

ICZM in Cuba: Challenges and opportunities in a changing economic context

Adrian Gerhartz-Abraham^{a,*}, Lucia M. Fanning^a, Jorge Angulo-Valdes^b

^a Marine Affairs Program, Dalhousie University, 1355 Oxford St., Halifax, NS, Canada B3H1R2

^b Center for Marine Research, University of Havana/School of Natural Resources and Environment, University of Florida, Gainesville, FL 32611, USA



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ABSTRACT

Cuba embraced integrated coastal zone management (ICZM) after the Earth Summit, 1992. A series of legal and institutional arrangements rapidly emerged, creating a more solid framework for ICZM in the Caribbean island. Nonetheless, although nearly 48% of Cuba jurisdictional area is ocean, the scope of most ICZM initiatives in the country has been limited to coastal terrestrial issues. Thus, recognition for the inclusion of the marine component of the coastal zone in the national policies and legislation for ocean and coastal management is needed. This paper discusses a number of policy and legal shortcomings that constrain integration and success in ICZM initiatives. Such limitations coupled with opportunities arising from the current political and economic context in the island put the realization of successful ICZM at risk. Overall, the development of a new and comprehensive policy that supports integrated coastal and ocean management in Cuba is critical for: i) addressing the gaps and limitations of the national ICZM approach; and ii) addressing the imminent challenges and opportunities that the new Cuban economic model may represent to the national governance of ICZM.

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1. Introduction

The health of the world's ocean is in decline [1]. As a result of a burgeoning population, human activities such as fishing, aquaculture, oil and gas exploitation, tourism, agriculture, coastal development and shipping continue to put considerable pressure on the world's ocean and coastal environments [2,3]. Coupled with the impacts arising from global climate change, this has led to a reduction in the capacity of marine ecosystems to produce the goods and services that humans and other biota on the planet depend [4,5]. Thus, effective coastal and ocean management is essential for maintaining the well-being of both the natural systems and the humans that depend on them. However, conventional sectoral ways of ocean management have not proven to be effective in addressing the multiple use/multiple user nature of coastal and marine ecosystems [6–9]. Consequently, the adoption of a more holistic approach to ocean management is needed [9].

Integrated Ocean and Coastal Management (ICOM) has been advocated as one of the most powerful tools in marine management to address the deficiencies associated with sectoral management [10]. In 1992, the Earth Summit's action program in Rio de Janeiro encouraged all countries to embrace this approach and

to incorporate it into their pertinent marine policies [11]. Consequently, an ever increasing number of countries started to implement ICOM as a management tool [12–15]. Though no unique definition exists, it has been widely recognized as a dynamic, continuous and iterative process designed to promote sustainable management of coastal zones [16–18]. As a result, the term is embraced differently depending on the particular circumstances or context in which ICOM is adopted. Thus, different approaches of ICOM may be found throughout the world. Notwithstanding the differences in approaches, some common principles are embedded in this concept that are essential for guaranteeing the desired results of any ICOM initiative [19,20].

Cuba, the largest country of the Greater Antilles has endorsed this new approach of integrating management since the 1990's. However, although some local initiatives have proven to be effective, mostly all of the effort has focused on coastal issues, limiting the scope of Integrated Coastal and Ocean Management to only Integrated Coastal Zone Management [21–24]. As such, issues regarding most of the marine-based activities such as offshore fishery activity and oil and gas exploration are not addressed. Likewise, Cuba is in a process of actualization of its economic and social development model [25]. This process implies a series of changes that present a number of opportunities but may also further exacerbate the current ocean governance regime in Cuba if not planned for carefully. This paper argues that a new comprehensive ocean policy for ICOM in Cuba is critical for addressing the

* Corresponding author.

E-mail address: adrian.gerhartz@dal.ca (A. Gerhartz-Abraham).

present gaps in the Cuban approach as well as the future opportunities and challenges. In this sense, the research provides a review, from a governance perspective, of the national framework in which the Cuban model of integrated coastal and ocean management is inserted. An analysis showing major strengths and shortcomings of the Cuban approach is provided. Finally, the implications of the new Cuban economic policy for the future perspectives of ICOM in Cuba is explored.

2. Cuban context

2.1. Division of powers

Cuba is a socialist developing country with a history of more than 400 years of Spanish colonialism followed by 60 years of so-called neocolonialism until the Cuban Revolution of January 1st, 1959. The Constitution establishes the Republic of Cuba's Political Regime and the division of public power. The Constitution states that Cuba is an independent and sovereign socialist state of workers. It is a unitary, democratic republic [26]. It guarantees personal ownership of earnings and savings from private work, as well as housing that has legal title of ownership, and other goods and objects that serve to satisfy the material and cultural needs of the individual [26]. Recent legislation also provides room for small private business, such as private restaurants and the renting of houses. Private ownership of the land is allowed, but trade is not permitted and most of the land belongs to the State.

The National Assembly of People's Power is the supreme organ of state power. It represents and expresses the sovereign will of all the people. The National Assembly of People's Power elects the State Council from among its deputies. The President of the Council of State and Head of Government has the authority to propose the members of the Cabinet to the National Assembly of People's Power, once he or she has been elected by it [27]. During periods of national emergencies, including war, the National Defense Council, whose mandate and organization are specified in law, assumes a lead role.

The government is organized in several Ministries, which exert top-down management [28]. The country is organized into provinces and municipalities, each having its own Assembly of

Delegates that represents the people's interests [27]. Delegates to local Assemblies and Deputies to the National Assembly are elected by direct vote [26]. Although the current policy aims at providing local government with much more decentralized authority for making decisions, so far it has been very limited.

2.2. Natural characteristics of Cuban waters

The archipelago of Cuba is the largest country within the Caribbean and one of the major contributors to regional marine biodiversity [29]. Its insular shelf covers an area of approximately 67,832 km², and its coasts, 5746 km long, are home to areas of pristine massive mangrove wetlands, tropical forests, coastal mountains and white sand beaches, each with its particular associated biodiversity [30]. Cuba's maritime domain accounts for 96,436 km² or approximately 48% of all Cuba jurisdictional area (Fig. 1).

Several environmental non-governmental organizations (NGOs) such as The Nature Conservancy and Conservation International have identified the Caribbean region as a priority for marine conservation [31,32]. Caribbean coral reefs are of particular concern as the region harbors about 26,000 km² of coral reefs, representing 7% of the world total [33]. Within the Caribbean region, coral reefs are recognized as one of the most important ecosystems due to biodiversity and ecological underpinning role [34].

Marine biodiversity of Cuba is considered as 'unparalleled in the hemisphere' [35]. For instance, Jardines de la Reina, one of the hot spots of marine biodiversity in Cuba, retains one of the most natural marine environments around the world. Overall, the archipelago contains a variety of some of the typical marine ecosystems found in tropical waters, from coral reef habitats to extensive seagrass beds and more than a dozen estuaries and coastal lagoons. In addition to their contribution as a touristic attraction and a source of livelihood for many Cubans, coral reefs provide habitat for a vast number of sedentary calcareous organisms such as algae, corals or other madrepores, which contribute to the formation of sandy beaches. The associated mangrove forest ecosystem, which are an important biodiversity feature in Cuban coasts, are characterized by their ability to grow and prosper along coastlines in the saline sediments. These salt-tolerant woody

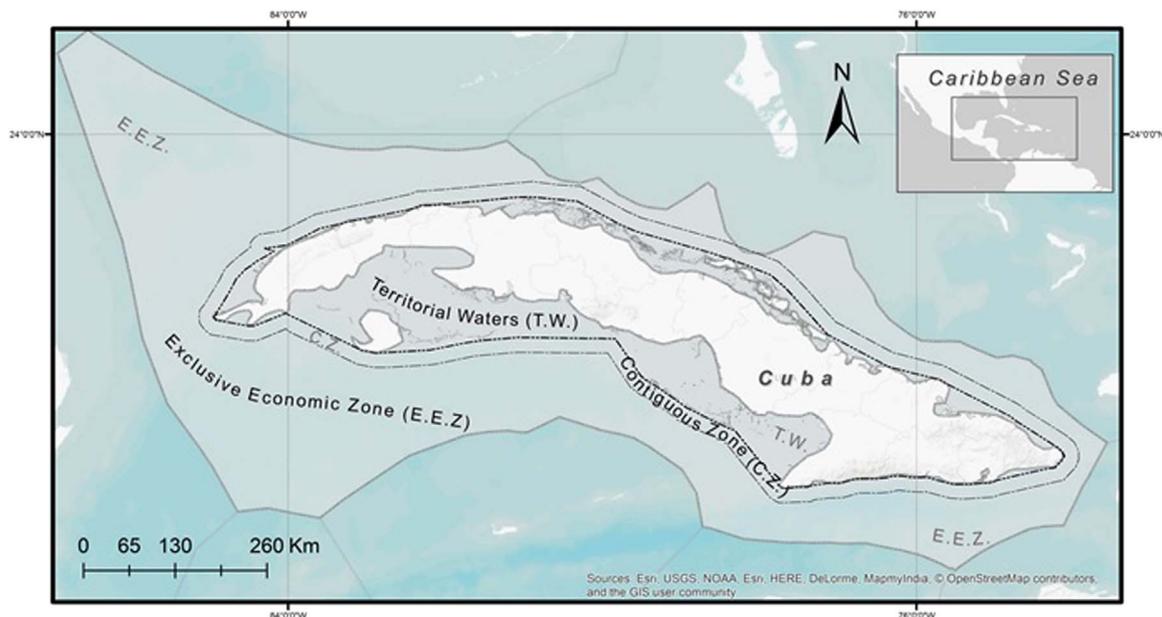


Fig. 1. Cuba's maritime zones.

plants act as a refuge or nursery for varied species and play an important role retaining carbon dioxide and capturing solar energy for photosynthesis [36].

Maintaining such marine ecosystems in healthy conditions is vital given the role they play as a fundamental provider of good and services which support hundreds of communities established along the Cuban coastal zone. Some of the major industries in Cuba benefiting from these ecological services are fishing, food, tourism, and medicine industry.

2.3. Marine and coastal issues in Cuba

Notwithstanding the high diversity and relative good health of most marine and coastal ecosystems in Cuba, environmental pollution has been present in the islands for many decades, constituting a threat to biodiversity in its widest sense. At present, five major environmental problems have been documented according to the National Environmental Strategy (NES) [37,38]: soil erosion, deforestation, pollution of inland and coastal waters, increasing loss of biodiversity, and poor sanitation in cities and rural areas. However, while pollution in the marine environment, overfishing, coastal erosion, increasing salinity in shallow waters, habitat degradation and loss of biodiversity are considered the main issues affecting the marine and coastal environment, they have not been adequately recognized as issues in the NES, where the majority of attention has been on terrestrial problems [39]. This is a significant policy gap since it threatens the ongoing health of reef ecosystems which have been documented as significantly declining in the Caribbean, representing a considerable negative impact to the local economies [34]. In Cuba, studies have reported coral bleaching as a major problem [40,41]. Between 50% and 70% of coral reefs suffer from different types of damage due to the impacts caused by human activities that affect the marine environment. Along with increased global temperatures, contamination by organic waste and toxic substances have been identified as major threats to coral reefs [27].

Fishing is yet another issue with significant impact in Cuban's waters. For instance, the decrease in finfish fisheries in Cuba since the late 1970's is well documented [42]. Finfish fisheries like most of the Cuban fisheries are currently characterized by being small-scale, low-tech, multi-specific, multi-gear, coastal, and, from a planning and management perspective, are organized using regional fishing zones [43,44]. However, limiting boats from one fishing zone into another remains a challenge in practice. Although the finfish fishery is not among the most important fisheries in terms of national revenues, it does have a significant impact at a local level. The major revenue comes from the lobster fishery which brings in two-thirds of the total fishery-income [43]. However, recruitment levels of this lucrative resource has been shown to be declining in Cuba due to a number of anthropogenic factors not directly related to overfishing, such as the effects of increasing dam construction interrupting the natural run off of nutrient-rich fresh water to spiny lobster habitat [45,46]. Additionally, ecological and natural factors affecting the species include increased salinity affecting larvae and prey species, incidence and severity of hurricanes impacting habitat structure and changes in inshore-offshore water exchange resulting from increasing coastal development [46]. To summarize, significant problems that the Cuban fishery face include not only direct impacts from overfishing, discards and bycatch, exacerbated by the lack of long term data to estimate the size of most exploited species being harvested within Cuban waters [42], but also indirect anthropogenic and naturally occurring factors. These problems are not limited to the fisheries sector as they also result in negative consequences to marine biodiversity and habitat degradation. Furthermore, ongoing land-based sources of pollution

and sedimentation influence the coastal environment in Cuba, especially in areas with developed industries and high population densities [43]. Habana, Nuevitas, Mariel and Cienfuegos are among the main cities with this problem [43].

3. Coastal-marine environmental policy in Cuba

A significant change in Cuba's environmental policy took place in the 1990s when new amendments to the Constitution were made, aimed at incorporating sustainable development principles to protect the environment [47]. However, it is important to bear in mind that the first environmental law of Cuba was issued in 1981 [48]. Nonetheless, it was not until the Earth Summit in 1992 that Cuba started to put efforts into developing a modern and sophisticated plan for environmental protection and sustainable development. Energy, environment and socio economic development became key strategic objectives of the Cuban policy aimed at improving economic growth and quality of life of the Cuban population [49]. A major step in the development of the current coastal-marine environmental policy in Cuba was the creation in 1994 of the Ministry of Science, Technology and Environment (CITMA). The institution was established to develop environmental, science and technology policies and became the representative and coordinating body charged with the preparation of integrated coastal and ocean management (ICOM) policies, plans and programs [48,50]. The creation of CITMA laid the groundwork for the enhancement of national environmental policy and legislation. Nevertheless, its limited bureaucratic performance, a characteristic of most Cuban institutions, has hindered the science needed to inform decision making.

In 1997, the National Environmental Strategy was adopted and in the same year, Law No. 81 (Law of Environment) was passed [27,48,50]. This represented a framework statute that established rights and responsibilities, institutional arrangements, and decision-making authority in a vast array of environmental areas [47]. The National Environmental Strategy is the governing document of the Cuban environmental policy formulated to achieve the goals of sustainable economic and social development. It establishes the principles on which the national environmental work is based, characterizes the major environmental problems of the country and proposes ways and tools for its prevention or minimization and specifies the actors needed for implementation [38]. Yet, this strategy focuses principally on terrestrial issues, ignoring for the most part, the need to protect Cuba's huge marine patrimony.

Cuban environmental legislation evolved significantly since Law No. 81 was passed in 1997. This statute was soon followed by a new Forestry Law in 1998 and forestry regulations in 1999, the Protected Areas Decree Law in 1999, Decree-Law 200 on Environmental Contraventions in 2000, Environmental Impact Assessment regulations in 1999, and the Coastal Zone Management Decree-Law 212 in 2000. This latter Decree served to establish the general principles for the conservation and improvement of living and non-living resources of the coastal zone and relates directly to coastal wetland ecosystems, particularly mangrove forests [28]. It also provides guidance to deal with the increasing amount of tourism and other economic development occurring along the shorelines of the island [27].

4. Cuban approach to ICZM: gaps and limitations

Integrated coastal zone management is characterized by being a dynamic, multidisciplinary, iterative and participatory process to promote sustainable management of coastal areas balancing environmental, economic, social, and cultural objectives over the

long term [19]. In Cuba the concept of ICZM attempts to address some of the terms embedded in this definition.

Matos [51] highlighted Cuba's tremendous potential for developing effective integrated coastal management, with its environmental legal framework and political system favoring sound ICZM initiatives. For instance, the Coastal Zone Management Decree-Law 212 [52] explicitly states that it aims to establish arrangements for the demarcation, protection and sustainable use of the coastal zone and zone of protection, according to the principles of ICZM. However, throughout this regulatory document there is no conceptualization of ICZM for the specific Cuban context, even though a basic premise for implementing a legal statute is to achieve clarity in general terms so as not to cause misunderstandings and different interpretations [53]. Nevertheless, in 2009, Garcia argued that although there is no pronounced conceptualization of ICZM, the Coastal Zone Management Decree-Law does address the general objectives, achieving an adequate definition of the coastal zone and zone of protection, their main uses and limitations [54].

It has also been argued that most of the environmental legislation in Cuba can be applied to address issues in the coastal zone and a number of earlier ICZM case studies in Cuba that are coastal-focused have lent support to this claim [22,23,55]. However, given the extent of Cuba's marine jurisdiction described earlier in the paper, it would appear critical to incorporate a more ocean based approach into the national legislation for ocean and coastal management.

With the second cycle of the National Environmental Strategy in 2007, ICZM gained a more serious and strong recognition. This time the Strategy literally accounted for 'a process of gradually strengthening the integrated management of the coastal zone, and its links with economic and social development and environmental protection' [37]. It was the first time Integrated Coastal Zone Management, albeit still focusing on the terrestrial component of the coastal zone, was declared an instrument of environmental management that took into account the principle of integration. Nonetheless, the latest cycle of the National Environmental Strategy 2011–2015 [38] still does not identify Integrated Ocean and Coastal Management as a national policy instrument, demonstrating the ongoing limited attention to the marine component of the coastal zone. However, some of the policy instruments identified in the Strategy (such as land use planning) do incorporate aspects of integrated coastal management for their coastal plans [48]. As well, a specific procedure for the declaration of areas under this form of management (Zones under Integrated Coastal Management Regime) was introduced and is considered a novel step in the implementation of the National Environmental Strategy [48,57]. As a result, many regions are currently working towards the designation of areas under the ICZM regime. According to Milanés-Batista and colleagues, there are currently 15 zones under this type of ocean governance regime [48]. The National Coastal Group, established in 2002, acts as a technical body to monitor the implementation of this process [27,48]. To date, the effectiveness of the Zones under Integrated Management Regime has not been assessed but given the bureaucratic requirements for seeking such recognition and the lack of resources available to implement recommended actions, it is likely that the full expectation of the tool is yet to be realized.

More recently, the growing need to integrate across the diverse planning instruments that affect the Cuban coastal zone has been highlighted as essential for achieving comprehensiveness within this territory [56]. These relate to the spatially-overlapping management areas in the coastal zone, including areas for integrated river basin management, territorial planning for coastal municipalities, and coastal-marine management. As noted by the authors, 'their effectiveness appears hampered by a general disconnect

between the instruments despite their shared geographic area' [56]. Other factors hampering a more integrated approach to these spatially-shared areas that were identified include the lack of a systematic approach to enforce regulations and the interest and/or capacity of the responsible agencies to implement needed interventions that can meaningfully address problems in an integrated manner in coastal areas.

Another aspect critical to discuss here is the lack of some of the fundamental principles of ICOM in Cuba's framework for its integrated management approach. It has been argued that in order for the principles to be useful they should inform a coherent integrated strategy at the national level [20,58]. Several guiding principles such as sustainable development, ecosystem based management, precautionary approach, integration, public participation and adaptive management have been globally recognized as having great importance in Integrated Ocean and Coastal Management [19,20]. Nonetheless, only sustainable development is the principle recognized in the legislative framework for ICZM in Cuba. In the National Environmental Strategy 2011–2015, the ecosystem based management principle is embraced as well as others principles that were adapted to the particular Cuban context. However, principles that are not considered and that should be incorporated in the national framework for ICZM and play an increasingly more important role are precautionary approach, integration, adaptive management and public participation. Specifically referring to public participation, Matos [51] noted that this principle is crucial for guaranteeing success in ICZM. Recently, Zequeira-Corzo and co-authors [59] highlighted the lack of public participation in some of the local initiatives developed in the western part of the country. The reasons for this are complex and some have pointed to the need to enhance environmental education among all stakeholders [60], including coastal communities while other have pointed to a lack of engagement arising from the centralization of power in Cuba [44]. Regardless of the underlying causes, successful integrated management requires stakeholder commitment to achieve a comprehensive understanding of the needs and values of each particular case [61]. For this, it is critical that the ICZM approach in Cuba works towards an understanding of the stakeholder relationships and overlapping interests to evaluate barriers and enablers of stakeholder commitment and cooperation in management [61]. This crucial gap in ICZM principles along with poor enforcement of current laws affecting the coastal zone and the lack of a national plan and guidelines for implementing ICZM in Cuba across the land-sea interface suggests a lack in consistency with some of the international guidelines developed for Integrated Ocean and Coastal Management [19,57]. These challenges to integrated management need to be addressed if an effective ICZM approach is to be achieved in Cuba.

5. ICZM in the context of a new Cuban economic model

In 2011, the Cuban Communist Party approved The Guidelines for the Economic and Social Policies of the Party and the Revolution. The document identifies the economy's major shortcomings and proposes pathways to move forward. These guidelines constitute a shift in the existent Cuban economic model, seeking a solution to the persistent crisis that has characterized the country since the collapse of the Soviet Union. It is indeed a new policy that seeks to insert Cuba into the globalized economy through 'a greater role for market relations and non-state property in the management of the economy' [62].

Hernandez and Dominguez [63] summarized three major declarations in the guidelines: national savings must be increased; exports need to be bolstered; and domestic production of food stuffs should substitute for imports. Furthermore, the guidelines

also mention that decision-making will be decentralized, which affects ‘the management of production and services, distribution and the market, especially through an attempt to grant greater autonomy to state enterprises’ [25]. Overall, this policy seeks to ‘redistribute power from central economic authorities to local and regional management and to increase municipal autonomy’ [25]. In addition, ‘the non-state sector will grow to absorb workers shed from the bloated state sector’ [25].

In contrast to these recent changes affecting the distribution of decision making authority to local and regional levels, Cuba has long recognized the need to encourage foreign investment to the country, particularly in light of the collapse of the support from the Soviet Union and the sanctions imposed by the United States under the 1992 Cuban Democracy Act (the “Torricelli” Act), the 1996 Cuban Liberty and Democratic Solidarity Act (“Helms-Burton” Act), and the 2000 Trade Sanctions Reform and Export Enhancement Act. To garner foreign investment and tourism, Cuba introduced a series of foreign investment laws, beginning in 1982. Following the collapse of the Soviet Union in 1989, Cuba introduced and passed Foreign Investment Law Number 77 which led to a substantial increase in investment from some \$3,510,000 to \$15,600,000 by 2005 [64]. As noted by Ortiz, over the subsequent six years foreign investment under Law 77 escalated to \$110,000,000, largely due to support and agreements with Venezuela in which Cuban medical services were exchanged for oil and investment opportunities [64]. However, with declining stability in Venezuela, lack of credibility of the Cuban government and bureaucratic obstacles, the Cuban economy has declined since 2011. As a response to this situation and under the mandate of the before-mentioned Guidelines, a new Foreign Investment Law Number 118 was issued in 2014 [65]. As noted in Articles 2 and 3, the Law is aimed at promoting diversification and expansion of export markets, advancing its technologies, obtaining external financing, creating new jobs, furthering the country’s involvement in renewable energy and environmental sustainability, and much more [64,65].

This “updating” of the Cuban economic model (as this process is commonly known in Cuba), aims to transform the model of political and social organization initiated in the 1960s. As a consequence, it may have a significant impact on the current governance framework under which ICZM is established. Furthermore, this is especially likely when coupled with the December 2014 announcement by the USA and Cuba to reestablish diplomatic relations and the US President’s statement that he wishes to end the Cuban embargo [66] as well as his recent visit to Cuba in March 2016. As such, this seems to be an appropriate time to revisit the question raised by Whittle about whether Cuba will subordinate environmental protection goals to economic development priorities like so many other developing countries have done, particularly in light of the need for foreign investment [30,35]. Despite its existing environmental legal framework, given the disconnect and lack of an integrative mechanism for addressing issues relating to terrestrial, coastal and marine decision making [24,56], it is conceivable decision making under the new economic model may exacerbate efforts to manage the coastal zone as an integral unit. This would be unfortunate for Cuba as countries around the world are moving towards a more ecosystem-based approach to management in which the sustainability of the goods and services provided by coastal ecosystems are increasingly being recognized as essential for economic development and societal well-being. New policies aimed at developing sea-related industries such as marine transportation, offshore oil and gas exploration (within the EEZ), tourism and coastal development may bring new conflicts and environmental problems to Cuban’s waters. The key question for Cuba then is how to approach these changes so as to benefit from the opportunities they present

while ensuring, if not enhancing, good environment quality. Key lessons from the global arena include the adoption of good governance principles, including public participation, accountability and transparency in the legal and institutional frameworks. Other success factors include an increase awareness of the linkages between environment, development and society as seen in novel eco-touristic approaches, greater empowerment to those affected by decisions including coastal communities, the use of best available knowledge (scientific and local) to inform decision making and the ability to ensure compliance and minimize conflict through engagement and improved legitimacy granted to those making decisions by those affected by the decisions [67–69]. A more bottom-up approach, supported by an enabling legislative framework that incorporates good governance principles and best practices, could be explored as a new and potentially viable alternative for ICZM in Cuba.

The process of actualization of Cuba’s new economic and social development model may be a ‘window of opportunity’ and trigger for changes in the existing ocean governance regime in the country. In other words, a trigger to push the development of a new ocean governance framework for Cuba that makes ICZM more integrated and holistic and one that recognizes the need to integrate across the land-sea boundaries. Institutional arrangements (one of the element of any ocean governance regime) could perhaps be a good start, to improve this process. Institutional change has been proven to be a very successful variable for efficient ocean governance [70]. There is some evidence of such change underway in Cuba as some areas that affect ICZM in Cuba are being evaluated and changes in the legislation are expected to occur soon. For instance, the legal framework of Cuba’s fishery and environmental policy is currently undergoing revisions [71]. Within the fishery arena, the use of cooperatives, catch limits for all fisheries as well as territorial fishery management are new terms that might be at the core of the new fishery policy in Cuba. As part of the new policy, a National Action Plan to address both fishery management and conservation of sharks and rays has been developed, suggesting a recognition by decision makers to not only better manage the fishery resources but to do so in a way that contribute to worldwide actions aimed at addressing biodiversity concerns of threatened and endangered species. Such policy changes are in part due to the growing realization of persistent problems in the marine environment as well as being consistent with the new changes that are occurring in the country.

6. Enhancing Cuba’s efforts at ICZM

Despite the shortcomings and the challenges associated with Cuba’s new economic model for effective ICZM, recent efforts have been carried out to overcome some of the limitations that hamper effective ICZM practices. In particular, a number of workshops held with government, academic and coastal community participants in Colombia and Southeast Cuba have provided a number of examples of best practices and recommendations [24,56]. The intent of the workshops was to test an indicator framework for assessing integrated effectiveness of land and marine planning in Colombia and Cuba. The insights and expertise of the participants provided suggestions to facilitate a more appropriate governance structure that builds on the strengths that currently exist for addressing coastal sustainability issues within the country. They also highlight the need to incorporate accepted principles for coastal and marine ecosystem-based management such as integration across and within environmental, social and economic sectoral agencies and greater stakeholder awareness and participation in the development of local area strategies.

Specifically, it was noted that a legal requirement for

monitoring and evaluating the success of coastal planning instruments (whether they be legislative decrees and laws or policies and plans), needs to be an essential component of an enhanced governance mechanism. Key indicators for assessing governance effectiveness included the level of integration, planning, participation, responsibility, communication, implementation and the need to balance social, economic and environmental objectives, recognizing that trade-offs will have to be made [56]. The inclusion of an indicator to assess implementation was seen as essential to assess governance performance in terms of having the ability to be both accountable for implementation and to institute good governance practice that would require the monitoring and evaluation of decisions with regard to their implementation. Additionally, the implementation indicator should also be used to measure the use of each of the planning instruments in the different coastal areas to assess the level of integrated coastal zone management across those overlapping spatial areas spanning the land-sea interface [56].

Furthermore, the importance of engaging local stakeholders to work jointly with government experts in identifying key issues and potential solutions was seen as critical to achieving ICZM success in Cuba. By bringing together these actors at the workshops to jointly evaluate the effectiveness of the governance processes in place for river basins, territorial planning at the municipal level and coastal and marine management, the government experts were able to understand directly the weaknesses and strengths of the planning instruments they are responsible for, with respect to each of the assessment indicators. They were also able to hear first-hand from the users of coastal resources and space what the priority issues were and possible local strategies to help alleviate them, as well as use the workshop to enhance the awareness level of the current governance processes among non-state actors. As such, all participants felt included, engaged and empowered. For government participants, their ability to influence changes in the governance processes arises as a direct result of their participation in the evaluation of the effectiveness of the instruments they are responsible for implementing. Overall, the process was seen as facilitating a participative and inclusive way for identifying areas for improvement in managing issues affecting overlapping spatial areas in the coastal zone. It was also seen as contributing to both enhancing compliance and legitimacy of the decisions being made and ensuring accountability by the agencies and organizations involved in implementation. This was viewed as instrumental in enhancing the existing governance processes and supporting the development of agreed strategies with local actors who have vested interests in the coastal area.

Finally, it is important to mention the first publication on integrated coastal zone management in Cuba as the most recent example of collaboration across universities (academics) and government institutions (policy makers) [72]. This represents a major step in contributing to strengthening institutional and individual capacities across jurisdictional scales within the island. However, while the publication reviews the state and provides examples and opportunities for enhancing integrated coastal zone management that build on some 20 years of experience and expertise in ICZM in Cuba, only the chapter on protected area management specifically includes a marine component in terms of marine protected areas [73]. Furthermore, the authors provide recommendations that link the need for more effective integration with other sectors, namely a better implementation of ICZM across the land-sea interface, in order to achieve conservation goals.

7. Conclusion

Cuba took important steps toward environmental protection and sustainability in the early 1990s that laid the groundwork for

the further development of coastal-marine policies. The Coastal Zone Management Decree-Law and the National Environmental Strategy became the most concrete examples targeting improvement in this area. However, efforts to keep up with current integrated and ecosystem-based approaches to managing its coastal resources across land-sea boundaries have stagnated. Attention have tended to focus on addressing terrestrial issues, lacking the integration needed to connect river basin management with coastal management efforts, thereby undermining the full level of success that could be realized from an integrated approach. Our review has shown that the national framework of ICZM in Cuba is still weak and more robust instruments are needed, embracing principles such as integration, ecosystem based management, sustainability, precautionary approach, transparency, participation, co-management and adaptive management.

In addition to increasing linkages across the land-sea interface, mechanisms should be explored to overcome the lack of local stakeholder engagement and weak public participation in the different phases of ICZM. Addressing the gaps and limitations at a national level are critical for improving ICZM governance at local scales. As noted from the workshop findings on indicators of good governance, some of the key attributes are lacking in local ICZM initiatives (e.g., integration, local stakeholder engagement, etc.). In a country with more than 50 years of a centralized working culture, management decisions have been predominantly top-down. As a result, local government capacity/authority to execute local initiatives that are not supported at a national level is significantly constrained. To address this shortcoming, it is imperative to have a strong national policy framework if implementation of such policies at local scales is to be maximized. Hence the urgency in advancing the development of a more national comprehensive policy for ICZM in Cuba that bridges the multiple jurisdictional and spatial scales needed to be successful.

The new economic model of Cuba, driven by pecuniary needs, when coupled with the potential for increased investment arising from a 'thawing' of relations between Cuba and the USA can indeed be an appropriate reason to seize the opportunity and promote changes in the Cuban current policy of Integrated Coastal and Ocean Management. Such particular context may be the needed impetus for policy makers to explore new integrative arrangements in the governance framework that promotes local engagement and empowerment in order to improve legitimacy of the regulatory regime and hence compliance. However, though the context may be favorable for Cuba environmental lawmakers to be engaged in a national revision of ICZM, political will as well as increased capacities are fundamental ingredients to make such feat a reality.

References

- [1] Global Ocean Commission, *From Decline to Recovery: A Rescue Package for the Global Ocean*, Oxford, 2014, p. 88.
- [2] B.S. Halpern, S. Walbridge, K.A. Selkoe, C.V. Kappel, F. Micheli, C. D'Agrosa, et al., A global map of human impact on marine ecosystems, *Science* 319 (2008) 948–952.
- [3] C.M. Crain, K. Kroeker, B.S. Halpern, Interactive and cumulative effects of multiple human stressors in marine systems, *Ecol. Lett.* 11 (2008) 1304–1315.
- [4] A.T. Charles, *Sustainable Fishery Systems*, Blackwell Science, Oxford, 2001.
- [5] N. Ash, A. Fazel, Biodiversity, *Global Environmental Outlook GEO-4: UNEP*, Washington, DC, 2007, p. 540.
- [6] M.E. Portman, T.M. Dalton, J. Wiggin, Revisiting integrated coastal zone management: is it past its prime? *Environ.: Sci. Policy Sustain. Dev.* 57 (2015) 28–37.
- [7] F. Douvère, The importance of marine spatial planning in advancing ecosystem-based sea use management, *Mar. Policy* 32 (2008) 762–771.
- [8] S. Katsanevakis, V. Stelzenmüller, A. South, T.K. Sørensen, P.J. Jones, S. Kerr, et al., Ecosystem-based marine spatial management: review of concepts, policies, tools, and critical issues, *Ocean Coast. Manag.* 54 (2011) 807–820.
- [9] R.K. Craig, *Ocean governance for the 21st century: making marine zoning*

- climate change adaptable, *Harv. Environ. Law Rev.* 36 (2012) 305–350.
- [10] A. Nobre, Scientific approaches to address challenges in coastal management, *Mar. Ecol. Prog. Ser.* 434 (2011) 279–289.
- [11] N.A. Robinson, L. Astorga, T. Oksanen, E. Trigo, O. Pastora, P. Pastor, et al., *Agenda 21: Earth's Action Plan*, IUCN, Gland (Suiza), 1993.
- [12] B. Cicin-Sain, R.W. Knecht, D. Jang, G.W. Fisk, *Integrated Coastal and Ocean Management: Concepts and Practices*, Island Press, 1998.
- [13] G. David, M. Leopold, P. Dumas, J. Ferraris, J.-B. Herrenschmidt, G. Fontenelle, *Integrated coastal zone management perspectives to ensure the sustainability of coral reefs in New Caledonia*, *Mar. Pollut. Bull.* 61 (2010) 323–334.
- [14] R. Tiller, T. Brekken, J. Bailey, Norwegian aquaculture expansion and integrated coastal zone management (ICZM): simmering conflicts and competing claims, *Mar. Policy* 36 (2012) 1086–1095.
- [15] J. Cooper, Progress in integrated coastal zone management (ICZM) in Northern Ireland, *Mar. Policy* 35 (2011) 794–799.
- [16] S. Olsen, P. Christie, What are we learning from tropical coastal management experiences? *Coast. Manag.* 28 (2000) 5–18.
- [17] B. Cicin-Sain, S. Belfiore, Linking marine protected areas to integrated coastal and ocean management: a review of theory and practice, *Ocean Coast. Manag.* 48 (2005) 847–868.
- [18] R. Sarda, C. Avila, J. Mora, A methodological approach to be used in integrated coastal zone management processes: the case of the Catalan Coast (Catalonia, Spain), *Estuar. Coast. Shelf Sci.* 62 (2005) 427–439.
- [19] UNESCO, *A handbook for measuring progress and outcomes of integrated coastal and ocean management*, IOC Manual and Guides, Paris, 2006.
- [20] J. McKenna, J.A.G. Cooper, A.M. O'Hagan, Coastal erosion management and the European principles of ICZM: local versus strategic perspectives, *J. Coast. Conserv.* 13 (2009) 165–173.
- [21] C. Milanés-Batista, J.L. Rodríguez-Abad, Resultados del proyecto territorial. Estrategias de costa a partir de la integración. Centro de Estudios Multi-disciplinarios de Zonas Costeras y dirección provincial de Planificación Física en Santiago de Cuba, *Cienc. en su PC* 2 (2012) 20–33 (<http://www.redalyc.org/articulo.oa?id=181324082002>).
- [22] J.A. Planas-Fajardo, J.L. Machín, T.J. Chuy-Rodríguez, Modelos y procedimientos participativos para el manejo integrado de la zona costera en el polo turístico del Parque Baconao, *Cienc. de la Tierra y el Espac.* 13 (2012) 36–53.
- [23] R.C. Macías, E.N. Jurado, J.-D.R. Sinoga, J.J.D. Peña, R.R. Noa Manejo integrado costero en Cuba, la enseña sibarimar, *Estudios De Arte, Geografía E Historia, Baética*, 2010, pp. 45–65.
- [24] C. Botero, L. Fanning, C. Milanés, J. Planas, An indicator framework for assessing progress in land and marine planning in Colombia and Cuba, *Ecol. Indic.* 64 (2016) 181–193.
- [25] R. Feinberg, *The New Cuban Economy. What Roles for Foreign Investment?* Brookings, Washington DC, 2012.
- [26] Constitución de la República de Cuba, Ministerio de Justicia, Departamento de Divulgación, Habana, Cuba, 1989, p. 22. (http://www.cubadebate.cu/wp-content/uploads/2009/06/go_x_03_2003.pdf).
- [27] Manual de legislación ambiental para la gestión de la zona costera de Cuba, in: *Ambiente MdCTyM* (Ed.), CITMA, 2008, p. 59. (http://www.edf.org/sites/default/files/9619_EDF_CubaHandbook_Spanish.pdf).
- [28] D.O. Suman, Perspectives of mangrove ecosystem management in Cuba, in: J. W. Day, A. Yañez (Eds.), *The Gulf of Mexico: Origin, Waters, and Biota*, Vol 4: Ecosystem-Based Management, 2013, pp. 399–416.
- [29] P. Milosavljev, J.M. Díaz, E. Klein, J.J. Alvarado, C. Díaz, J. Gobin, et al., Marine biodiversity in the Caribbean: regional estimates and distribution patterns, *PLoS one* 5 (2010) e11916.
- [30] D.J. Whittle, K.C. Lindeman, J.T. Tripp, International tourism and protection of Cuba's coastal and marine environments, *Tulane Environ. Law J.* 16 (2002) 533.
- [31] D.M. Olson, E. Dinerstein, The global 200: a representation approach to conserving the Earth's most biologically valuable ecoregions, *Conserv. Biol.* 12 (1998) 502–515.
- [32] N. Myers, R.A. Mittermeier, C.G. Mittermeier, G.A. Da Fonseca, J. Kent, Biodiversity hotspots for conservation priorities, *Nature* 403 (2000) 853–858.
- [33] B. Lausche, Wider Caribbean region—a pivotal time to strengthen regional instruments for biodiversity conservation, *Int. J. Mar. Coast. Law* 23 (2008) 499–530.
- [34] L.M. Burke, J. Maidens, M. Spalding, P. Kramer, E. Green, *Reefs at risk in the Caribbean*, World Resources Institute, Washington, DC, 2004.
- [35] D. Whittle, O.R. Santos, Protecting Cuba's environment: efforts to design and implement effective environmental laws and policies in Cuba, *Cuba. Stud.* 37 (2006) 73–103.
- [36] I. Nagelkerken, S. Blaber, S. Bouillon, P. Green, M. Haywood, L. Kirton, et al., The habitat function of mangroves for terrestrial and marine fauna: a review, *Aquat. Bot.* 89 (2008) 155–185.
- [37] National Environmental Strategy 2007–2010, Ministry of Science Technology and Environment, Cuba, CITMA, 2007, p. 71. (http://www.edf.org/sites/default/files/9623Cuba_Enviro_Strategy_2007-2010.pdf).
- [38] Estrategia Ambiental Nacional 2011–2015, Ministerio de Ciencia Tecnología y Medio Ambiente, Cuba, CITMA, 2011. (http://www.pnuma.org/educamb/reunion_ptosfocales_CostaRica/Cuestionarios_Politiclas/Politiclas/CUBA.pdf).
- [39] J.A.C. Hernández, G.G. Montero, O.R. Santos, P.M. Alcolado, R.P. de los Reyes, J. M. Martínez, et al., El manejo integrado costero en Cuba: un camino, grandes retos, *Manejo Costero Integrado y Política Pública em Iberoamérica*, Un diagnóstico Necesidad de cambio Cádiz, Red IBERMAR (CYTED), Espanha, 2009, pp. 91–120.
- [40] H. Caballero, S. González-Ferrer, D. Cobián, S. Álvarez, P. Alcolado-Prieto, Evaluación AGRRA del bentos en diez sitios de buceo de “María la Gorda”, Bahía de Corrientes, Cuba, *Rev Invest.* 28, March 2007, pp. 131–138.
- [41] P.M. Alcolado, R. Claro-Madruga, B. Martínez-Daranas, G. Menéndez-Macia, P. García-Parrado, K. Cantelar, et al., Evaluación ecológica de los arrecifes coralinos del oeste de Cayo Largo del Sur, Cuba: 1998–1999, *Boletín de Investigaciones Marinas y Costeras-INVEMAR*, 2001, pp. 109–132. (http://www.scielo.org.co/scielo.php?pid=S0122-97612001000100006&script=sci_arttext).
- [42] J. Baisre, S. Booth, D. Zeller, Cuban fisheries catches within FAO area 31 (Western Central Atlantic): 1950–1999, *Fisheries Centre Research Reports*, 11, 2003, pp. 133–139.
- [43] A. Widén, M.C. Öhman, Coastal resource management in Cuba, *Ambio* 27 (1998) 766–768.
- [44] S. Doyon, Transformations and adaptations in Cuban fisheries, *Marit. Stud.* 6 (2007) 83–108.
- [45] R. Puga, R. Piñeiro, N. Capetillo, M.E. de León, L. Cobas, Estado de la pesquería de langosta espinosa (*Panulirus argus*) y su relación con factores ambientales y antrópicos en Cuba, Informe de Caso de Estudio del Programa: PNCT: Los cambios Globales y la Evolución del Medio Ambiente Cubano Proyecto: Bases Oceanográficas para el estudio de las afectaciones del cambio global en la biodiversidad marina y costera de Cuba Tarea: Evaluación de las posibles afectaciones del Cambio Climático a la Biodiversidad Marina y Costera de Cuba Havana: Centro de Investigaciones Pesqueras, La Habana, Septiembre de 2008, p. 161.
- [46] N. Ehrhardt, R. Puga, M.I. Butler, Implications of the ecosystem approach to fisheries management in large Ecosystems, in: L. Fanning, R. Mahon, P. McConney (Eds.), *Towards Marine Ecosystem-based Management in the Wider Caribbean*, Amsterdam University Press, Amsterdam, 2011.
- [47] I. Cruz, R.J. McLaughlin, Contrasting marine policies in the United States, Mexico, Cuba and the European Union: Searching for an integrated strategy for the Gulf of Mexico region, *Ocean Coast. Manag.* 51 (2008) 826–838.
- [48] C. Milanés Batista, C. Botero Saltares, P. Arenas Granados, J. Alfredo Cabrera, Integrated coastal management in Cuba and Colombia: a comparative analysis, *Ocean Yearb. Online* 28 (2014) 672–697.
- [49] J.A. Suárez, P.A. Beatón, R.F. Escalona, O.P. Montero, Energy, environment and development in Cuba, *Renew. Sustain. Energy Rev.* 16 (2012) 2724–2731.
- [50] C. Milanés-Batista, C. Botero-Saltarén, P. Arenas-Granados, J. Alfredo-Cabrera, Análisis integrado sobre gestión costera en dos países del caribe, *Cienc. en su PC* (2012) 1–19.
- [51] N. Matos, Cuba Frente a Los Retos del Manejo Integrado de Zonas Costeras, *Santiago*, 98, 2007, pp. 152–162. (<http://www.eumed.net/libros-gratis/2009a/471/>).
- [52] Decreto Ley Numero 212 Gestion de Zonas Costeras [Decree Law Number 212 Coastal Zone Managment], *Gaceta Oficial de la Republica de Cuba [Official Gazette of the Republic of Cuba]*, Cuba, 14 de Agosto de 2000, p. 1373–1378. (<http://www.gacetaoficial.cu/>).
- [53] A. Underdal, Integrated marine policy: what? Why? How? *Mar. Policy* 4 (1980) 159–169.
- [54] Y. García, La Conformación de una base teórica jurídica para legislar sobre Manejo Integrado de Zonas Costeras en Cuba, *Estudio Bahía de Cienfuegos Universidad de Cienfuegos*, 2009. (<http://www.eumed.net/libros-gratis/2009a/471/>).
- [55] J.M.P. Fraga, D.G. Caraballo, I.H. Sosa, Z.G.A. Gutiérrez, D.F. Archer, Integrated coastal management program in the coastal village of Playa Florida and surrounding areas, Camagüey, Cuba, *Int. J. Mar. Sci.* 4 (2014).
- [56] J.A. Planas-Fajardo, C.M. Batista, L.M. Fanning, C.M. Botero, Validating governance performance indicators for integrated coastal and ocean management in the southeast region of Cuba, *Open. J. Mar. Sci.* 6 (2016) 49, <http://dx.doi.org/10.4236/ojms.2016.61006>.
- [57] C. Milanés-Batista, Análisis metodológico comparado del ordenamiento territorial bajo los enfoques de la gestión integrada de costas en Cuba, *Cienc. en su PC* (2011) 1–18.
- [58] J. McKenna, A. Cooper, A.M. O'Hagan, Managing by principle: a critical analysis of the European principles of integrated coastal zone management (ICZM), *Mar. Policy* 32 (2008) 941–955.
- [59] M. Zequeira-Corzo, A. Rodríguez-Cuellar, A. Cabrera-Hernández, La percepción socioambiental de la gestión costera integrada en el municipio Cárdenas Una situación crítica y los retos para el 2014, *Filial De Ciencias Médicas “Gabriela Áreas”, Matanzas, Cuba*, 2014, p. 12. (<http://www.atenas.inf.cu/index.php/comision-de-ciencias-sociales/>).
- [60] O. Perez, N. Rodriguez, M.E. Castellanos, B. Diaz, El contexto sociopolítico en Cuba: voluntad política y capacidad institucional para la implementación de programas de manejo integrado de zonas costeras, in: P. González-Díaz (Ed.), *Manejo Integrado de Zonas Costeras en Cuba Estado actual, retos y desafíos*, Imagen Contemporánea ed, Casa de Altos Estudios Don Fernando Ortiz, Universidad de La Habana, La Habana, 2015, p. 244.
- [61] C.M. Mason, L. Lim-Camacho, K. Scheepers, J.M. Parr, Testing the water: understanding stakeholder readiness for strategic coastal and marine management, *Ocean Coast. Manag.* 104 (2015) 45–56.
- [62] J.L. Rodríguez, The frontier of change in the Cuban economy, *Lat. Am. Perspect.* 41 (2014) 64–73.
- [63] R. Hernández, J. Dominguez, *Updating the Model: Balance and Perspectives of Socialist Transitions*, Center for Latin American Studies, University of Harvard, Cambridge, MA, 2013.
- [64] A.K. Ortiz, Cuba's new foreign investment law number 118: can tax incentives

- buy foreign investors' trust and be justified in increasing FDI, *Law Bus. Rev. Am.* 21 (2015) 169.
- [65] Ley de Inversion Extranjera Numero 118 [Foreign Investment Law Number 118], in: Md. Justicia (Ed.), *Gaceta Oficial de la Republica de Cuba* [Official Gazette of the Republic of Cuba], Cuba, 29 de Marzo de 2014, p. 177–240. (<http://www.gacetaoficial.cu/>).
- [66] D. Boyer, Obama Tells Cubans He Wants to End U.S. Embargo, *The Washington Times*, March 22, 2016. (<http://www.washingtontimes.com/news/2016/mar/22/obama-tells-cubans-he-wants-end-us-embargo/?page=all>).
- [67] L. Tabet, L. Fanning, Integrated coastal zone management under authoritarian rule: an evaluation framework of coastal governance in Egypt, *Ocean Coast. Manag.* 61 (2012) 1–9.
- [68] J. Areizaga, M. Sano, R. Medina, J. Juanes, A methodological approach to evaluate progress and public participation in ICZM: the case of the Cantabria Region, Spain, *Ocean Coast. Manag.* 59 (2012) 63–76.
- [69] T. Stojanovic, R.C. Ballinger, C.S. Lalwani, Successful integrated coastal management: measuring it with research and contributing to wise practice, *Ocean Coast. Manag.* 47 (2004) 273–298.
- [70] S.G. Kim, The impact of institutional arrangement on ocean governance: international trends and the case of Korea, *Ocean Coast. Manag.* 64 (2012) 47–55.
- [71] J. Wielgus, S. Poon, E.C. del Río, D. Muñoz, D. Whittle, R. Fujita, Fishery co-operatives in Cuba: potential benefits, legal feasibility, and governance pre-conditions, *Mar. Policy* 45 (2014) 128–137 (<http://www.sciencedirect.com/science/article/pii/S0308597X13002789>).
- [72] P. González-Díaz, Manejo Integrado de Zonas Costeras en Cuba, Estado actual, retos y desafíos, Casa de Altos Estudios Don Fernando Ortiz, Universidad de La Habana, La Habana, 2015.
- [73] F. Pina Amargos, J. Angulo Valdes, M. Abad Salazar, Sistema de areas protegidas relacionadas con el manejo integrado de zona costera, in: P. González-Díaz (Ed.), Manejo Integrado de Zonas Costeras en Cuba, Estado actual, retos y desafíos, Casa de Altos Estudios Don Fernando Ortiz, Universidad de La Habana, La Habana, 2015.