Malheiros (2001, p. 343) emphasizes that "they are effective instruments for sustainable development. "However, ecological policies "depend on political will towards environmental issues and the social, economic and technical resources available for their implementation" (Almeida, 2007, p. 343).

The difficulty of putting into practice development proposals agreed upon at different scales is due to the existence of conflicting interests in the use of the areas. The mapping of land use and occupation on the cliffs of Barra de Tabatinga and Pipa shows the different forms of occupation of this territory, the difficulty of the normed territory establishing itself as a norm, and how the actions materialized in these areas are the reflection of one or more agents imbued with purpose (Amorim; Maia, 2021a, 2021b).

The contradictions between the instruments that regulate land use and the occupation of the cliff areas of Barra de Tabatinga and Pipa are evident in the 10-meter, 100-metre (Law No. 12.651/2012), and 33-metre distance from the escarpment (State Law No. 7.871/2000) or 33 metre marine land, according to Decree-Law No. 9.760946. Decree-Law no. 9.760/1946. The article of the state law that specified the 33-meter strip at the edge of the escarpment was revoked by A.D.I.: 74680RN2007.007468-0-TJ-RN, but before its revocation, several developments were licensed based on this instrument.

Article 4 of the 2012 Forest Code (Law No. 12.651/2012) deals with Permanent Preservation Areas (P.P.A.s), and item VIII stipulates that areas bordering tablelands or plateaus must not be occupied, up to the line where the relief breaks, in a strip of no less than one hundred meters in horizontal projections (Brasil, 2012).

At the municipal level, the Master Plan for Nísia Floresta, where Barra de Tabatinga is located, considers the first 33 meters of the cliff "*unedif*ying," with no buildings allowed.

However, the usage of this land on the edge of the cliffs presents structures that go against what is established in these laws, with built-up areas, constructions, car parks, and swimming pools (Nísia Floresta, 2007).

Lastly, the ten-metre strip corresponds to the area at risk of mass movement, as indicated in Report 2. It is not delimited according to legal instruments but is intended for the safety of buildings and people. Some stretches, such as Praia do Centro in Pipa, are noteworthy for their structures: built-up areas, cemeteries, stairs, car parks, and swimming pools (Figure 05).

Figure 05 – Occupation configuration on the cliff edge of Praia do Centro in Pipa

Source: Author's collection, 2021.

Therefore, although the legal framework establishes limits for the use and occupation of cliff edge areas, the historical process of occupation, often carried out spontaneously, with factors involved in the interplay of economic, political, and cultural interests surrounding these geomorphological features, generate disputes over the use of this territory and materialize in its current territorial configuration (Amorim; Maia, 2022).

3 SPATIAL PLANNING AS A POLICY

Faced with a scenario in which the norm and the normative conflict, generating doubts about where and how to invest in Pipa and Tabatinga, the Falésias Project has offered, since its preliminary analyses (Amorim; Maia, 2021a, 2021b), some recommendations to indicate strategies for the management of the coastal area, analyzed here from the perspective of Territorial Management.

3.1 Collective organization of a "divestment plan."

The previous report indicated the need to draw up a divestment plan, establishing criteria and deadlines for buildings located in the area most at risk, a 10-metre strip from the cliff edge, to be removed, free of charge for the government. Of course, this process must be planned, considering the erosive process of the escarpment's retreat, with the strip indicated here being mobile, always considering the cliff's edge's position or the base's erosional re-entrance.

It is recommended that the current line of the cliffs analyzed here be defined, taking into account all the technical rigors of the georeferencing standards, through a legal instrument similar to the position of the 1831 mean high tide line, provided for in Decree-Law No. 9,760/1946. This line will serve as a reference for future decision-making, such as measuring cliff retreats and applying the divestment strip. The instrument should provide for updating the baseline's position, giving rise to the need for divestment for the risk band resulting from this update.

It is necessary to stress the importance of monitoring being carried out systematically, globally, and by public authorities, ensuring technical-scientific rigor, making it available to decision-making and control bodies, and allowing specific processes to be correlated with the context of the entire cliff area.

Transferring monitoring to private individuals, who will only be responsible for measuring parameters related to their property, can result in problems interpreting the system as a whole. The coastline is dynamic, with complex hydrodynamic and geomorphological processes that vary in time and space. In this context, the divestment and monitoring plan are organized on two fronts:

The divestment plan for the 10m of the cliff edge (short-term measure), which may or may not involve the immediate removal of structures, depending on the assessment of the engineering systems, should accompany the Plan.

So, to better land management, this Plan can go through three phases:

- Technical and scientific presentation of the proposal for the divestment project;
- Formation of a collective involving managers and representatives of the public authorities, representatives of the establishments, and the local population to agree on the divestment plan;
- Implementation by the public authorities of immediate measures, monitoring, and organization of strategies for drawing up planning instruments.

Monitoring plan for **the 100 m strip from the edge of the cliff** (medium-term measure), monitoring of the entire strip 100 meters from the edge of the cliff, including road structures and concessions for new interventions. Permanent assessment of structures and impacts, analyzing the risk index of existing structures. In this area and all the communities, there is a need to draw up a multifunctional register detailing the nature and function of each investment.

Regarding the emergency for the divestment strip, the works by Severo (2005) and Lima *et al.* (2020) point to the need to implement a minimum protection strip of 10 meters wide, starting from the cliff edge. Severo (2005) and Lima et al. (2020) indicate the need to monitor the 100-meter strip, considering the need to make uses compatible with the carrying capacity of the physical environment since interventions that generate significant environmental impacts could produce reverberations that accelerate the erosion process of the cliffs.

By analyzing the reality dealt with here through the logic of territorial management, it is understood that the "Falésias Project," as well as contributing to an understanding of the geomorphological processes in the area, makes it possible to point out some points of territorial organization in line with Santos (2008), **forms, functions**, **structures and processes** linked to the process of disinvestment:

- Human occupations must be understood in terms of their origin and social function. This is represented using a flow map that reveals how the surface is transformed and quantifies these impacts. This flow map should be used by local authorities and investors to plan and make decisions.

- **Functions** that reveal the interconnection between economic production and the use of space in the risk area can be evidenced through the multifunctional land registry.
- The **structures**, because the results of the Cliffs Project show that environmental safety in coastal space management depends on the continuous monitoring of a set of structures: road and sea routes, pedestrian and vehicular access to the beach area, economic occupation of the beach, areas for special tourism use (viewpoints and routes) and commercial and service areas along the cliffs. All these structures can be monitored using ongoing technical reports.
- The **processes** that deal with the set of the three previous elements during their execution. The process refers to the nature of things unfolding in the Territory (Santos, 2008). It, therefore, includes monitoring the three elements indicated at different scales: governance (municipalities, states, and the Federal Government), social organizations (civil society and the third sector), corporate uses of the territory (companies and investments), scientific institutionalization (professionals and scientific research institutions) and the diversity of civil society actors. In the Falésias Project, it can be seen that these processes are marked in the historical evolution of the localities and the different categories of use and management. They also point out the weaknesses, contradictions, and inconsistencies to be considered in the interplay of actors that make up the economic and social production generated by the scenic beauty of the cliffs and are a privileged place to observe the contradictions between the norm and normativity. To constantly monitor the process, it is proposed that monitoring carry out an Analytical Cartography along the lines of Théry and Mello-Théry (2018) and Nonato Junior *et al*. (2018), pointing out the dynamics and disparities involved in managing the territory.

3.2 Territorial management in the face of the reorganization of materialities and infrastructures in the cliff area

Analyzing the contributions made by the Falésias Project in its first two technical reports (Amorim; Maia, 2021a, 2021b), it can be seen that these documents point to the need to review the organization of the territory's materialities in the four elements listed in the previous section. In addition, as well as planning for this scenario (change of strategy, articulation of scales and actors), it is necessary to consider the procedure of everyday events, organizing networks: macrostructure and microstructure, aimed at territorial

management solutions. He gives an example of two cases in the project, considering both specificities.

Material transformations of a macro-structural nature involve different public bodies working together to identify demands, make decisions, and carry out interventions in a broader spectrum of complex areas. For example, the rainwater drainage of state highways in the stretches close to the cliffs requires decision-making and implementation of the action (Figure 06).

Figure 06 – Section of the RN-063 near the edge of the Barra de Tabatinga cliff

Source: Author's collection, 2021.

RN-063, located near the Barra de Tabatinga cliff, bordering the Mirante dos Golfinhos (Figure 07), has points less than 10 meters from the cliff's edge. This structure is the main access route to the beaches of Tabatinga, Camurupim, Barreta, and Malembá and the route for 4x4 vehicles that tour the eastern coast of Rio Grande do Norte. Therefore, the measures and decisions or lack of action have macro-structural implications.

Figure 07 – Escarpment of the cliff area at Mirante dos Golfinhos in Barra de Tabatinga

Source: Author's collection, 2021.

The context presented is no longer a technical, environmental issue but a strategic one that could determine the development or deterioration of a large area in the state where recreational and tourist uses exist. It is a specific issue that has become an "analyzing element" for the setting of the territory in that area.

In the microstructural spectrum, the influence of materialities on effective local land management is not limited to major strategic issues. For example, they involve developing good tools for people to use daily, such as signposting and education plans for visiting risk areas (Figure 08).

The signposts installed at different points along the coastline with cliffs demonstrate the actions of the public authorities to guide on the risks. However, they reflect the region's environmental challenges: strong winds, wave energy, seas, and depredation. This calls for a signposting and education plan to be devised, involving its implementation on an ongoing basis.

Figure 08 - Guidance sign on "landslide risk area" on the Barra de Tabatinga cliff.

Source: Author's collection, 2021.

The same applies to the cliffs of Pipa, where smart panels could be installed on the Centre beach, updating information on the tide coefficient and the times of high and low tide. The calculation of this information could then be used to estimate a crossing time counter, indicating to pedestrians on the sand the time it takes to safely access the beaches of the Centre and Baía dos Golfinhos. Seemingly simple strategies can give tourists and locals a sense of organization and territorial control, avoiding risky actions.

4 FINAL CONSIDERATIONS: LAND MANAGEMENT AND SUSTAINABLE USE

It is becoming more evident that public managers and contemporary society have increased their search for nature-based tourist sites with high levels of scenic beauty, demanding the need to manage these spaces with a focus on sustainability. It is gradually becoming clear that favorable environmental conditions are also economically profitable, mainly when tourism is based on selling scenic beauty, as with the beaches of the Pipa District and Barra de Tabatinga.

However, these analyses still need more clarity regarding the role of territorial planning and management strategies in ensuring that areas of natural interest are sustainable in terms of their use and function for economic and social activities.

Therefore, to broaden the vision of Territorial Management, it is recommended that, in addition to the results and indications of mitigating measures of the Cliffs Project, actions should be considered that analyze the context of cliff areas from a regional perspective, especially when:

- cartography of the flows that make up the place, how their uses originate and are distributed;
- land use linked to the multifunctional destination of each development;
- contradictions between the normativity and the norms in force in the territory used;
- mapping the structures and materialities that influence uses, produce, or reflect sustainability risks;
- qualified listening to the different actors involved in local practices, understanding local strategies in addition to general analysis methodologies;
- expanding on the institutional analysis presented in the first report by mapping the systems of rules surrounding the available environmental resources (dunes, interdune lagoons, vegetation cover, geological and geomorphological heritage), analyzing the arrangements made by civil society groups, as well as their planning strategies;
- monitoring the form, function, structure, and occupation process of cliff areas;
- comparative analysis between the reality of this study and other similar ones, in Brazil or abroad, whether due to geomorphological characteristics (cliffs), the nature of the coastal feature (escarpments), coastal particularities or forms of management and occupation of the space; providing the case with a scientific condition for international discussion of this object of study;
- drawing up a synthesis model for Territorial Management (based on the collective surveys) to be followed by managers and players to organize actions in a sustainable and orderly manner in the context of coastal space that can guide governance at different scales.

To sum up, Territorial Management in environmental areas with the characteristics of this study should be given priority attention using an Analytical Cartography organized in a

network, capable of being a synthesis strategy for reading, interpreting, and making decisions for managers, investors, environmentalists, and scientists.

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