

Climate change and spatial justice in coastal planning in Cuba and Brazil

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Abstract: This article uses the category of spatial justice as an analytical variable to explore the coastal planning of Cuba and Brazil, in the face of the challenge of climate change. The research was conducted using a qualitative methodology, applying the technique of content analysis to instruments of physical planning, based on spatial justice indicators provided in the study. These included territorial boundaries, uses of coastal space, environmental conflicts, public participation, urban insecurity, climate migration, and social exclusion, which enabled integration of coastal planning elements in the dimensions of space, policies, and tensions in different socio-economic contexts. New variables are added to the concept of spatial justice and it is shown that this constitutes an analytical category, which, expressed through coastal planning, puts both countries in better conditions to face the impacts of climate change.

Keywords: Coastal spatial justice; territorial planning instruments; impacts of climate change; Brazil; Cuba.

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Introduction

The complexity of the environment and the impacts of climate change in different regions of the planet make it necessary to rethink the conception of spatial planning instruments and the management and use of natural resources. According to experts (IPCC, 2018), climate change will affect all countries, however, its impacts will differ according to the levels of exposure, sensitivity, and responsiveness of political, socio-economic, and natural systems. The risk will be greater for the least developed and island countries (LUQUE; RUIZ, 2014), as well as for the most vulnerable coastal communities.

Cuba and Brazil have different political, socio-economic, and natural realities, however both nations are at high risk of suffering from the impacts (PLANOS et al., 2013, VIEIRA et al., 2019). In both countries, spatial planning has the challenge of incorporating adaptation and mitigation actions to address the effects of climate change. In this context, the concept of spatial justice acquires analytical relevance to understand the nature of the changes that are needed in the management and planning of territories in the face of new climatic challenges.

Spatial justice as an analytical category of coastal planning in the face of climate change

The concept of “spatial justice” according to Brennetot (2010) has for some years now become a term of critical geography. Some authors analyze the connection between justice, development, and equity in different contexts; such as in space (SMITH, 1994; BRET, 2009; SOJA, 2010; SANTANA, 2012), territory (HARVEY, 1977), and society (HARVEY, 1977; FERNÁNDEZ, 2011), and give the theoretical discussion an eminently pluralistic dimension (BRENNETOT, 2010). They highlight studies that approach spatial justice with issues such as health (MOLINA; ASTRID, 2018) or the dynamics of the use of urban space, and with those related to new economic challenges (GONZÁLEZ, 2018).

Theoretical positions such as those of Villaseñor et al. (2017) and Fernandez (2011) stand out in the attempt to build solidarity territories, based on ethnographic research with social organizations. These studies identify patterns of socio-spatial practices in coastal areas which are vulnerable to natural hydrometeorological events, earthquakes, and tsunamis. They experimented to counter the so-called “spatial injustice” in large spatially and socially segregated territories, a product of the infrastructure deficit and the increasing marginality indicators.

Cordero (2011) analyzes the postulates of so-called “environmental justice” with the concept of “territorial planning” through a legal approach, establishing the relationships that occur between them in the formulation and implementation of public policies. This approach, from a conservationist perspective, assesses environmental justice issues in coastal areas, where environmental burdens and participation mechanisms of the directly affected communities, as well as access to environmental information, have been very weak.

In Brazil, the discussion on spatial justice is related to socio-environmental justice,

indicated by the principle of well-being. It is also an “analytical instrument that refers to the origin of the production of goods by the hegemonic system and serves to know the unequal access to the advantages and disadvantages that it generates” (RIBEIRO, 2017, p.161).

Spatial inequality reflects the inequality between rich and poor. For the latter, it becomes apparent through the chaotic organization of circulation spaces, inefficiency of public services, pollution of natural resources, and is associated with the reduction of green areas and urban leisure spaces. Socio-spatial segregation, interpreted from the instruments of spatial justice and socio-environmental justice, is visible in large Brazilian urban centers. For the reduction of these inequalities, strategic action plans are important instruments which propose the redistribution of land use, the revision of legislation, and intensification of the management model used in alliances (MENDES et al., 2011).

As the complexity of socio-economic, political, and environmental processes increases, and in the particular context of global climate change (IPCC, 2018), the relationship between space and social structure behaves in different waves. To properly manage coastal space, it is necessary to understand the characteristics, complexity, and interrelations produced in its environment, where economic, natural-physical, sociocultural, and regulatory subsystems are involved (BARRAGAN, 2010; MORAES, 2007; BOTERO et al., 2017). In this sense, the concepts regarding environmental justice collected in the scientific literature suffer from levels of integration of analytical variables, which comprehensively and integrally address these subsystems in the coastal space.

Considering this, the authors of the present article interpret *coastal spatial-justice* as those factors related with the limits of marine-land space, its uses, environmental conflicts, public participation, urban insecurity, climate migration, and social exclusion. Those factors are those which favor equal opportunities, protection and conservation of natural and human resources, and the decrease in vulnerability to the impacts of climate change.

One of the territorial planning instruments analyzed in both countries was land administration, defined as “*a process and an instrument of planning, of technical-administrative-political nature, which in the long term aims to configure organization of the use and occupation of the territory, in accordance with the potentialities and limitations of the same, the expectations and aspirations of the population, and the development goals*” (MASSIRIS, 2002 p.5).

Coastal spatial planning has a certain influence on spatial justice. Spaces of urban equality, justice, and equity can be built from the practice of integrated, sustainable, and socially acceptable spatial planning. However, the implementation of this type of system is often contradictory, exclusive, and unsustainable. Authors such as Cordero (2011) and Barragán (2010) describe similar experiences.

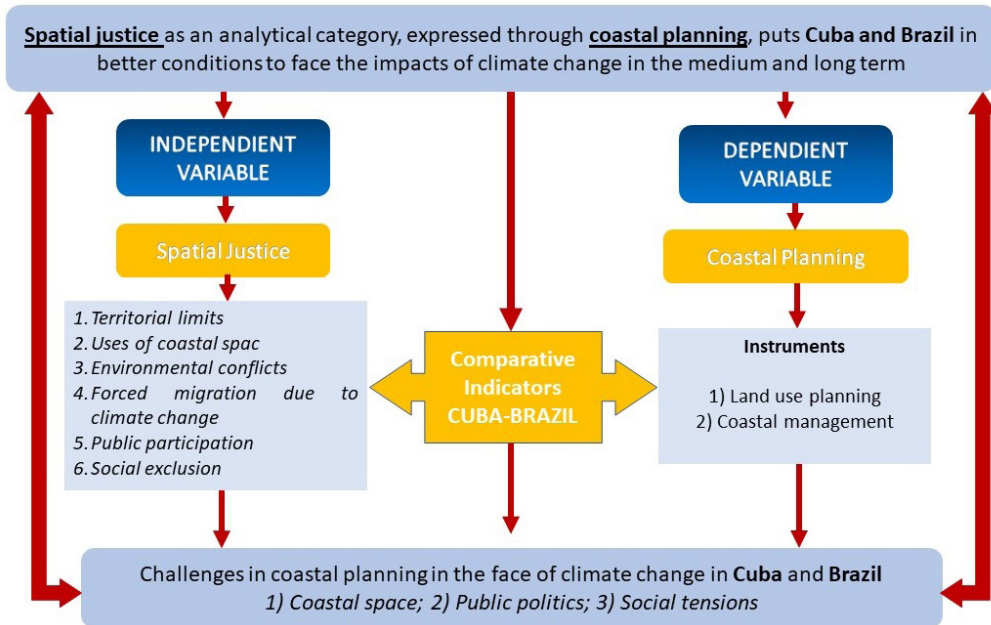
For the particular case of coastal zones, there are other spatial planning instruments such as integrated coastal zone management programmes (GESAMP, 1996), *marine spatial planning* (NOAA, 2018), coastal marine management (MILANÉS et al., 2017; MILANÉS, 2016), and ecological territory zoning. The present article is based on the following research question: How are the impacts of climate change expressed in the planning of coastal territories in Cuba and Brazil? It defends the idea that spatial justice

as an analytical category expressed through coastal planning, puts Cuba and Brazil in better conditions to face the impacts of climate change in the medium and long term.

Methodology

The present research is qualitative in nature. Content analysis was performed from different regulatory and scientific sources in Cuba and Brazil related to the study variables. A theoretical-methodological model was followed, which is expressed in Figure 1. It included the present authors' work experience related to both countries with these instruments, as well as the practices acquired in the coordination of scientific research projects, and the results of six workshops conducted with experts from both countries between the years 2013 and 2018.

Figure 1. Methodological outline of the research.



Source: prepared by the authors, 2020.

The indicators explaining the coastal spatial justice variable evaluated in the planning instruments of both countries are defined below.

Territorial boundaries—specific geographical area, with distances in the order of a few meters to hundreds of kilometers. They can extend inland from the watersheds of the hydrographic basins, to the limits of the territorial waters at sea. When establish-

ing coastal boundaries, the interaction between sea, land, and the atmosphere must be considered (BATISTA, 2018a.; MILANES et al., 2017).

The scientific literature records different *uses of the coastal space*, for example touristic, recreational, industrial, and residential usage, as well as those related to human settlements, urbanized or not, which intervene in this privileged space among others (BARRAGÁN, 2003; PEREIRA et al., 2019; BOTERO et al., 2020).

In the present study, *environmental conflicts* (WALTER, 2009) are considered to be those associated with the damage suffered by natural resources, which impacts the communities that make use of the coastal zone; the risks and impacts of climate change; the deterioration and pollution of territorial aquatic, terrestrial, marine, and atmospheric spaces; as well as those related to the violation and ignorance of environmental laws and regulations.

Forced migration due to climate change is defined by the International Organization for Migration as “persons or groups of persons who, due to unavoidable, sudden or progressive environmental changes that adversely affect their lives or living conditions, are forced to leave their habitual homes, or choose to do so voluntarily, and are known as migrants due to environmental causes” (OIM, 2008, p.15). The scientific literature reveals the increase in migration in countries in the Southern Hemisphere as being a result of this cause (OIM, 2017).

Public participation means the process by which communities, institutions, and citizen organizations participate in decision-making on the management and conservation of coastal resources, as well as in the resolution of environmental conflicts. To assess *urban insecurity*, the Global Peace Index, which measures the level of peace and the absence of violence in a country, was considered. The data used was from 2017 (IPG, 2017).

For the analysis of *social exclusion*, the Human Development Index was used, which measures the progress achieved by a nation in the following three basic dimensions of human development: enjoying a long and healthy life, access to education, and having a decent standard of living. In turn, these consider variables such as poverty; chronic malnutrition; and population without access to water, drainage, and electricity in the homes, among others.

Comparative indicators of coastal territorial planning instruments in the confrontation of climate change in both countries were analyzed considering the following categories: 1) *coastal space*, defined as *the maritime-terrestrial strip of variable width where the earth, the sea, and the atmosphere interact by natural and anthropogenic processes* (MILANÉS, 2014; MILANÉS et al., 2017); 2) *public policies*, understood as the set of laws, programs, plans, and instruments that a state promotes and implements for the planning, management, protection, and sustainability of the coastal zone (BOTERO et al., 2017); and 3) the *social tensions*, related to the causes of environmental conflicts that affect the social groups making use of the coastal zone, whose demands of the social tensions should find solutions with land planning.

Areas of study

Cuba and Brazil are nations that have long coastlines with diverse marine and terrestrial ecosystems. Located at the confluence of the Atlantic Ocean and the Caribbean Sea and at the entrance to the Gulf of Mexico, the Republic of Cuba has one of the most preserved coral reefs in Latin America (MARTÍN et al., 2010). It is the largest and westernmost of the Greater Antilles. Because of its insular position, Cuba is particularly rich in various types of coastal marine ecosystems such as wetlands, beaches, coastal lagoons, and mangroves. Due to the conditions of the archipelago, almost all of its surface is “coastal” or “marine–coastal” (CABRERA, et al., 2010).

Brazil is the fifth largest country in the world and the largest in South America, of which it covers almost half the area of. It is bordered by the Atlantic Ocean to the east, and all states of South America (except Chile and Ecuador) to the north, south, and east (www.ecured.com). The country has a wide variety of tropical and subtropical ecosystems and habitats, encompassing a range of environments and varied natural resources (WEVER et al., 2012). In Brazil, mangroves are present along most of the coast and cover an area of approximately 25,000 km² (SCHERER et al., 2010; WEVER et al., 2012). Biodiversity is exceptionally high and includes several endemic and endangered species (DIEGUES, 1999).

Results

Comparative aspects between the Republic of Cuba and Brazil

The coastal zones of Cuba and Brazil show profound differences in the number of populations settled on their margins, land mass, and coastline (Table 1). In both nations, the coastal index is high.

Table 1. Comparative aspects between Cuba and Brazil

Aspects	Cuba	Brazil
Land mass (km ²)	110,860	535,000
Coastline (km)	5,980	8,698
Coastal index ¹	1.3	1.9
Population 1990 (million inhabitants)	10.6	149.4
Population 2010 (million inhabitants)	11.2	196.8
Estimated population 2030 (million inhabitants)	11	206.8
Ecological footprint (hectare per capita)	1.95	2.9

Source: Modified from BARRAGÁN, 2011.

1 - Coastal index $\text{Log } 10 \text{ land area (km}^2\text{) / coastline (km)}$. Legend: ≤ 1 Very high; $1 < \text{ or } \leq 2$ High; $2 < \text{ or } \leq 3$ Average; $3 < \text{ or } \leq 4$ Low and > 4 Very low.

Cuba has a surface area of 110,860 km², of which 104,945 km² corresponds to the island of Cuba and 5,915 km² to Isla de la Juventud (CABRERA et al., 2011). It has more than 1,600 islets and small keys, which confirms its archipelago configuration (GARCÍA, 2003). The nation ranks 15th among the largest islands in the world (CENTELLA et al., 2001). Cuba has an extensive marine-abrasive-accumulative terrace with intense erosion processes. The biodiversity of the Cuban archipelago is the largest in the Insular Caribbean, reporting about 6,519 species of plants and more than 16,516 species of fauna (CABRERA et al., 2010). Mangrove ecosystems are attached to the coastline and coastal lagoons and comprise 70% of the island's coastal perimeter (GARCÍA, 2003). Of the country's 15 coastal provinces, only four have their capital cities very close to the sea (La Habana, Matanzas, Cienfuegos, and Santiago de Cuba).

Public policies began with a clear sectoral vision of coastal management, focusing on economic activities related to ports, transport, and fisheries, as well as others related to coastal-zone planning. Decree-law 212 on "coastal zone management" is implemented on August 14th 2000, based on the principles of integrated coastal zone management (MILANES et al., 2019; ; BOTERO y MILANÉS, 2015). The expected scenarios of average sea level increases will have diverse consequences for Cuba. Erosion processes and the recoil of the coastline, as well as an increase in the number and intensity of floods, will accentuate salinity in estuaries and threaten freshwater aquifers (PLANOS et al., 2013).

The Brazilian coast reaches 8,698 km in length, including the bays and gulfs (SCHERER et al., 2010), which makes it the 15th longest coastline in the world. The length of the Brazilian maritime border represents 32% of the national borders. The maritime zone is within 12 nautical miles offshore, and 17 states with 463 municipalities on land that house an estimated population of about 26.58% of the country's total form the coastal zone of Brazil (IBGE, 2011).

In both countries, population growth and urbanization processes in coastal areas place strong pressures on coastal resources. In Cuba, only 10% of its population (1.14 million) are settled near the immediate coastline (MESAREDONDA, 2017), unlike Brazil, which reaches about 36.5 million people, or a fifth of its population (WORLD BANK, 2006).

In both Cuba and Brazil, occupation of the territories since colonial times occurred from the coastal zones to the interiors of the countries, which explains the significant population density that today is located on their coasts. Some traditional communities in Brazil and coastal settlements in Cuba are particularly affected by the degradation of coastal forests, marine pastures, or coral reefs, as their livelihoods depend on these ecosystems, making them more vulnerable to the impacts of climate change.

Both nations with different socio-economic systems show different levels of social inequality. In Latin America, Cuba is a sustained example of planned regional action, facing the problem of breaking the spatial economic imbalance of its territory (BASSOLS; DELGADILLO, 1992). *"Brazil is a country marked by profound inequalities and enormous socio-spatial diversity. These characteristics are evident at all levels: between the four regions of the country, in each of the 27 states that make up the federation, between each of the 5561*

municipalities, and especially within each of these federated entities, which represent the local power” (ROLNIK, 2004, p.91).

Impact of climate change on the coastal areas of Cuba and Brazil

Coastal planning in both countries, due to the modification of their coastal territories, presents important challenges to address when facing the impacts of climate change. For Cuba, the greatest of these are the progressive effects that there will be on the rise of the average sea level due to climate change in two potential extreme scenarios. The great vulnerability of the territory with respect to land use is observed with increases expected to the order of 27 cm and 85 cm for the years 2050 and 2100, respectively.

In Brazil there are 5570 municipalities, most of which have less than 100,000 inhabitants. There are also some major urban centers with populations of millions. Among the ten largest cities in Brazil, five are located on the coast or influenced by the sea, with risk levels catalogued between high and very high.

Comparative performance of coastal spatial justice indicators in the regulatory and operational instruments of territorial planning in both Cuba and Brazil.

Cuba and Brazil have broad legal frameworks protected by different territorial planning regulations. Reviewing these instruments enabled the analysis and synthesis of their behaviours, using the selected variables (Table 2).

Table 2. Analysis of coastal spatial justice indicators selected from spatial planning instruments in both countries

Indicators		Cuba	Brazil
Territorial boundaries	Spatial planning instruments	Administrative political boundaries of the territory are used (GORC, 1976) and the territorial boundaries of the provinces and municipalities are defined by legal regulations (GORC, 2010; PLANAS et al., 2016). The coastal zone and its protection zone are delimited according to the types of coast, with distances on land ranging from 20 to 300 meters, and depths of 100 to 200 meters at sea (GORC, 2000).	The coastal territorial boundaries are defined by the National Coastal Management Plan – PNGC II (established by law number 7.661/1988 and regulated by decree number 5.300/2004) The maritime zone extends offshore for 12 nautical miles established in accordance with the United Nations Convention on the Law of the Sea, comprising the entire territorial sea and a land belt, formed by municipalities with direct influence on the phenomena occurring on the coast (MMA, 2008).
	Coastal management instruments	Decree law number 212 (GORC, 2000). The integrated approach is used to demarcate and delimit coastal areas (MILANÉS 2014; MILANÉS et al., 2017; BATISTA, 2018a; b; c.). Physical geographical criteria for demarcating watersheds (BATISTA, 2018a).	Law number 7.661/88 establishes guidelines for coastal management of the country. Project Orla (MMA, 2005; MORAES, 2007). Coastal ecological-economic zoning. Areas of temporary oil and gas exclusion. Sensitivity mapping of the oil coast.
Uses of coastal space		Tourism and recreation, fishing, mineral extraction, human settlements, trade, and transport, protected natural space, scientific research.	Urbanization, tourism, fishing, mariculture, industrial activity and mineral extraction, ports, oil industry.

Indicators	Cuba	Brazil
Environmental conflicts	Average sea level rise due to climate change, Land degradation (EAN, 2017). Inadequate occupation of the coastal zone and gradual increase in urbanization (MILANES, 2012; CABRERA, et al., 2011). Coastal erosion (CENTELLA et al., 2001). Overfishing and biodiversity loss.	Accidents in risk areas occupied by the poor. Loss of biodiversity due to decreased critical habitat area and fragmentation of ecosystems. Decrease in primary productivity. Deterioration and loss of coastal space and cultural-historical heritage. Reduction in diversity of natural landscapes, and coastal erosion (SZLAFSZTEIN, 2009; SCHERER et al., 2010).
Public participation	Planning tools envisage public participation, but this is not achieved in its entirety, conditioned by organizational factors and institutional management that limit participatory processes in decision-making. Added to this is the predominance of verticalist planning policies (MILANES et al., 2020; 2014). There are favorable conditions for increasing effective citizen participation, promoted by marked social equity and the achievement of positive social development indicators (health and education), among others (MONTERO y MILANES 2020; MILANES 2011; CABRERA et al., 2011)	In Brazil, the practice of public participation in decision-making is not yet fully widespread among all sectors of society. However, there are examples of community-based management, such as the Ceará fishermen's initiative. In this case, the local community created the Coastal Forum, where various issues related to coastal uses and activities are discussed by representatives of the local community, the tourism sector, industrial fishing, and government representatives from the federal, state, and municipal levels (SZLAFSZTEIN, 2009; SCHERER et al., 2010).
Urban insecurity vs Global Peace Index (2017)	88 (lower insecurity)	108 (higher insecurity)
Climate migration	1,738,000 (IDCM, 2018)	71,000 (IDCM, 2018)
Social exclusion ²	0.775	0.754

Source: prepared by the present authors, 2020

The analysis carried out determines the behavior of coastal territorial planning instruments in the face of climate change, according to the common and differing points observed between the two countries. These points are then presented qualitatively, taking into account the categories of coastal space, public policies, and social tensions.

Coastal space: both countries make use of the coastal zone for the development of activities in different productive sectors, and as human settlements. They have established physical, geographical, and political boundaries for the delimitation of their coastal zones. Physical planning tools define the distribution of space and territorial activities according to uses and activities. Brazil's coastal space is larger and more complex, with a greater number of uses and exploitation of natural resources. Its coastal boundaries are wider and differ in their sea and land distances, where municipalities stand out as spaces for planning and coastal political action. In Brazil, spatial exclusion occurs due to prices in the real estate market and the land available. The populations living in Brazilian coastal areas are larger, more unequal, and with high social vulnerability.

Physical planning instruments in both countries differ in their variety and number. In the case of Cuba, there are more instruments for land use planning.

Public policy: both countries are making efforts toward sustainable development of their coastal zones, for which they have legal standards and territorial planning instruments. In parallel, they implement integrated coastal zone management and spatial planning projects in coastal areas. Public policies in Cuba enable a higher human development index and lower social exclusion than Brazil. Cuba has a much broader legal framework for land management issues than Brazil.

Public participation is recognized in planning instruments. The rights of local communities and their ways of life in coastal areas are recognized. The development and implementation of integrated coastal zone management projects, as well as public policies for the implementation of protected areas and coastal zone management are the responsibility of the Federal, State, and Municipal Governments in Brazil.

Social tensions: both countries face conflicts of usage and of resources in their coastal zones. They face *environmental problems* such as biodiversity loss, desertification, drought, and the impacts of climate change. Brazil has more social conflicts due to the private usage and ownership of land, and the conflict of interests that this generates. Cuba is at greater risk from the impacts of climate change in its coastal zone due to its island status. In Cuba, state ownership prevails over coastal resources, sometimes generating better conditions for the benefit of the population, in negotiations, and in conflict resolution.

Discussion

Although both countries have a legal framework for physical planning, the practice of this discipline, in different contexts, shows differences and contradictions that impact on the spatial injustice. This analysis is then applied to the impacts of climate change on coastal communities. It shows its relationship with the violation of the specific regulation that governs planning activity in each of the countries compared. The coastal

municipalities of Guama in Cuba, and Belem do Pará in Brazil were taken as examples for comparison, (see Table 3).

Table 3 Main types of violations of spatial planning instruments in coastal space affecting spatial justice in communities in both countries.

Types of violations in the coastal zone of Cuba	Types of violations in the coastal zone of Brazil
Coastal socio-economic subsystem	
<p>Location of industrial areas on the immediate coastline (GORC, 2000)</p> <p>Disposal of industrial and domestic waste at sea (GORC, 2001).</p> <p>Location of urbanized human settlements on the coast (MILANES, 2012; GORC, 2000). Exploitation of natural resources to obtain raw materials for the industrial sector (GORC, 1997).</p>	<p>Invasion of public areas, areas of permanent preservation, and areas subject to geological hazards.</p> <p>Increasing infrastructure deficit, mainly for basic sanitation and living</p> <p>Unemployment and underemployment caused by the seasonality of tourism</p> <p>Informality, ignorance, illegality and/or conflicts of understanding regarding compliance with environmental legislation (e.g. permanent preservation areas, fishing regulations, and port activities)</p> <p>Uncertainty of investors and entrepreneurs regarding the stability and clarity of environmental rules for land use and occupation (FILET et al., 2001; GOUVEIA, 2009)</p>
Coastal physical-natural subsystem	
<p>Indiscriminate logging of mangroves and coastal forests (GORC, 1997).</p> <p>Increased coastal erosion, salt intrusion, droughts, and hurricane impact</p>	<p>Water pollution due to lack of basic sanitation (Federal Law N° 11445/2007).</p> <p>Chemical pollution of ecosystems due to the oil industry and port activity (Federal Law N° 12305/2010)</p>
Coastal area regulatory legal subsystem	
<p>New social conflicts in coastal communities faced with the impacts of coastal flooding</p> <p>Deterioration of sanitary and environmental conditions in human settlements</p> <p>Pollution of land-based water bodies and the sea</p>	<p>Absence of monitoring bodies and fragility of government logistics for the execution of works in conservation areas (PIMENTEL 2019)</p> <p>Increasing decline in access to public areas such as beaches (Law 7661/1988 PNGC)</p>

Source: prepared by the present authors

Coastal spatial injustice is manifested in the socio-economic subsystems of both countries in the increase of structural vulnerability of buildings, the number of popula-

tion exposed to pollution and rising average sea levels, the disappearance of settlements on the immediate coastline, the deterioration of natural resources, and the increase in displacement of the population due to environmental causes.

In the natural physical subsystem, it is expressed in the loss of natural protection for coastal communities and coastal habitats for certain species. The regulatory subsystem is formulated by the need for spatial reorganization of coastal communities, the loss of cultural identities in coastal communities, and the impoverishment of the population that has no capacity to pay costs associated with changes in their places of residence. In the socio-economic subsystem, the weakness of public policies to deal with the social cases affected leads to the loss of coastal historical cultural heritage and increased social and economic tensions.

Minimizing coastal spatial injustice depends, to a large extent, on the ability of countries to provide, through physical planning tools, a guarantee for the location and use of coastal space in safe and socially responsible areas. It also results from the use of affordable instruments for coastal families in need. Legislative and spatial planning instruments are not considered sufficient but are accompanied by practices and policies of justice and social equity.

Rule violation is not the only cause of increase in coastal spatial injustice. Other socio-economic factors, and those related to property, law of supply and demand, and adequate public policies also contribute. An example of these differences is the selection of the countries analyzed, which is based on socio-economic and political differences that are reflected in the coastal spatial justice argued in this article.

Conclusions

The theoretical discussion of this article focused on verifying the analytical capacity of the concept of spatial justice, to analyze the issues related to planning and management of territory in coastal spaces. Based on the theoretical review of different publications on the topic of spatial justice, the present authors incorporated new variables into the concept of spatial justice applied to coastal spaces, revealing its analytical potential to understand the processes associated with physical planning in coastal territories.

The comparative study found that violations of the rules and policies of physical planning in the use of coastal spaces increase the vulnerabilities of coastal communities to the impacts of climate change, being more exposed and sensitive, and sometimes with less capacity to respond, compared to the population that does not use the space.

Coastal spatial justice, assessed through the categories presented in the comparative study, allows the conclusion that both countries are making progress in spatial planning instruments in line with the needs of sustainable development at a global level. However, when evaluating the reference variables, specific differences between countries can be perceived, in part explained by the uneven physical, territorial, and historical/cultural characteristics of the two nations, as well as in the aspect of the processes of integration

of social development with conservation of the coastal environment.

The degree of participation and social responsibility of the different actors, in the processes of elaboration and implementation of spatial plans, are key elements for the reduction of the social tensions generated by environmental conflicts associated with the use of the coastal zones and the impacts of climate change. The coastal populations of both countries suffer greater spatial injustice compared to other populations, as they are more vulnerable in terms of exposure, sensitivity, and responsiveness, to the impacts of climate change. This is a challenge for coastal planning in both countries. Finally, it is determined that the greater the coastal spatial justice of the country, the better at coping with climate change from coastal planning the country will be.

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Mudança climática e justiça espacial no planejamento da zona costeira de Cuba e Brasil

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*Tema em destaque:
Urbanização, Plane-
jamento e Mudanças
Climáticas*

Resumo: Este artigo utiliza a categoria justiça espacial como variabilidade analítica para aprofundar os estudos de planejamento costeiro em Cuba e Brasil diante do desafio das mudanças climáticas. A metodologia da pesquisa teve abordagem qualitativa aplicando a técnica de análise do conteúdo aos instrumentos de planejamento físico, utilizando os seguintes indicadores de justiça espacial: limites territoriais, usos do espaço costeiro, conflitos ambientais, participação pública, insegurança urbana, migração derivada de mudanças climáticas e exclusão social. Estes foram integrados às dimensões dos conceitos de Espaço, Políticas e Tensões em contextos socioeconômicos diferentes. Conclui-se que as novas variáveis aportadas ao conceito de justiça espacial, demonstra que esta constitui uma categoria analítica, que expressada pelo planejamento costeiro, apresenta melhores condições para ambos países enfrentarem o impacto das mudanças climáticas.

Palavras-chave: Justiça espacial costeira; instrumentos de planejamento territorial; impacto das mudanças climáticas; Brasil; Cuba.

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Cambio climático y justicia espacial en la planificación costera de Cuba y Brasil

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*Tema en Destaque:
Urbanización, Pl-
anificación y Cambio*

Resumen: Este artículo utiliza la categoría de justicia espacial como variable analítica para profundizar en la planificación costera de Cuba y Brasil ante el desafío del cambio climático. La investigación se realizó utilizando la metodología cualitativa, aplicando la técnica de análisis de contenido a los instrumentos de la planificación física, a partir de los indicadores de justicia espacial aportados en este estudio, como fueron: límites territoriales, usos del espacio costero, conflictos medio ambientales, participación pública, inseguridad urbana, migración climática y exclusión social, los cuales permitieron integrar elementos a la planificación costera en las dimensiones de Espacio, Políticas y Tensiones en contextos socioeconómicos diferentes. Se aportan nuevas variables al concepto de justicia espacial y se demuestra que ésta constituye una categoría analítica, qué, expresada a través de la planificación costera, pone en mejores condiciones a ambos países para enfrentar el impacto del cambio climático.

Palabras-clave: Justicia espacial costera; instrumentos de planificación territorial; impacto del cambio climático; Brasil; Cuba

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