



## Coastal management in Mexico: Improvements after the marine and coastal policy publication



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### ABSTRACT

Despite the extent of the coastal line and the important heritage of Mexico, it was not until 2006 that the "National Environmental Policy for the Sustainable Development of Oceans and Coasts of Mexico" (NPOCM) was presented, and a formal revision was approved in 2011. After three years of its approval, it is convenient to identify the coastal problematic advancement and the progress of Integrated Coastal Zone Management (ICZM) to address them. A combination of three methodologies was used: (i) the "Global Environmental Outlook" methodology to identify driving forces and pressures, and to establish the coastal environmental state and the impacts in coastal populations; (ii) an exploratory survey to experts in coastal management was distributed by e-mail among the members of the "Mexican Network of Coastal-Marine Management" as well as key people and NGOs members; and (iii) the Decalogue methodology to analyze the government responses as the key issues in the State Public Administration. Far from being included and incorporated into the political agenda, the ICZM is still in an early stage of execution. The main problems identified are the lack of political will; poor cooperation between different government institutions; absence of monitoring programs; and the lack of allocation of financial resources in ICZM.

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### 1. Introduction

Mexico has a privileged geographical location positioned strategically between the two largest oceans of the planet. The country has an Exclusive Economic Zone (EEZ) of 3,149,920 km<sup>2</sup> including the Territorial Sea (231,813 km<sup>2</sup>) which is larger than its continental area (1,959,248 km<sup>2</sup>); and a coastal line extension of 11,220 km which gives a *Littorality index*<sup>1</sup> of 2.23, considered as a medium value. The country is placed in the 5th place amongst the countries, in the American continent, with a bigger EEZ extension and the 19th Latin-American country because of its *Littorality index* (SEMARNAT, 2012a; Barragán, 2012).

The vast extension of its coastal heritage in addition with the ecosystem diversity has led that this space be of a great importance

for the coastal populations and for the economic development of the country. However, the indiscriminate increase of economic activities on the coast, combined with the lack of a coastal policy, discretion in the application of current regulations and the lack of institutional capacity, has resulted in an increasing degradation of coastal ecosystems and its ecosystem services.

As a background, Mexico is a contracting party of the Earth Summit, and after the ratification of the Rio Convention in 1992 has developed some initiatives, which mainly address the development of policy instruments including national strategies for the coastal zone protection; nevertheless the absence of a Marine and Coastal Policy was still an issue to address.

However it was not until 2007 that, after scientists and experts urge, during the presentation of the "National Strategy for Ecological and Territorial Planning of Oceans and Coasts" (NSETPOC), that the former President Felipe Calderon Hinojosa, demanded the creation of an Inter-ministerial Commission for oceans and coasts to address the problems that take place in this important zone.

At the same time it was presented the first coastal policy draft "National environmental policy for the sustainable development of the oceans and coasts of Mexico", that after five years of revisions and

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<sup>1</sup> The Littorality index:  $\text{Log}_{10}(\text{Continental Surface (km}^2\text{)})/\text{Coastal line (km)}$ :  $\leq 1$  Very high;  $1 < \text{or } \leq 2$  High;  $2 < \text{or } \leq 3$  Medium;  $3 < \text{or } \leq 4$  Low; and  $> 4$  Very low (Barragán, 2012).

public consultation, was approved for publication in different media with the official name of “National Policy of oceans and coasts of Mexico” (NPOCM) ([Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas, 2012](#)).

The NPOCM have three general objectives that seeks the 1) improvement of life conditions of the coastal inhabitants though the sustainable development of coastal-marine resources; 2) to strengthen local economies, improving regional competitiveness and contribute to the national, incentivizing economic and productive activities liable to coastal-marine environments; and 3) ensure that the structure and function of coastal-marine ecosystems do not suffer irreversible alterations, recover their resilience and maintain or increase the goods and services provided. To achieve these objectives the policy considers the integral and sustainable coastal and ocean management for maintaining and restoring the natural wealth of these regions ([SEMARNAT, 2012a](#)).

The present study will focus in the improvement of the Integrated Coastal Zone Management (ICZM) in Mexico which after three years of its policy publication it is important to analyze the progress and evolution of ICZM, in order to identify gaps that need to be reduced and propose some actions in order to include ICZM in the national agenda as it is established in the NPOCM.

Due to the complexity of the coastal zone and the ICZM process, it is important to identify the underlying causes of the factual problem and a constant monitoring in its implementation. To accomplish this, different authors have designed and proposed methodologies that help to attend this complexity. The Global Environmental Outlook (GEO) uses an integrated methodology that identifies the main Driving Forces influencing the Pressures that affect and determine the State and Trends of the environment and the Impacts of the environmental state within ecosystem services and human welfare. It also highlights that responses should be considered to address the drivers of change and the environmental problems themselves, and the importance of effective responses at all administrative levels ([PNUMA, 2003](#); [PNUMA, 2004a](#); [UNEP, 2007](#); [UNEP, 2012](#)).

The GEO methodology combined with the *Decalogue* proposed by [Barragán \(1997, 2010\)](#) in the analysis of the government responses will reinforce the expected results. The *Decalogue* methodology has been broadly used in different countries (Spain, Portugal and in Latin America) as an exercise to obtain a diagnosis ([Barragán, 2009](#)) to propose an integrated coastal management public policy ([Barragán, 2012](#)). The *Decalogue* analyzes ten aspects within the implementation of the ICZM from the perspective of the State Public Administration (SPA) which includes: Policy, Regulations, Institutions, Coordination and cooperation, Strategies, Instruments, Administrators, Resources, Information and Public participation ([Arenas-Granados, 2012](#)).

## 2. Materials and methods

This section describes the methodology that we used to carry out the present study. The analysis was divided into three sections. The first part consisted in establishing a diagnosis of the coastal zone with a hypothetical-deductive methodology in a time horizon of 18 years, from 1995 to 2012, where three presidential federal administrations, of six years each, were included. In this period a political change occurred, the “Partido Revolucionario Institucional” (PRI), which had been in Mexico’s administration for 71 years, was succeeded in 2001 by the “Partido Accion Nacional” (PAN), which remained in the power for two periods of administration. This 12-year period helped to identify social, decision-making and environmental trends and changes in Mexico.

We used the GEO methodology due to its integrated approach, ideal for a better understanding of resource management for

coastal areas. The driving forces were identified (scientific and technological innovation, political, institutional and social models, demography and economic development patterns, and distribution processes within and between generations); as well as pressures in the coastal zones (generally by human intervention: resource exploitation, pollution and human activities. With these two elements (drivers and pressures), and based on actual studies, the state and trends of the coastal zone ecosystems were established. Then the Millennium Ecosystem Assessment ([Millennium Ecosystems Assessment, 2003](#)) and the Marine and coastal ecosystems and human well-being ([UNEP, 2006](#)) approaches were used to identify the impacts associated with the environmental conditions in coastal communities and human well-being.

Also we analyze relevant literature from environmental, economic and social studies from government institutions, non-governmental organizations and research institutions.

For the last stage of the GEO methodology (Responses) was complemented by the *Decalogue* methodology ([Barragán, 1997](#)) and the key elements analyzed were: Policy, Legal framework, Institutions, Strategies, Instruments, Managers training, Knowledge and research; Economical resources; Education for sustainability; and Public participation.

After the recognition of the successive stage, for each key issue, we used the valuation criteria proposed by [Arenas-Granados \(2012\)](#). The total valuation sum from the comparative analysis of the ten key issues in the SPA indicate us the progress in ICZM.

An exploratory survey was conducted to experts on coastal management in Mexico with the objective to complement and validate the coastal zone state and the progress of ICZM in Mexico. The survey was distributed by email among members of the “Mexican Network of Coastal-Marine Management”, using a simple random sampling. This survey was also sent to key experts from government institutions and non-governmental organizations. Participants were asked for their cooperation to disseminate among staff and researchers whose participation was relevant.

The survey was designed in order to identify the next aspects: i) years of respondents experience, ii) perception of ICZM and the main problems identified in the region where they worked, iii) existence of ICZM programs to address coastal problems, and iv) progress in the ICZM programs and gaps for its implementation.

## 3. Results and discussion

Results are presented regarding the components of the GEO methodology as follows:

### 3.1. Driving Forces

Driving forces are described by the GEO report ([UNEP, 2007](#)) as the social processes that influence coastal activities that impact directly and/or indirectly on coastal environments and people.

#### a) Demography

The population settling along the coastal zone of Mexico is continuously growing. In the coastal states the population had an increase of the 39% in the last 20 years. In 2010, 46.2% of the population lived in the coastal zone and there were 26 coastal cities with a population over 100 thousand people ([Fig. 1](#)) ([Azuz-Adeath and Rivera-Arriaga, 2004](#); [INEGI, 2010](#)). In previous decades the population located in the northern and southern borders were sparsely populated, situation that have changed due to the increase of industrial, commercial and tourism activities ([INEGI, 2008](#)). Projections estimate that in 2030 there will be 60 million people living in coastal zones, with the North and South Pacific, and the

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