
Scenario of integrated coastal zone management in Pará-Brazil and Beira-Mozambique

Escenario de gestión integrada de la zona costera en Pará-Brasil y Beira-Mozambique

Cenário da gestão integrada da zona costeira no Pará-Brasil e Beira-Mozambique

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Abstract

In the current context of climate change, coastal environments are seen as places of greater risk and socio-environmental vulnerability, especially with the recurrence of extreme events, drawing attention to planning and management policies for these areas. The aim of this article was to assess the state of the art of coastal management in the state of Pará (Brazil) and in the province of Beira (Mozambique), seeking to identify the progress and continuity of action on environmental issues in the coastal zone of both territorial units. The review and analysis of articles and institutional documents identified that, in both Pará and Beira, integrated coastal management must involve local communities in order for public policies to be effective, which is still a challenge.

Keywords: coastal zone; integrated management; Pará; Beira.

Resumen

En el contexto actual de cambio climático, los ambientes costeros son vistos como lugares de mayor riesgo y vulnerabilidad socioambiental, especialmente con la recurrencia de eventos extremos, llamando la atención sobre las políticas de planificación y gestión de estas áreas. El objetivo de este artículo fue evaluar el estado del arte de la gestión costera en el estado de Pará (Brasil) y en la provincia de Beira (Mozambique), buscando identificar los avances y la continuidad de las acciones en materia ambiental en la zona costera de ambas unidades territoriales. La

revisión y el análisis de artículos y documentos institucionales revelaron que la gestión costera integrada, tanto en Pará como en Beira, deberá implicar a las comunidades locales para que las políticas públicas sean eficaces.

Palabras clave: zona costera; gestión integrada; Pará; Beira.

Resumo

No atual contexto das mudanças climáticas, observa-se que os ambientes costeiros se apresentam como locais de maior risco e vulnerabilidade socioambiental, principalmente, com a recorrência de eventos extremos, chamando a atenção para políticas de planejamento e gestão dessas áreas. Este artigo objetivou avaliar o estado da arte da gestão costeira no Estado do Pará (Brasil) e na província de Beira (Moçambique), buscando identificar os avanços e permanências nas ações sobre as questões ambientais na zona costeira de ambas as unidades territoriais. Na revisão e análise de artigos e documentos institucionais identificou-se que, tanto no Pará quanto na Beira, a gestão costeira integrada, deverá envolver as comunidades locais para efetividade das políticas públicas, o que ainda se coloca como um desafio.

Palavras-chave: zona costeira; gestão integrada; Pará; Beira.

Introduction

The coastal zone is considered one of the most dynamic environments on the planet, changing over time and space. This region has physical characteristics and ecological functions, and is an area naturally subject to continuous morphodynamic changes, shaped by natural and anthropic processes (SILVA et al., 2004). These environments are subject to a large number of factors of natural origin, intrinsically interconnected, and others caused by anthropic interventions, related to the forms of their occupation and use. On the other hand, discussions about sea level rise and the influences on coastal regions, mainly in the modification of sediment flows and changes in erosion and sedimentation processes, are on the agenda and require efficient management instruments (Neves; Muehe, 2008; Szlafsztein, 2009). In the

context of climate and environmental changes, these areas present the greatest socio-environmental risk in the world, mainly due to the occurrence of extreme events and rising sea levels (Kron, 2008).

From a socioeconomic point of view, coastal territories still have communities that maintain their traditional way of life, with little impact on ecological systems and that ensure their social reproduction based on extractive activities. However, on the other hand, coastal studies around the world warn about the impacts on this region, generated by intense urbanization and activities related to agriculture, industry and tourism. In Brazil and Mozambique, populous cities are located in coastal areas, which means the need for territorial management that proposes public policies to guarantee environmental sustainability and quality of life.

The discussion on Coastal Zone Management began in the 1970s and, according to Clark (1996), focused on erosion processes or the assessment of uses in these areas. However, from the 1980s onwards, understanding the complexity of this region led to integrated studies. Research for a new development model involves finding solutions that take into account vulnerable, complex, dynamic social needs and changes in ecological environments, such as coastal marine areas. This instrument is presented as a possible strategy for management based on ecosystem dynamics and the different uses of resources in this region. (Barragán Muñoz, 2012). Therefore, based on a multidisciplinary approach, coastal studies are essential to understanding the complexity between the natural, socioeconomic and cultural factors that act on the local behavior of coastal environments, analyzing events at different spatial and temporal scales. This complexity allows the adoption of public policies for the adequate management of this area. The implementation of these policies implies a development model that considers integrated management as a strategy for the sustainability of these areas with a view to reducing environmental risks and social vulnerabilities, especially in the current context of climate change. Scarelli (2016) argues that it is possible to develop good guidelines for Integrated

Coastal Zone Management (ICZM), which occurs through the integration of knowledge to reduce economic and social losses and increase the resilience of the coastal environment. This idea is in line with Milanés (2014), who argues that ICZM is a process of spatial planning of the coastal sea-land-air interface with the aim of preserving ecosystems and achieving, with public participation, socioeconomic objectives based on science and conceived as a governmental way of articulating municipal, sectoral and local plans for future common activities. This definition involves the need to integrate public participation in various planning instruments for better future management of coastal territories. This article is the result of cooperation between researchers from the Federal University of Pará, in Brazil, and Licungo University, in Beira, Mozambique, and aims to assess the state of the art of coastal management in these two countries based on a literature review on the subject of ICZM in these countries, with an impact on the coastal zone of Pará and Beira. Furthermore, it seeks to identify advances and continuities in actions on environmental issues in the coastal zone of both territorial units.

Material and method

Study area.

The coastal zone, as a multidimensional territory, is a dynamic area and, at a certain scale, presents problems that are common and, at the same time, specific to the geographic and socioeconomic contexts that are being studied. The Brazilian coastal zone is extensive and has a continuous coastline of over 8,000 kilometers long, considered one of the largest in the world (Braga, 2019). In Mozambique, the coastal zone is approximately 2,700 kilometers long, the third largest in Africa (Hoguane, 2007).

Methodological procedures

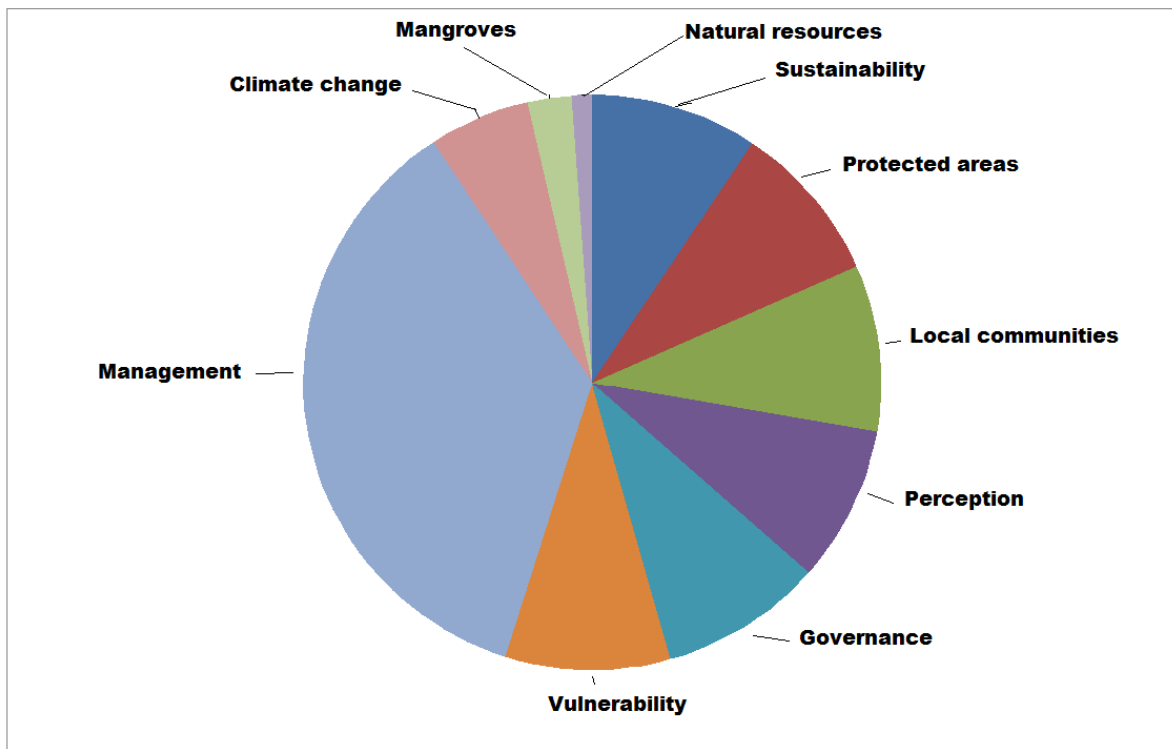
For the literature review on the topic of Integrated Coastal Zone Management, a survey was carried out in the Google Scholar database, covering the period

corresponding to 1990 and 2020, using the following keyword: Integrated Zonal Coastal Management. Subsequently, the references related to the spatial cutouts were selected in order to bring the search results closer to the research object. Among the selected articles, a qualitative approach was chosen to identify the advances and continuities in Integrated Coastal Zone Management policies in Brazil and Mozambique.

Results and Discussion

The search for academic productions in the Google Scholar database, carried out in English for the period and specific areas, returned 998 articles. Among them, review articles, research articles and books were identified. In this database, the articles were organized in tables, which made it possible to check the timeline of publications on the topic. It was observed that in the 1990s, discussions on environmental issues were on the agenda, stimulated by the important United Nations Conference on Development and Environment, held in Rio de Janeiro in 1992 (RIO-92). Therefore, there was an increase in scientific production on the management of the Coastal Zone (ZC) since this event. We also sought to locate the different approaches to the theme of Integrated Coastal Zone Management. It was important to note that, among the articles found, except for the word management, which was already related to the title of GIZC, the terms local communities, perception, vulnerability, sustainability and protected areas were especially valued (Graph 1).

Graph 1 - Proportion between the approaches found in the articles on Integrated Coastal Zone Management



Source: Research conducted on GoogleScholar between 1990 and 2020. Org: the authors, 2024.

In the analysis of the content of the articles on Integrated Coastal Zone Management, it was first found that the visibility of studies in Latin America and an integrated approach to environmental, social and economic dimensions, highlighting the focus on the conservation of ecosystems such as mangroves, coral reefs and lagoons that are of particular interest for the biodiversity of coastal marine areas. In Brazil, it was observed that the GIZC situation is the responsibility of the Union, states and municipalities. The Brazilian government, with the use of maritime resources and coastal spaces, began in the 1970s with an environmental review of state planning. In 1974, the Interministerial Commission for Marine Resources (CIRM) was formed (Decree No. 74577 of September 12, 1974). In the 1980s, the National Marine Resources Policy (PNRM) was created, through a Presidential Directive, which has the aforementioned CIRM as the implementing body. In 1988, Federal Law No. 7,661 of May 16, 1988, was approved, which initiated the National

Coastal Management Plan (BRASIL, 1988) as part of the National Marine Resources Policy and the National Environmental Policy. In 1990, Decree No. 99,213 was approved, creating the Coastal Management Coordination Group and COGERCO, updated in 1995.

The Brazilian Coastal Management Plan (PGCB) seeks to highlight the role of coastal municipalities in the planning and management processes. However, a frequent problem in the development and municipal implementation of coastal management plans in Brazil is the lack of a more consistent system and financial support in terms of investment funds. (Jablonski; Filet, 2008; Observatório Do Clima, 2021). This means that municipalities cannot implement and implement coastal management without coordination with other public management bodies, namely the State Government and the Union.

In Africa, a framework for Integrated Coastal Management (ICM) has been developed since 1994, establishing a plan based on problem identification and adoption of a coastal management plan for project implementation and investment. Based on this framework, key areas for intervention were identified with funding from the World Bank (Hewawasam, 2000). The name of the program, "Integrated Coastal Management in Sub-Saharan Africa: A Strategic Agenda," proposed joint collaboration at the international level to advance knowledge in Integrated Coastal Management, through partnerships, networking, information sharing and targeted promotion of training and capacity building in the region.

However, in Mozambique, despite the implementation of strategies at the national level, one of the problems identified is the lack of integration with municipal plans. No municipal or district development plan includes the term coastal management or Integrated Coastal Zone Management (Rosendo et al. 2018). Furthermore, according to the authors, the three thematic axes - Integrated Coastal Management, Disaster Management and Climate Change - are poorly articulated and the government's technical capacity and availability of resources affect their effective implementation.

Table 1 organizes the description of the most frequent indicators in the literature consulted in order to show a scenario on GIZC. The assessment was prepared based on the analysis of the respective indicator associated with its response, through which it is possible to recognize the advances, continuities and obstacles of the theme in the aforementioned study areas.

Shart 1 - Summary of the Integrated Coastal Zone Management scenario for Brazil and Mozambique

Brazil		Mozambique	
Extensão da costa		8.698 km	2.700 km
Responsible Environmental Agency		Ministry of the Environment (MMA)	Ministry of Land and Environment (MTA)
	Indicator	Response	Response
Advances	Regulatory framework	National Coastal Management Plan Law No. 7,661, of May 2004.	Legislation on the ZC is not integrated. There is a legal provision for Coastal Management and for the components of the ecosystem.
	Protection/Conservation Strategy	Conservation Units according to the National System of Conservation Units (SNUC) Coastal Zoning; Community Participation	Protection programs: (1) fisheries, (2) coastal and marine ecosystem management, (3) coastal and marine protection, (4) marine parks and (5) tourism with community participation (6) Mangrove management strategy (2020-2024), Resolution No. 33/2020 of May 18, of the Council of Ministers..
Permanence	Pressure on the coastal and marine ecosystem	Urbanization; Ports; Shrimp farming; Tourism.	Port activity; Urbanization; Tourism; Extraction of natural resources.
	Environmental impacts	Water and soil contamination; Deforestation; Solid waste; Loss of biodiversity.	Water contamination due to oil spills; Deforestation; Loss of biodiversity.
	Obstacles	Lack of integration between Coastal Management themes and lack of integration of the Plan at different levels of management (state and municipal).	Dependence on external financial resources for the implementation of Coastal Management Plans.

Proposals		Social and environmental justice for coastal communities. Local communities need to be better informed, empowered and officially supported in their quest to protect the ecosystems on which their livelihoods depend.	Integration of coastal management, disaster management and climate adaptation frameworks; highlight the need for greater support to local governments at the provincial and national levels; and greater clarity regarding the coastal management mandate of local governments.
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Source: Jablonski; Filet (2008); Wever et al. (2012); Chemane et al. (1997); Rosendo et al. (2018)

The findings of the literature review on Integrated Coastal Zone Management for Brazil and Mozambique were summarized in two aspects:

The consensus that socioeconomic activities exert pressure on coastal zone resources. In this region, accelerated processes of intense urbanization, mining, port activity for industrial exports and large-scale tourism exploration coincide.

The consideration of the specific characteristics of the coastal zone, such as ecological dynamics, geological/geomorphological evolutionary aspects and the interaction of marine and coastal systems, as a basis for Integrated Coastal Zone Management (ICZM), aggregating the knowledge and forms of use of traditional peoples and communities, protagonists of the conservation of coastal and marine environments, for the preparation of technical opinions and pertinent legislation.

In the analysis of the management of the coastal zone of Pará, it is observed that the Amazonian ecosystems and the very way of life of coastal communities are threatened by the intensification of the intervention of economic activities on natural resources. The current climate change scenario and the impacts that this region is subject to are projections of impacts that will be confirmed in the near future. Indicators of the impacts of climate change include flooding, erosion, and variability in rainfall patterns, for example (Braga; Pimentel, 2019). Regarding the sociocultural dimension, extractive communities are already noticing environmental changes in the resources they use for their social reproduction, especially those extracted from the mangroves. In Beira, tides have amplitudes of 4.20 m, winds, rain, wave action, and occasionally, cyclones. These agents are the main factors responsible for the

coastal dynamics determined by erosion, accumulation, and flooding phenomena. This influences the forms of occupation of the coastal zone that are frequently affected. The most extreme cases are linked to the passage of cyclones, as highlighted by Uacane (2018), the recurrence of these events drastically affects the urban and rural populations located in this region, as the city is vulnerable to extreme events, and the protection of the coastline is important to minimize the effects of erosion, silting of water bodies and defense against storms.

Regarding the coastal zone of the State of Pará (Brazil), it is agreed that in order to solve the problems of coastal municipalities, it would be necessary for the Municipal Master Plan to incorporate the premises of GIZC in solving the priority problems, which in this region are related to coastal erosion, coastal contamination, tourism, land use and planning, also adding proposals for the implementation of infrastructures to serve the local population. In Beira (Mozambique), within the scope of urbanization and coastal protection, interventions along the coastline are generally accompanied by activities to replace previously existing mangrove components, according to local environmental conditions, complying with the stipulations of the country's environmental legislation on coastal protection and mangrove preservation.

Final Considerations

The implementation of integrated management policies is considered to be the necessary tool for reducing socio-environmental and institutional risks and vulnerabilities in the coastal zone, as verified in this study.

Currently, both in Pará and Beira, the issue of managing coastal ecosystems, including mangroves, continues to require the involvement of local communities for better coordination of activities to be developed in favor of development favorable to what is recommended by the Sustainable Development Goals, advocated in the sustainability policies of a territory and its communities.

The literature consulted showed that both in Brazil and Mozambique there is a concern about having a highly promising coastal zone in terms of local resource management, although each country has its own speed in implementing policies in this sense; partly because there are conditioning factors in this desire to cooperate with nature in responding to the changes that are occurring in time and space, in the coastal zone. It should be noted that, in Mozambique, the entity managing environmental issues, even with certain changes in the sector's nomenclature, from the Ministry of Coordination of Environmental Action (MICOA), to the current name "Ministry of Land and Environment" (MTA), in collaboration with other sectors of related activities, the vision of coastal zone management has not changed much except for the improvement of environmental management strategies, with the definition of more strategies for better massification of coastal zone management, involving other management sectors such as the Ministry of Fisheries and Inland Waters, which contributes so much to this management of the coastal zone.

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Author 1; Supervision, discussion of results, bibliographic research, text review

Author 2: Preparation, textual production and discussion of results.