Article

An Endless Endeavor: The Evolution and Challenges of Multi-Level Coastal Governance in the Global South

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Abstract: We used Brazil as a Global South case study to analyze the evolution of the coastal governance in a young and still unstable democracy. Based on twenty-five years of documentation related to a federal-level actor interaction hub named Coastal Management Integration Group (GIGERCO) we explored the opportunity context for the transformation of the Brazilian coastal governance system using a Theory of Transformative Agency to identify five periods of evolution. The coastal governance system shifted from an exploitation to a conservation phase (periods 1 to 3), where an increasing number of actors were getting to know the system and each other's interests turned into a moment of higher stability and resistance to change. The mobilization of social capital and higher heterogeneity of actors allowed novel strategies to emerge, generating opportunities for structural changes from a conservation towards a release phase (period 4). We argue that the recent political changes in Brazil caused a rupture in such a flourishing coastal governance process (period 5), which is now at a critical juncture that may unfold into one of three envisioned alternative scenarios: conservative regime, a new integrated and ecosystem-based regime, or a remnant of past regime properties. Our paper informs coastal governance processes across the world, highlighting the dynamic nature of the interplay between alternative institutional entrepreneurship strategies, opportunity contexts, and innovations in governance systems.

Keywords: theory of transformative agency; Brazil; coastal zone

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1. Introduction

The current institutional system to regulate and govern the coastal zone has not kept pace with the extent of social-ecological changes and requires an adaptation to innovate and fit the transformation needed [1,2]. New forms of management and governance for marine and coastal regions that oppose conventional fragmented and sectoral-based management systems have been long discussed [3–8]. In addition, novel approaches are called to address the current changes and the complex problems introduced by the human-environment interactions in the coastal zone (CZ) [9]. Due to the magnitude of the issues and their characteristics (i.e., no definitive formulation, high level of uncertainty, and abrupt changes), innovative approaches must include policies and processes that will transform an entire institutional, environmental, and social system where they are embedded [10,11].

A reshaping and adaptive system is imperative to discuss the rapid large-scale changes [12–14], and a new scholarly field has emerged to deal with these complex problems. Sustainability science [15] is a solution-oriented field that among other topics deals with the agency of key individuals and/or organizations (the ability of actors to access resources such as information, group of people, or funds for new initiatives) that may advance on academic knowledge about ways of steering transformations in complex political regimes (e.g., [16]).

In the context of this field there is a need to characterize and discuss the complex challenge of coastal management, marked by unpredictable linkages across processes and system integration across all dimensions, to address the cross-scale interdependences of social-ecological systems [17,18]. Further, it is also relevant to identify sustainable development strategies that incorporate the insights from sustainability science to comprehensively inform decision-makers about issues such as more socially equitable and environmentally sustainable coastal development [19].

The international context has opened the arena to raise the discussion about the ocean sustainability where the Agenda 2030, through the Sustainable Development Goal 14 (Life Below Water), has established relevant indicators to keep ocean and coastal zones healthy. The United Nations has launched the Decade of Ocean Science for Sustainable Development (aka Ocean Decade) (2021–2030) to support efforts to reverse the ocean degradation trend and ensure ocean science can fully support countries in creating improved governance systems.

This context has fostered efforts in domestic arenas as well. In Brazil, for instance, the Science, Technology and Innovation Ministry (MCTI, in Portuguese) has started to build actions aligned with the Ocean Decade, and the Interministerial Commission of Sea Resources (CIRM, in Portuguese) has published the X Sectorial Plan for the Resources of the Sea (PSRM, in Portuguese) aiming at integrating and managing the Territorial Sea, the Exclusive Economic Zone (EEZ) and the Extended Continental Platform, which is called the Blue Amazon. Hence, there are opportunities to improve and discuss coastal management, as marine issues inextricably interact with the coastal zone.

Thus, the Brazilian Coastal Zone (CZ) is a case in point: (1) it is the home of one of the largest coastal zones in the world, encompassing about 10,800 km in length, sheltering 443 municipalities in 17 coastal states [20]; (2) has a well-developed institutional framework as ever since the promulgation of the Federal Constitution of 1988, which declared the coastal zone as National Patrimony [21], a decentralized multi-level management is under implementation, and a series of public policies were mandated to protect coastal ecosystems in different governmental areas (e.g., land use, sewage treatment); (3) the fragility and vulnerability of these transitional ecosystems are exacerbated due to inadequate governance [22], including a high degree of policy fragmentation [23], difficulty to interact with science bodies [24] and asymmetric power relations in decision-making [23]; and (4) the country is a young democracy that still faces significant institutional and political instability as other countries in the Global South [25,26], which affects the dynamics of ocean governance [27–30].

One way to advance on the knowledge to subsidy and support novel management and governance practices is to develop case studies that could illustrate how cross scales interdependences relationships and policies are built to face wicked problems. In Brazil, the central federal-level actor interaction hub on coastal governance sits at the Coastal Management Integration Group (GIGERCO). This is the level where the interplay of governance modes is possible, where autonomous, collaborative and hierarchical dynamics meet, and where opportunities were recently identified for steering transformations towards a more participatory, integrated, and ecosystem-based regime [23,31].

This paper engages with an emerging body of interdisciplinary research and practice that claims transformation is needed to foster systemic reform, to create and to imagine alternative futures within the field of resilience [32]. We use coastal zone governance in Brazil as a case study to advance on social-ecological transformation that results in novel and emergent system properties that are able to change critical systems feedbacks [33].

As the theoretical and conceptual framework has been debated over the past years [10,32,34], we provide a novel attempt to use empirically informed data to provide insights on alternative futures. Therefore, the description and the analysis of the evolution of coastal governance in Brazil and the discussion of its potential future opportunities may provide insights for social innovation associated with this governing instrument at the federal level and share reflections about coastal management transformation dynamics in a global

context. Yet, recognizing that any transformation may also include periods of disruption, opportunities may go back and forth generating an endless endeavor to build resilient systems.

The present paper will use Transformative Agency Theory (TTA) [2] framework as a heuristic approach for exploring detailed and updated empirical information regarding the opportunity context for the transformation of the Brazilian coastal governance system. This framework is based on a combination of two other theoretical approaches. Firstly, we refer to Holling's [35] "adaptive cycle," which encompasses four phases: exploitation, conservation, release, and reorganization in an infinite loop.

Secondly, we refer to Dorado's [36] conceptualization of three characteristic types of opportunity contexts: "opaque," "hazy," and "transparent." According to this perspective, opaque contexts have typically few dominant organizations (~conservation phase), are fully institutionalized with widespread and coherent rules, and thus do not provide for opportunities for novelty and change. Hazy contexts share few organizational or institutional forms and often arise following a major political crisis, transitions, or reforms (~release phase); hence they are unpredictable and tense to the point it may be not easy to leverage resources and imagination to envision an alternative system, build linkages, and find consensus on basic premises. Transparent contexts, in turn, share in common a multiplicity and diversity of loosely coupled organizational forms, with existing norms and beliefs that are not fully institutionalized but favors the development of new arrangements (~reorganization and exploitation phases).

Westley et al. [2] were the first to note the similarities of Holling's [35] framework with Dorado's [36] understanding of opportunity contexts' key drivers. Both approaches concern the ability of actors to access resources (e.g., institutional, knowledge, and human capital) for institutional innovation and to find points in the system in which there is enough room to introduce novelty [2].

We seek to advance the national level coastal governance system's analysis [23,31,37–40] by focusing on the insights provided by the investigation of the evolution of opportunity contexts at critical levels of the country's ocean governance regime: the CIRM, its subsystem GIGERCO and its main governing instrument, the Federal Action Plan for the Coastal Zone (PAF)—whose general aims are to help CIRM and the Ministry of Environment steer the implementation of Brazil's National Management Plan for the Coastal Zone. The theory by Westley et al. [2] has never been applied particularly in a national approach, being the first to our knowledge to apply the framework systematically and informed by empirical data.

The TTA lens was used in this paper to identify and describe periods and phases in the evolution of GIGERCO and discuss the potential to employ institutional entrepreneurship strategies to steer future transformations of Brazil's coastal governance towards a collaborative and ecosystem-based regime.

2. Materials and Method

2.1. Study Area

The Brazilian Blue Amazon accounts for a significant part of the Atlantic Ocean with a total area of 5.7 million km², including, Territorial Sea, the Exclusive Economic Zone (EEZ) and the Extended Continental Platform, encompassing three Large Marine Ecosystems and a plethora of deep-sea environments such as cold-water coral reef areas, submarine canyons and seamounts [41–43], and holding significant Ecologically or Biologically Significant Marine Areas (EBSAs) [44] (Figure 1).

Figure 1. Brazilian coastal zone and the Blue Amazon. Light blue is the territorial sea, sky blue is the economic and exclusive zone, and navy blue is the extended continental shelf.

The coastal zone encompasses highly biodiverse ecosystems such as mangroves, dunes, beaches, islands, rocky shores, bays, swamps, cliffs, estuaries, and coral reefs [45] along the 10,800 km of seashore. The existence of 443 municipalities in 17 coastal states [20] highlights the need for a multi-level coastal governance framework.

2.2. Data Collection and Analysis

Following the proposed TTA framework and the adaptive cycle (Table 1), we build on the analysis of official documents, federal legislation, norms, and meeting minutes to describe the evolution of GIGERCO considering meaningful changes in the diversity and multiplicity of organizational forms (homogeneity/heterogeneity) and the degree of institutionalization (stored/released capital) that can be noticed in the history of this problem-solving arena (Table 2). Therefore, the paper focuses on the content and scope of all four Federal Action Plans (PAFs) (MMA, 1998; 2005; 2014; 2017) and the 57 public report meeting minutes from all the GIGERCO meetings from 1997 to 2018. The PAFs were systematically assessed to inform a description of the periods in the evolution of the system and how they relate to the actor's strategies. The meeting minutes were analyzed to extract the number and type of participants, their position on specific topics, and major issues discussed. The norms, decrees, and applied legislation (1996–2021) were used to provide the political scenario and its influence in the opportunity context.

Westley et al. [2] acknowledge that the quality of the opportunity to achieve transformative change is based on actors' ability to access resources for new initiatives and use windows of opportunity in the political system. But they also recognize these are not static; hence they combine the two theoretical approaches outlined above to propose tailored institutional entrepreneurship strategies for each one of three identified characteristic transitional phases (Table 1), which are summarized as follows: (1) transparent to opaque contexts (exploitation to conservation): the ground for change should be prepared, and systemic exploration and building of novel ideas is undertaken; (2) opaque to hazy contexts (conservation to release): while the system is opening for change, is still stable and resources should be released to experiment with innovative ideas; (3) hazy to transparent contexts (release to reorganization): as the system starts to reorganize, the stimulation of emerging innovations and partnerships is needed. Very importantly, Westley et al. [2] also reviewed the literature for commonly used skills involved in successful ecosystem stewardship. Their TTA have thus advanced Olsson's et al. [10] and Plowman's et al. [5] search for a theoretical framework that is now able to help decipher the tailoring of a

variety of possible institutional entrepreneurship responses (strategies, skills, and types of agency) to each phase of change in a given social-ecological system. These responses may vary from stimulating the release of resources to encouraging new ideas and integrating ideas into existing institutional context and many others that knowledge carriers, brokers, innovators, and policy entrepreneurs may employ to advance and practice agency [3].

The following sections will introduce and explain the Brazilian multi-level coastal governance system. We then move into an analytical section where twenty-five years (1996–2021) of coastal governance is characterized in five different periods, highlighting the attributes from TTA used in their characterization. The last two sections discuss the main insights gained in the light of TTA and provide recommendations for more collaborative and inclusive coastal governance in Brazil.

Table 1. Definition of phases and institutional entrepreneurship strategies extracted from Westley et al. [2].

Phases of Change in Complex Adaptive Systems [35]	Definition
Exploitation	There is potential for the emergence of new institutions, with some degree of flexibility and predictability required for ambitious projects. The new norms and beliefs are not yet fully institutionalized but favor the development of new arrangements.
Conservation	Dominated by a few actors, homogeneity within actors and high stored capital—where actors may prefer stability and are inclined to resist change.
Release	Organizational forms are disaggregated, hence loosely connected to resources, hampering the ability to mobilize resources and the willingness to take risks necessary for social innovation. Share few organizational or institutional forms and often arise following a major political crisis, transitions or reforms.
Reorganization	New organizational forms and new linkages between actors emerge, creating opportunities for connecting ideas and resources strategically through various partnerships. Share in common a multiplicity and diversity of loosely coupled organizational forms.

Table 2. Definitions of the criteria (degree of institutionalization—potential; organizational forms—connectedness) and categories and type of information used to undertake the analysis of the governance of the Coastal Management Integration Group (GIGERCO) under the Theory of Transformative Action framework [2,35,36].

Dimensions of Change	Categories	Definition	Type of Information (Examples)
Degree of institutionalization (potential)	Stored Capital	A phase with stability and resistance to change. The accumulating potential could be from information, skills, networks of human relationships, and mutual trust.	GIGERCO report meetings neglecting pledges for more seats to environmental NGOs.
	Released Capital	Shocks or crisis can lead individuals to question existing institutional arrangements and may promote change in the system, releasing resources for novel strategies or new actions. Resources can be material, cognitive or social.	Normative and legislation changes, such as CIRM and GIGERCO extinction and GIGERCO recreation Ordinance.
Organizational forms (connectedness)	Homogeneity	Few actors. Loosely connected. Collaboration or patterns of conflict become so established and routine that the system becomes rigid/stable.	List of participants of GIGERCO meetings evidencing variety of goals proposed by different actors. GIGERCO meetings reports evidencing maintenance of issues Federal Action Plans indicating stability.
	Heterogeneity	Various actors with more access to information resources. When those actors connect networks, organizations and/or individuals. Change in the system routine.	List of participants of GIGERCO meetings evidencing variety of goals proposed by different actors. Federal Action Plans evidencing variety of goals proposed by different actors

3. Results

Brazil's approach to coastal and ocean governance has historically been under the leadership role of the Navy—from environmental and economic development through marine policy making and implementation strategies to ostensive control of national

sovereignty, security, and science and technology [46–48]. For instance, CIRM was designated in 1974 [49], and since then, it has been statutorily chaired by the Navy. By 2018 CIRM composition included 31 different organizations; however, since the shift from a progressive to a more conservative government after 2018's elections, CIRM was dissolved and re-created, now encompassing only 15 organizations [50]. For more than 40 years, CIRM has undergone admirable institutionalization to govern and steer arguably all national ocean-related institutional-building processes. CIRM is operationalized today by a high-level inter-ministerial plenary jointly responsible for overseeing 11 actions dealing with a variety of ocean issues within the X Sectoral Plan for the Resources of the Sea [51].

This entire ocean governance system has been feeling the impacts of higher-level governance, of which CIRM is a subsystem. Between 2015–2016, for instance, it was a critical period in Brazil. Brazil experienced economic hardship between 2015 and 2016, with GDP falling by more than 8% [26]. Governmental institutions were fragilized, and an impeachment process terminated the mandate of president Dilma Rousseff (Workers Party). This systemic crisis also affected how Brazil dealt with environmental governance in various matters, such as climate, oceans, fisheries, and many others [Refer to Viola and Gonçalves (2019) and the articles featured therein].

Triggered by the crisis and the favorable environment at the international level, at least two civil society platforms emerged, namely Ombudsperson of the Sea (2016) and the Brazilian Future Ocean Panel in 2015 (PainelMar). The former is a network of concerned citizens with expertise in coastal and ocean science and policy affairs, born at the People's Summit (Rio de Janeiro, 2012), a global civil society conference that took place during the Rio+20 conference in Rio de Janeiro in 2012. The latter emerged as a multi-actor platform that mobilizes and interlinks knowledge to enhance national ocean policy foresight and capacities for collaborative action [23].

In this context, Gerhardinger et al. [23] demonstrated that in 2018 the Brazilian national ocean governance regime was still largely “opaque” (stable in low responsiveness, centralized, fragmented/sectoral planning approach). But they also described progressive signs that it could slowly turn into “hazy” if small pockets of resources and ongoing support for novelty continued to occur. The application of TTA to the Brazilian opportunity context (opaque-to-hazy) suggested a series of tailored institutional strategies, cultural skills, and types of agency that, if promoted by concerned actors in the system, could tip the regime towards a more integrated and ecosystem-based regime. Ever since these highly theoretical and abstract recommendations were released, at least one actor (PainelMar) has attempted to undertake strategies partly inspired by these suggestions. However, as we will demonstrate next, political turmoil in the following years has urged a reassessment of the opportunity context for ocean governance transformation and raised concerns that those suggestions no longer held appropriate—an important issue this paper will explore.

Ever since January 2019, the election of a new populist and far-right conservative government has brought the strong winds of change to Brazil's coastal and ocean governance problem-domain. For instance, a series of administrative reform measures are being taken on Brazil's democratic structures that have been built ever since 1988's Constitution. Notably, we refer to Presidential's Decree 9.759/2019 [50], which extinguished the vast majority of decision-making or public participation forums, including reforms in the entire CIRM system. The president has publicly argued that Brazil's democracy needed, in his view, to be deconstructed before it could be reconstructed [50]. The fact that CIRM has been recreated by Decree 9.858/2019 [52] is indicative of the government's support to its overall mandate and related institutions. Yet, in 2020 CIRM has launched a revised version of PSRM, which develops several actions aimed at the coastal and ocean environment, to be executed in the period between 2020–2023. Although, the X PSRM [51] was launched in late 2020, it is still too early to grasp the extent that CIRM's former agendas and programs will be continued, strengthened or weakened, or perhaps even decommissioned. The new order is that all public forums should encompass no more than 15 seats. This atmosphere of high uncertainty dominates current debates around the future of coastal and ocean

governance, particularly concerning the dire need for up-taking ecosystem-based and more collaborative modes of governance.

3.1. Delving into Brazil's Integrated Coastal Zone Management Policies

The first attempt to establish a more integrated national ocean governance framework came from CIRM's initiative in 80s, which resulted in the National Policy on Marine Resources (PNRM, in Portuguese) (Decree 5.377/2005) [53].

Later, in 1988, the legal framework for coastal governance was established creating the National Coastal Management Plan (PNGC, in Portuguese) [54]. The law is regulated by Decree 5.300/2004 [55] and, to enable its implementation, a permanent forum for inter-institutional dialogue at the federal level was created in 1996—the Coastal Management Integration Group (GIGERCO), within the statutory umbrella framework of the CIRM but chaired by the Ministry of Environment.

The coastal management challenge in Brazil derives from the territorial political-administrative organization of the Brazilian state and from the multiplicity of institutions, processes, norms, and controls of different natures [56]. GIGERCO has been thought to act through the strategies of several actors. Each of them takes actions that help the system progress through different stages of innovation and transformation, in this case, coordinated and lead by the federal government (Environmental Ministry and Navy).

The government has been dealing mainly with two groups of agents with varying levels of influence in the coastal management process. One is linked to the different spheres of government, which establishes norms and develops actions to use the natural resources of the territory. The other is related to civil society, including the private sector—entrepreneurs and non-governmental organizations—and research institutions, which pursue to exert their influence over policy formation, arguing for using environmental resources to meet socio-economic demands and environmental protection.

GIGERCO is the highest-level stance of civil society participation in marine policy affairs and also includes representations of ministries, governmental regulatory agencies, public companies, Brazilian Association of State Environmental Entities (ABEMA), National Association of Municipal Entities of the Environment (ANAMMA), representatives of the 17 Brazilian coastal states (G-17), universities, and Public Prosecution Office, an aggregation of different mandates and interests related to the coastal zone (Table A1 in Appendix A—for all organizations that have been involved in the GIGERCO past 25 years).

As of early 2019, just before it was extinct, GIGERCO was formed by 31 constituent members. It has been recently re-launched with a different composition [57] with only 15 members, and then, in 2020 it was phased-down again.

The typologies used to define each group member were not based on their formal law constitution; hence, they are related to how they are represented. For instance, ANAMMA, ABEMA and G-17 group are legally constituted as a non-governmental legal entity; however, they are represented only by government public staff. Actor dynamics and strategies at GIGERCO are framed and guided by the Federal Action Plan for the Coastal Zone (PAF, in Portuguese), its main governing instrument, whose fourth edition ended in 2019.

GIGERCO is supposed to deal only with coastal matters (up to the limit of 12 nautical miles of the Brazilian Territorial Sea). Still, several issues pertaining to ocean governance beyond territorial waters were typically voiced out therein, for instance, discussions on marine spatial planning [58]. We assert that the nature of governing interactions held at GIGERCO is at the forefront of institutional innovations regarding new modes of collaborative coastal and ocean governance in Brazil.

In 1997, at the onset of GIGERCO, expectations were that it could align the current information for coastal management, establish a common language among actors, and allow joint evaluation and implementation of existing instruments [59]. The expectations were that it could provide vertical linkages between governmental levels and horizontal connections across states and cities to promote dialogue with civil society, partnerships, and articulations between states and private sectors [59]. The cross-level interplay with state and

municipal levels frequently occurs under National Association of Municipal Environmental Bodies (ANAMMA, in Portuguese) and Brazilian Association of State Environmental Entities (ABEMA, in Portuguese) representations, respectively. The horizontal interplay between the government representatives is coordinated by the Environmental Ministry and CIRM. Next, we describe and outline the different periods in twenty-five years of evolution of GIGERCO's institutions and related actor strategies based on the interpretation of four PAFs, meetings minutes from 1997–2018, policy and norms documents from 1996 to current dates and the analytical lenses considering the criteria based on TTA (the interplay between homogeneity/heterogeneity and stored/released capital and the key drivers of opportunity contexts to promote transformation).

3.2. *The Evolution of Twenty-Five Years of Coastal Management*

The documental analysis from GIGERCO pointed out five periods related to coastal management evolution in Brazil (Figure 2), which are described below.

- Period 1—the beginning of a new Era for coastal management (1996–2000)

GIGERCO was created in 1996 [60] but no activities were undertaken until the first meeting at 1997 [61]. In September 1998, discussions about PAF I were advanced after presenting the outcomes of an earlier workshop [62] to find a basis for action on coastal management in Brazil. The legal departure point was the National Environment Policy [63] and the National Policy for Resources of the Sea [53]. The Federal Action Plan was set as an instrument to foster actions to reorient the Coastal Zone occupation from the main development axes (tourism, transportation, urbanization, and industrialization).

The main topics discussed along PAF I were related to ports (e.g., development of environmental agendas in ports), municipal coastal zone management actions, contingency plans against oil spills, and tourism development in the coastal zone.

PAF I was in place from 1998 to 2005 (7 years). Besides all the actions it had proposed, it stated clearly that the plan had at least the ambition and the desire to be conducted in a very participatory way, including all the ocean-related segments across different scales and levels ([59], p. 34).

The 1998 PAF was structured in four programs and thirty-two lines of action, each with its principal leader, co-leader, and priority direct partners. The Ministry of Environment was carrying much of the burden as the principal leader of twelve such actions and another five as co-leader. The main joint activities were made through the Environmental Ministry and the Secretariat of Patrimony of the Union (SPU, in Portuguese), IBAMA, and the Brazilian Navy. Besides the governmental representatives, a non-governmental environmental actor was present only in one meeting (September 1998) and with no further commitment outlined in PAF I, which reflects GIGERCO power dynamics with dominance of a few governmental organizations.

This period is the beginning of shaping a new, more interactive identity for coastal management in Brazil. Ten years after the Federal Constitution had guaranteed the National Heritage for the coastal zone, this was the first step to create new organizational forms (framework and enabling coastal management legislation), build GIGERCO's social capital within CIRM, and start building knowledge to engage in pressing governance issues. The GIGERCO prepared the ground for change and novel ideas could emerge under this new forum, integrating various sectors and establishing a collective plan.

Despite the initial progress, GIGERCO did not yet meet the ambitious goals established at the PNGC. It was represented mostly by government entities, with CONAMA attending one meeting as a member and scientific community attending two meetings as observers. Yet, the actions proposed at the PAF I were all proposed and developed by government entities with no participation of any civil society entities (e.g., environmental NGOs, trade confederations, and academia).

Figure 2. The evolution of coastal governance including the identification of periods at the national level within the Coastal Management Integration Group (GIGERCO). The information was depicted from meeting minutes, applied legislation, and Federal Action Plans from 1996–2021. PAFs: Coastal Zone Federal Action Plans. ENCOGERCO: National Coastal Management Meeting.

This period is then associated to the exploitation phase (Figure 3), where actors are building the arena for novel ideas, taking advantage of the released resources with the institution created (i.e., GIGERCO), leveraging economic, social, and ecological resources to support best innovative ideas, and integrating these new fora into existing institutional context. In the exploitation phase the degree of connectedness is still low, with diffuse elements loosely connected, and greatly affected by outside variability. The potential has been released to enable change, like getting to know members and put together a collective agenda to work on coastal management domain.

Figure 3. Model of agency, context, and problem domain innovation, and the shift to a new configuration of the Brazilian Coastal Governance system (adapted from Westley et al. [2]). Periods 1 to 3 refer to transparent to opaque contexts (exploitation to conservation): the ground for change should be prepared, and a systemic exploration and building of novel ideas undertaken; Period 4 represents a transition from opaque to hazy contexts (conservation to release): while the system is opening for change, resources should be released to experiment with innovative ideas; Period 5 and Scenarios (A; B; C) are associated to a hazy to transparent context (release to reorganization to exploitation): as the system starts to reorganize, the stimulation of emerging innovations and partnerships is needed.

At the exploitation phase, we notice the members of GIGERCO found common ground (e.g., PAF) and appeared to be prepared to exchange information and even resources to solve any question related to the coastal management. From that point on, the stakeholder system can move forward to a more formal, consolidated organizational form towards a conservation phase or getting ready for a conservation phase. It is argued here that Period 1 is characterized as an exploratory *momentum*, in what Westley et al. [2] would call a time to build resilience in a new system—a heterogeneous system where multiple organizations are presented although not yet tightly connected and many different beliefs still coexist—where agents develop motivation and values for management. As some of these disappear and others become more connected, the system is going from transparent to opaque ([2], p. 6) (Figure 3). This does not differ from the previous assessment made by Asmus et al. [7] from 1988 to 2001. They had classified the period from 1997–2001 as the

implementation step when it was the momentum GIGERCO members started to plan and implement PAF I.

- Period 2: Expansion of organizational forms and resistance to changes (2001–2012)

The period 2 presents characteristics of heterogeneity, and still uses the benefits of the release of resources from the GIGERCO establishment. A significant initiative in this period 2 was the realization of four National Coastal Management Encounters (ENCOGERCOs: 2002, 2004, 2006, 2009)—events organized and executed by civil society in partnership with the government aiming at to discussing and reflecting upon the coastal management process.

Also, the Macro-diagnostic of the Brazilian Coastal and Marine Zone was revised and published [64]. In 1996, as a result of an assessment of Coastal Management in the country started in 1988, the first version of the Coastal Zone Macro-diagnostic was published [65]. The Macro-diagnostic gathers information, on a national scale, about the physical-natural and socioeconomic characteristics of the coastal zone, in order to guide actions for the preservation and conservation of natural and cultural heritage. It also integrates vision and knowledge from the scientific community and government entities. Both initiatives reveal an expansion of organizational forms.

However, the period 2 also shows sign of going from exploitation to conservation, where the formal system indicates a resistance to changes. This period was also marked by neglecting seats to environmental NGOs. In 2001, the Brazilian Coastal Management Agency (an environmental NGO) was created to promote the convergence of actions for the integrated environmental management of the coastal and marine zone. Even after years of persisting efforts and meaningful activities, its requests to have a seat at GIGERCO were not accepted, and hence it acted as observers in five meetings (three in 2005, one in 2007 and 2009), with no right to vote.

In 2004, the final event's plenary pledged for an increase in civil society participation at GIGERCO. The request later faced strong opposition by the Ministry of Transport representatives at GIGERCO, which considered that civil society could hamper the work of the GIGERCO—which should be a predominantly governmental organization (CIRM 2005). The insistence of civil society actors at CONAMA to increase civil society representation at GIGERCO triggered discussions about formal bylaws and norms for its operation, rules for deliberation, and inclusion criteria for new members. This was an embryonic movement towards the debate over the GIGERCO bylaws, which were started back in 1998 (Draft Bylaws; Figure 2). From 2004 to 2005 every meeting discussed the bylaws, and there was no consensus on the proposed content, especially in what it dealt with the voting rights and new members. In May 2007, the bylaws were approved by consensus, even with NGOs claiming for more representation, which was once again denied ([66], p. 6).

This debate demonstrated the demand to increase GIGERCO institutionalization and a push to increase the heterogeneity of actors, thus more balanced power dynamics to promote the decentralization of coastal management in Brazil.

In April 2011, again, the Brazilian Coastal Management Agency submitted a formal request for a seat at GIGERCO, arguing that they should be seen as more likely as a network and not as an NGO. Still, their pledge was denied by GIGERCO members who reiterated that only one seat should be available to civil society and that such representation should be nominated by environmental NGOs holding an elected seat at CONAMA. Ever since, other governmental institutions or even private or resource users (e.g., Industry confederations) requested seats, which were granted through immediate consensus. In this period, social movements, academia, traditional communities, local NGOs, and other actors could only attend if invited as observers with no voting rights.

While during the past ten years environmental NGOs representatives were vocal and active in GIGERCO meetings, the space for proposing and engaging directly on coastal management was very restricted, as there was no PAF goal proposed by CONAMA representation or engaged in partnerships at PAF I. As the system evolves towards the

conservation phase (Period 3), connectivity among the members intensifies, and new entrants find it increasingly difficult to enter existing initiatives.

In August 2011, the Scientific Community seat was granted as a request from the V Brazilian Oceanographic Symposium, and from 2012 the academia representatives have attended the meetings—together with the industry, trade, and transport Confederations, evidencing more heterogeneity in the system. During the slow sequence from exploitation to conservation, connectedness and stability increased and capital is slowly accumulated, as it enters in a phase represented by higher homogeneity and stability [67].

- Period 3—Homogeneity and Stability at conservation phase (2013–2016)

While in the Period 2 heterogeneity was increasing (e.g., new members in academia and confederations) and the resources were released outside the GIGERCO, through the ENCOGERCOs with more civil society participation, the sequence, the Period 3, revealed more resistance to challenge and changes, with higher stored capital and a homogeneity of issues and actors. This represents an unfavorable opportunity context for the introduction of novelty.

No other actor was admitted, and the member ENGO were almost absent in this period. This is a characteristic of a domain in the late exploitation or early conservation phase. Simultaneously, it created an organizational crisis in the agency. Even though civil society actors at CONAMA had indicated a representative to seat at GIGERCO, it was almost absent from meetings from April 2012 to November 2016 (NGOs attended only 4/17 plenary sessions), and were not involved in substantial discussions and therefore cannot be considered meaningful agents at GIGERCO in this period.

A PAF II Review Workshop was held in 2014, including 36 participants from GIGERCO who outlined the “conflicts of the use of resources and territory” as a major coastal management concern with the following causes: (i) impairment of coastal and estuarine environmental quality; (ii) governance: absence/deficiency of institutional frameworks to elaborate and implement actions; (iii) lack of hierarchy and prioritization of activities. The next PAF III followed with 16 proposed actions [68], which sought to tackle, according to the participant’s view, “the most pressing problems affecting the Coastal Zone” [69]. Shared responsibility for actions was sought whenever possible, aiming at the involvement of all GIGERCO members, which in the PAF III and for this period, were only between governmental organizations and the scientific community. The process of being more participatory and engaging more actors still lacks an appropriate organizational form. Yet, attempts to engage actors and pursue new organizational structures failed, as only 1/3 of participants coordinated actions at PAF III.

In 2014, in the 49° session of GIGERCO, members decided to revise the bylaws (approved at 30° session), which had never been publicized, and created a new working group. Although some members were not in favor, as GIGERCO could operate within CIRM bylaws (e.g., MME and CIRM), they agreed to revise since GIGERCO acts under different circumstances and it does include non-governmental members. At the 54° GIGERCO (June 2016) meeting, the bylaws were approved on its new version. And, according to the new and revised GIGERCO bylaws “the inclusion of a new body or entity as a member of the GIGERCO would be subjected to the submission of a formal proposal by the applicant to the Collegiate Coordinator indicating the contribution or competence that would justify its inclusion.” Although approved, bylaws were only published two years later (2018), evidencing how much resistance to improve transparency and participation the members had. It took 13 years to publish and accept the bylaws (2005–2018).

Period 3 is then marked by stability in the conservation phase, with no big changes or novel ideas or even new actors engaging in the process. The degree of connectedness is high evidencing a major control of external influence. In the opaque opportunity contexts, innovation is very unlikely to occur since they are by definition considered “mature system” [2].

- Period 4—Stakeholder's engagement at GIGERCO (2017–2018)

The Period 4 goes from opaque to hazy, and it includes disturbances to stimulate the release of resources and lower the resilience of the dominant regime. It is considered a late conservation and early release phase. The new approved bylaw was a small pocket of energy released here, increasing the transparency and the possibility of more engagement from others actors. As a result, from August 2017 to November 2018, environmental NGOs had resumed its participation at GIGERCO meetings, under a novel knowledge network-based organizational form (a “collective mandate”), proposed by several networks (Ombudsperson of the Sea, the Marine Conservation and Fishing Network, Brazilian Forum of Organizations and Social Movements (FBOMS), Sea Forum, the Brazilian Network of Artisanal Fishing Networks (TeiaPesca), Memories of the Sea group, and the Brazilian Panel for the Future of Oceans (PanelMar)), hosted by a formally registered NGO seating at CONAMA. This change started after a long period of absence from environmental NGOs' representation at GIGERCO meetings. Through this new model, the environmental NGOs representative proposed and assumed responsibility for two of the eighteen actions of the PAF IV, and this was the very first time an action from environmental NGOs was included at PAF.

The PAF IV included actions from a diverse array of actors, such as scientific community, public prosecutor association, networks, ANAMMA, ABEMA, G17 and many others. This period brought resource mobilization and released capital, opening up to innovative forms of organization to improve GIGERCO engaging more actors and increasing its heterogeneity. In the end, 18 actions were proposed. The new PAF IV framework was also more explicitly related to the United Nation's Sustainable Development Goals framework to assist with the integration of activities with government commitments at the global level.

The period felt short, and as intensive as this period was in terms of proposed actions within PAF IV, the heterogeneity of actors and actions were phased down, as early 2019, under new administration, institutional and political changes unable the system to go forward with the meetings and PAF revisions. It was an abrupt disruption. The system was opened for change and novel ideas, and extinguishing the institutional spaces for coastal governance caused a major disturbance, entering into a release phase, full of uncertainties in the stakeholders on how to proceed so far.

- Period 5—GIGERCO at a critical juncture (2019–2021)

In 2019, Brazil entered a challenging time for its democratic institutions and is now dealing with deep reforms proposed by ultra-conservative forces elected to the state's legislative and executive spheres. At the beginning of the presidential mandate, many participatory commissions were phased-out, diminishing drastically the overall level of civil society participation in public administration at the highest governance levels [50], with direct implications to the coastal and ocean governance systems in place.

CIRM and GIGERCO were extinguished on paper [50], bringing an unstable environment, where the members did not know the next steps. It was a disruption in the system. And, even when these forums were (re)designated, it is still unclear how their new organizational forms will evolve. The number of commission and group members was reduced to comply with new limitations imposed (e.g., 15 seats only) by the actual government [57], and no plan or meeting happened since then. GIGERCO, for instance, would reconvene in 2020; however, so far, no meeting has happened, and hence the final implementation period of PAF IV still was at risk of not being monitored and evaluated regarding its implementation effectiveness; and thus, also risking not generating learning to guide improvements in any instruments that may be used to steer actor strategies in the future of the system.

In summary, after Decree 9.759/2019 [50], which extinguished most federal collegiate bodies, CIRM was reinstated by Decree 9.858/2019 [52], which made it possible to publish Ordinance 236/2019 [70], recreating the collegiate bodies of CIRM, including GIGERCO. However, on July, 2020, Ordinance 226/2020 [71] was published, which, among others, revoked Ordi-

nance 236/2019 [70], and, consequently, Ordinance 144/2019 [57], which had disciplined the new operating structure of GIGERCO. A series of other ordinances were published, (re)creating the executive committees and technical groups that make up the CIRM on a case-by-case basis. GI-GERCO, however, was not among them. Therefore, current, GIGERCO remains non-operant and non-existent.

This also risks the incipient efforts to form a cross-network mandate under implementation in the past years. Also, a new nomination procedure has been set for environmental NGOs at CONAMA that now are elected based on a lottery system and a mandate shortened to one year [72,73]. While losing formal representation at GIGERCO creates a problem in civil society participation at federal-level coastal governance, the civil society ‘collective mandate’ has continued working as a team, indicating that it can foster a “shadow network” (sensu [51,74]) of individuals and organizations that remain operational even after governmental suppression.

Not only the “collective mandate,” but other groups and actors are yet mobilized and engendering the necessary efforts to foster coastal management actions, such as the Scientific Community through the “Program for Human Resources Training in Marine Sciences” (PPG-Mar, in Portuguese), which is seeking to strengthen the training of qualified human resources to promote knowledge about the components, processes and resources of the marine and coastal environments, operating under CIRM program [51]. Also, there is a committee mobilized and organizing a new ENCOGERCO in 2021, after three years of the past one. Those mobilization in the release phase will support the reorganization phase once the GIGERCO activities are resumed, if so. This may increase heterogeneity and encourage the proliferation of ideas and the recombination of resources in new and novel forms, for instance building networks or implementing collective actions [2].

As the political atmosphere was and still is uncertain, institutions may lose credibility or collapse, making room for novelty but leading to unpredictability about the future. Organizational forms will be fragmented and loosely connected to resources, hampering the ability to mobilize resources and the willingness to take risks necessary for social innovation [2].

This is a critical juncture period where, after a major disruption in the system, there are different pathways to follow. Next, we offer our insights, based on TTA, on what may be unfolding in different scenarios (A; B; C)—and affecting the endless endeavor of actors in the system in their attempt at transformation.

4. An Endless Endeavor and an Opportunity for Future Transformation

While previous research on coastal management in Brazil has pointed to the major challenges and opportunities to coastal governance implementation and regime transformation in the past [23,37–39,75,76], they did not consider the critical juncture now facing the legacy of federal level democratic coastal governance in the country. We outline below some possible ways forward to help institutional entrepreneurs navigate a muddled opportunity context.

Our paper investigated the current political context and described and explored the evolution of the fragmented and sectoral-based national coastal governance system in Brazil in the past twenty-five years. We used the adaptive cycle as a heuristic to understand change and resilience in a complex system [67] in the past twenty-five years (1996–2021), [2].

As a common goal, GIGERCO members have been statutorily addressing the existing lack of integration between policies and actions through dialogue with diverse stakeholders. The system has evolved during the past twenty-five years and up to late 2018, had been able to maintain its institutional memory. To a certain extent, it is noticeable that specific gains may not hold longer to the next period, depending on the trajectory of the system given and the extent to which it will build upon the available institutional memory and outcomes of the new elections leadership.

The system is currently facing unprecedented challenges. Within political instability and actions discontinuity, the coastal management in the federal level has been inactive

since PAF implementation was forcefully terminated. The Environmental Ministry, which is the organization that coordinates GIGERCO (Figure 2), is going through a period where there is less room for dialogue with civil society actors, less openness towards scientific debate and political dissent, and has ever since enacted several legislative acts aimed at weakening environmental protection [77].

The future is uncertain. However, most CIRM technical groups were re-created and are operating to some extent, except GIGERCO, which may be a demonstration of lack of interest. It may be too early to draw any conclusion into how GIGERCO will operate in the upcoming years, and if it will be reestablished after all [73]. We now predict three possible alternative futures, presented as hypothetical scenarios A, B, and C (Figure 3).

Scenario A would be characterized by the resilience of GIGERCO, if it retains its operation under the same culture and same institutional memory and evolutionary pathway. After the current period of release/reorganization, the system would go back to exploitation, with structuration aiming the conservation of an identity very similar or equal to the one it had reached after 25 years. The system resumes operation, and organizations (perhaps even individuals representing them) are back to the system. There is a large possibility that, in this case, GIGERCO representatives would know each other and therefore understand how the system works and how it can get back to the track of previous performance levels; past representatives would share their memories of the process with new ones and proper evaluation of PAF IV's implementation effectiveness could be seen as the main leverage point for rebooting/restarting the system.

A second scenario (B) would be the transformation of the system towards a more ecosystem-based management regime, considering that the resource release would lead to old organizations losing their dominance and new ones opening to social learning, creating, and developing a radically new governing system identity and operational characteristics as the system becomes more transparent and starts a new front loop (exploitation) of a different adaptive cycle [36]. Moreover, we highlight the fact that CIRM has proven to be a very resilient system. This situation favors path-dependent factors such as historical managerial cultures in ocean governance remaining dominant (e.g., largely fragmented, and sectoral-based approaches).

The above considerations take us to Scenario C with complete disruption—resetting of the system with new design features, entirely new representatives, new regimental rules and ideological identities, followed by complete disregard of GIGERCO's institutional memory. It would still operate within the CIRM system, hence perpetuating the broader, fragmented and sectorized Brazilian ocean governance regime with whom it critically interplays. The PNGC and the legal system would remain the same, however, the GIGERCO subsystem would enter the exploitation to conservation phases in an entirely new adaptive cycle.

If these new scenarios are to be unfolded, it will depend on the new organization, on the institutional entrepreneurs and understandings that will emerge to make the opportunity context more transparent. Regarding the future of GIGERCO, we still have more questions than answers. As GIGERCO moves from the release phase to the reorganization and exploitation phases, new institutions may appear. However, they will still be in the process of establishing themselves as an endless endeavor so that there should be both flexibility and predictability required for novel projects.

Institutional entrepreneurs in scenario A would soon see themselves navigating an opaque-to-hazy (or conservation-to-release) phase of an adaptive cycle again, where structural resemblance to the previous loop was apparent—hence the recommendations by Gerhardinger and collaborators [23] would still hold valid. Overall, they would still need to lower the resilience of the dominant regime by introducing novelty through a series of tailored strategies, employed skills, and types of agency. For instance, under these circumstances, institutional entrepreneurs will require continued mobilization of resources and support for advancing more inclusive byelaws of the diversity of civil society organizations' interests in federal-level coastal governance, and integrating them into

incumbent coastal-ocean governance bureaucracies at large. GIGERCO participants should seek a candid collective evaluation process of PAF IV implementation as a departing point. These actors would need to continuously support storage of capital (e.g., network and informational capacities) until novel opportunities arise for GIGERCO constituents to influence the transformation of the Brazilian ocean governance system at large towards an ecosystem-based regime.

We envision at least two other somewhat similar possible scenarios (B and C) where institutional entrepreneurs will navigate transformation towards alternative adaptive cycles (hazy-to-transparent/release-to-organization-to-exploitation), but hold radically different inner features and identities.

In scenario B the institutional entrepreneur would need to draw upon the accumulated resources—i.e., experience and informational and network capacities concerning ecosystem-based management implementation at subnational levels—to leverage their recombination into a nationally cohesive new pathway that may eventually emerge at the Brazilian ocean governance regime at large. Encouraging the proliferation of ideas and the recombination of resources in new and novel forms by, e.g., building networks, making room for emergent self-organization. In establishing the primacy of their innovation, a newly established institutional context towards EBM is possible. This scenario is highly improbable in the short-term horizon, as it would depend on contextual conditions in the country such as election, political stability, social participation, and many others.

We expect that institutional entrepreneurs in scenario C will share ultra-right conservative mindsets, but while they would theoretically also be navigating a hazy-to-transparent into another inherently different adaptive cycle, it will build upon already dominant features of the incumbent regime (e.g., fragmented, top-down, sector-based). It is not our intention here to expand on what strategies these actors may engage with, but to alert about the serious damage some aspects of the far-right and ultraconservative may impinge on Brazil's democracy, social equity, and coastal-marine environmental sustainability. The *modus operandi* is clearly one of discredit in science, mis and disinformation and ostensive attacks on the rights of minorities, to name a few possible elements of Scenario C. Nevertheless, we argue that under this scenario, those other institutional entrepreneurs pursuing transformations towards an EBM regime will also need to pursue institutional strategies, employ skills and types of agencies recommended to Scenario A—to lower the resilience of the dominant regime.

GIGERCO is the arena where decisions are shaped and where the actors have space to promote the transformative agency towards coastal management innovation under the EBM approach. The new membership structure has changed and the bylaws are now published, and it has now the opportunity to commit to the challenges of coastal management. In parallel or operating through the shadow [74] there are also individuals, networks, and organizations that remained engaged and are collectively reflecting upon the coastal management process to navigate through social innovation and promote a shift in the system to a more flexible and integrated approach. For instance, the collective mandate team under the Brazilian Ocean Horizon program continues collaborating and mobilizing actors from different sectors (academy, NGOs, social movements, activists, and others) through association to an informal “network-of-networks” PainelMar (Brazilian Future Ocean Panel) [78]. This type of initiative may trigger innovation within the governance system in Brazil, and eventually contribute with others, forcing the system to tip from conservation to release, building capacity and proposing solutions and alternatives for the future transformation. In order to have any of these scenarios in place, GIGERCO has to be minimally resumed or rebooted (Scenario A), hopefully not reset (Scenario C).

Achieving transformation is not an entirely random process; it is shaped both by the existing elements (actors and policies) and their interactions, i.e., interplay of political context and orientation, agency by actors within the system and the leadership models pursuing change in the system in various ways. As highlighted in the literature and corroborated here, actors do not control the course of a transformation; rather, they can only steer

it somewhat toward their goals and influence the trajectory of the transformation process (Westley et al. [2]). The hope for social innovation in a complex system sometimes seems an endless endeavor compared to dominant cultural norms (i.e., opaque, conservative with store capital). We argue for the combination of deliberate planning and experimentation, preparation, creativity, and novel approaches, as means of triggering transformations of significant consequences for the broader social-ecological system. Yet, it is relevant to notice that pursuing social innovation helps confront established path-dependencies embedded within the system. Thus, “bricolage” may be a way forward in some processes where you combine or recombine existing rules and elements in new puzzles [10], respecting mostly the contextual conditions to avoid the so-called panaceas [79] and to pursue a just sustainability [19].

5. Conclusions

This paper reports on the first study case to our knowledge that systematically applies TTA to investigate ocean policy systems, and particularly at a national (or multi-level) approach. We show that although alternative scenarios for the evolution in the ocean governance system can be envisioned, the country’s institutional entrepreneurs should remain committed with the same basic set of strategies, skills and agency types that have been suggested before the on-going turmoil and crisis in the Brazilian democracy. This is a critically important aspect for change agents willing to prepare themselves for navigating transformations in ocean policy arenas and may also be appropriate to other countries facing similar surges of authoritarian leadership. We therefore contribute in advancing TTA by highlighting the diversity of interpretations of the linkages between strategy, opportunity context, and innovation phase by exploring different scenarios associated to a system operating at a critical juncture.

As we argue here, based on the Brazilian case study, to take advantage of the opportunity context, it is relevant to understand how the institutions and actors may deal with social innovation within the conventional coastal management system, and then find entry points for innovative mechanisms that may promote system resilience, enabling the system to adapt or transform in the process. Implementing coastal management policies is a challenge in different countries, especially in the Global South, where democracy still faces great challenges. GIGERCO and coastal management in Brazil, broadly speaking, are an endless endeavor as a dynamic social-ecological system subjected to abrupt changes, disturbances that stimulate the release or the storage of resources and modulate the system characteristics in an infinite loop.

It would be beneficial if future studies could look into sub-level of the governance systems (e.g., local and/or municipal, regional levels) and focus on the institutional entrepreneur and the strategies employed to link local innovation to national policies and economic and social structures to evaluate how cross-level dynamics can foster or hamper social innovation in support of socially equitable and environmentally sustainable coastal and ocean development.

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Appendix A

Table A1. Acronyms, names, and mandate of organizations included in the Coastal Management Integration Group (GIGERCO) composition by 2018 and from 2019 onwards after statutory reforms. Source: Environmental Ministry website (2018).

Organizations Acronym	Full Name	Mandate	By 2018	From 2019
SECIRM	Secretary of the Interministerial Commission for Sea Resources	Supports Navy to coordinate matters relating to the achievement of the National Policy for the Resources of the Sea (PNRM).	X	X
MMA	Environmental Ministry	Responsible for implementing the National Policy of Environmental and its deployments, such as the Coastal Management Plan, National System for Protected Areas, and others related to the coast and maritime zones.	X	X
MME	Energy and Mining Ministry	Oversees the gas and oil operation, as well as mining activities in the coastal areas.	X	X
ANAMMA	National Association of Municipalities of Environment	Civil entity, non-profit nor partisan, representative of the municipal government in the environmental area, with the objective of strengthening the Municipal Environment Systems to implement environmental policies, such as the municipal coastal management plans.	X	X

Table A1. Cont.

Organizations Acronym	Full Name	Mandate	By 2018	From 2019
ABEMA/G17	Brazilian Association of State Environmental Entities/Coastal State Integration Subgroup	Civil entity, non-profit nor partisan, representative of the state government in the environmental area, with the objective of strengthening the State Environment Systems to implement environmental policies, such as the state coastal management plans. And G-17 represents the 17 Brazilian coastal states.	X	X
IBAMA	Brazilian Institute of the Environment and Renewable Natural Resources	It is the executive body responsible for the implementation of the National Environmental Policy and carries out various activities for enforcement and compliance of coastal and marine regulations, such as licensing.	X	X
MAPA	Ministry of Agriculture, Livestock and Supply	It is responsible for the management of public policies to stimulate agriculture and livestock. It houses the Fisheries Secretary, and hence it has the role to promote fisheries management.		
MPF	Federal Prosecution Office	The MPF acts in federal cases, regulated by the Constitution and federal laws, whenever the issue involves public interest. For coastal areas, it works whenever an action to implement certain policies is requested.	X	X
Economy Ministry/SPU	Economy Ministry/Union Heritage Secretariat	It oversees budget planning. The Union Heritage Secretary authorizes the occupation of federal public real estate, establishing guidelines for free use, promotion, donation, or assignment when there is public interest. It is also responsible for the management of coastal territory and in control of the use of common goods of the people, among other duties.	X	X
Navy	Navy	Develops a comprehensive monitoring and control strategy for the protection of the coastal zone, as well as strengthens knowledge of the maritime environment and position available operational means to respond to any crises or emergencies in the Brazilian territorial sea.	X	X

Table A1. Cont.

Organizations Acronym	Full Name	Mandate	By 2018	From 2019
MCTIC/MCTI	Ministry of Science, Technology, Innovations and Communications (by 2018)/Ministry of Science, Technology and Innovations (from 2019)	It collaborates with knowledge production and supports a variety of ocean observation systems for collection, quality control, operational distribution of oceanographic data, and oceanographic and climatological monitoring in the Southern and Tropical Atlantic Ocean.	X	X
MI	Infrastructure Ministry	It is responsible for national transit and transport policies, which include ports and marinas.		
MDR	Regional Development Ministry	It has the role of implementing policies regarding sewage, coast protection, housing, and a variety of urban services.	X	
MTur	Tourism Ministry	It seeks to develop tourism as a self-sustaining economic activity in generating jobs and income.	X	
Civil Society/CONAMA	Civil Society—National Council of Environment	CONAMA may indicate environmental NGOs to occupy their seat on commissions, such as GIGERCO, and it normally mandates shifts depending on who is represented here.	X	X
Universities/PPGMAR	Universities	PPGMAR is a program to train human resources for the study of the sea and coast. It includes a variety of disciplines, and they are responsible for indicating the representatives of higher education and research institutions at GIGERCO.	X	X

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