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# Integrated Coastal Zone Management and its potential application to Antigua and Barbuda

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ABSTRACT

Coastal resources are an essential asset for many nations, particularly small island nations, whose dependency upon coastal resources is especially high. Antigua and Barbuda has a population of approximately 85,000, of which a high percentage either resides at or engages in business along the coast. With fishing and tourism being key economic sectors, there is a high dependency on a healthy coastal environment. Here we investigated current coastal management in Antigua and Barbuda. We conducted an extensive survey of local stakeholders and reviewed lessons learned from similar island nations. We found that many activities in Antigua and Barbuda are currently being conducted unsustainably, with negative impacts on the coastal environment. The current sectorial-based management approach is disjointed, top-down, involves inadequate stakeholder participation, and is poorly enforced. However, all stakeholders surveyed expressed a willingness to participate and were keen for a more inclusive, holistic management approach. We present suggestions for Integrated Coastal Zone Management (ICZM) in Antigua and Barbuda and proposed a six-step implementation processes. A successful approach needs to be government-led but with willing and committed participation of stakeholders. A review of the current legal framework and sustainable financing are necessary pre-requisites for any ICZM, but particularly small island nations.



## 1. Introduction

Coastal environments support an array of ecosystems with significant value environmentally, aesthetically and economically (Ray and McCormick-Ray, 2004). The resources provided by these systems are essential assets for many nations, but especially small island nations who have a particularly high dependency upon them (Albuquerque and McElroy, 1992; Douglas, 2006). As a result of the many resources found within them, coastal areas are subject to a multitude of uses, including: navigation and communication, fisheries, aquaculture, tourism and recreation, provision of mineral and energy resources, infrastructure and habitation. Upland activities can also have substantial impacts on the coastal environment (Heyman and Kjerfve, 1999). These various uses affect the coast and its resources and may at times cause conflicts as a result of competition for coastal space, adverse effects of one use on another, and adverse effects on ecosystems (Cicin-Sain and Knecht, 1998). An integrated management approach is necessary to ensure efficient resource use, alleviate conflicts between users and protect the coastal environment (Ehler, 2003; Yates et al., 2013).

Integrated coastal zone management (ICZM) is often advocated as a means of achieving a sustainable coastline. ICZM involves an ongoing integrated approach to planning and management where all sectors, policies and individuals are taken into account. ICZM should address socio-cultural, economic and environmental sustainability and thus it may be implemented in many different forms. ICZM has been described as “a dynamic and continuous process of administering the use, development, and protection of the coastal zone and its resources towards common objectives of national and local authorities and the aspiration of different resource user groups” (Knecht and Archer, 1993). All definitions

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involve integration on all levels: intersectoral, intergovernmental, spatial, and scientific, and this requires coordination among various stakeholders to achieve long-term socio-economic outcomes (Cicin-Sain and Knecht, 1998).

Essential for the development of an effective integrated management approach is the adequate incorporation of stakeholders from the outset. Involving stakeholders can facilitate generation of information that may not have otherwise been available and enable the early discovery of existing or potential conflicts (Silvano and Valbo-Jorgensen, 2008; Yates, 2014). This information can be incorporated into the decision-making process and enhances planners' abilities to find the most efficient solutions. Indeed, stakeholder involvement has been shown to result in better environmental decisions (Brody, 2003) and reduce the cost of planning solutions (Yates and Schoeman, 2014).

Here we investigate the coastal issues facing the small Caribbean island state of Antigua and Barbuda, in the context of contemporary management approaches. We conduct a series of interviews with local stakeholders and review approaches to ICZM in other similar developing island nations. We discuss lessons learnt and use the results to suggest an appropriate ICZM model for Antigua and Barbuda.

### 1.1. Study site

Antigua and Barbuda is a twin-island sovereign state located in the Leeward Islands of the Caribbean (Fig. 1). The country enjoys a high standard of living, though the economy is fragile and vulnerable to social and environmental issues (Gore-Francis, 2010). There is a high level of economic dependency on the coast; the two major economic activities, tourism and fishing, rely on a healthy coastal environment. In many instances, developments and activities to facilitate these sectors have themselves caused degradation (Gore-Francis, 2010).

Sitting on the Barbuda Bank, an extensive underwater platform, Antigua and Barbuda has an Exclusive Economic Zone (EEZ) of 110,071 km$^2$. The coast of both islands contain 365 beaches, lagoons, 3% of land made up of mangroves and wetland systems, coral reef systems, offshore coral islands, algae beds, and rocky shores (Horsford, 2011). These features are primarily owned and managed by the Government. Four Marine Protected Areas (MPAs) have been established in Antigua, totaling in size of 15,038.87 ha, and two in Barbuda, totaling in size of 2701.81 ha, within the last fifteen years.

The rich marine biodiversity supplies a number of resource users. These include fisher folk, tourism stakeholders, local communities and industrial users. There is a vibrant fishing industry accounting for 2% of the national GDP. In 2010, there were 944 fishers in Antigua while in Barbuda, one in every four persons were dependent on fishing (Horsford, 2011). Island inhabitants consume 101.4 pounds of fish per capita per year and the remainder is exported to mainly the French Caribbean region (Horsford, 2011).

The tourism industry in Antigua accounts for over 70% of GDP. Hence, it is the country's main economic earner and supplies direct and indirect employment for a large percentage of the population (Tourism Travel and Transport Council International, 2007). Tourism development and activities in Antigua and Barbuda are mainly concentrated along the coastline and are vulnerable to changes in the coastal area from human activity and/or natural processes.

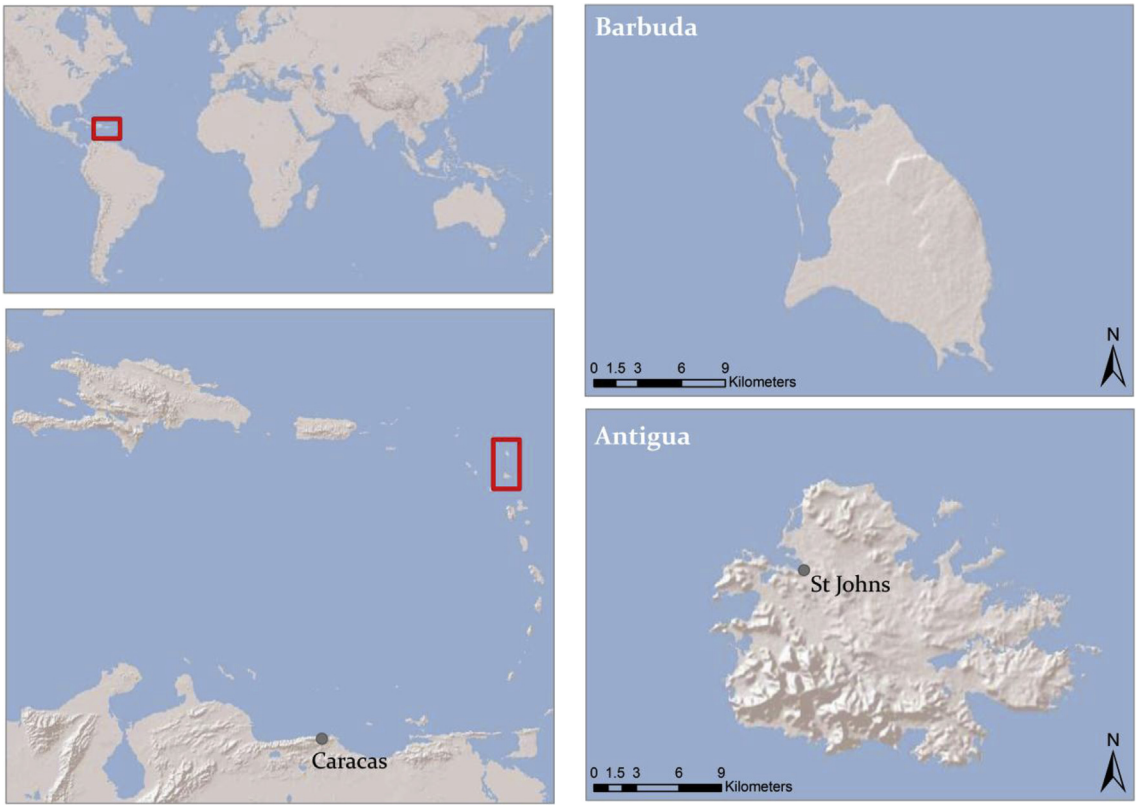


**Fig. 1.** Location of Antigua and Barbuda.