



Challenges of implementing integrated coastal zone management into local planning policies, a case study of Queensland, Australia[☆]



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ABSTRACT

This review traces an almost 25-year history of implementing cornerstones of integrated coastal zone management (ICZM) and climate change adaptation into the regulatory planning and decision-making in Queensland, Australia. It illustrates the seesawing changes between ICZM and the general planning policy and statutory framework to accommodate the political struggle of incorporating key climate change adaptation measures in sought after and economically important coastal areas. The result of this process is mixed. It could be best described as an almost total *integration* of ICZM *into*, rather than *with*, other legislation; and this has been accompanied by an ever-diminishing political focus on coastal management in favour of mostly project specific, generic risk and hazard assessment processes. This leaves local authorities with an even greater need of reliable and yet affordable scientific and legal tools, to effectively deal with these risks. The broader implication of the Queensland ICZM history certainly raises the question about the extent of integration that is desirable for coastal zone management, notably in conjunction with the ongoing debate about climate change adaptation. Although the State government has recently introduced a new climate change adaptation strategy and is financially supporting coastal local government in developing long-term adaptation plans, the concept of ICZM in Queensland should be revisited. In other words, there is still a need for practical approaches of implementing ICZM into existing regulatory planning, pollution control, natural resource management and biodiversity conservation frameworks.

1. Introduction

Following its international endorsement during the Rio Earth Summit in 1992 [13], the global call for improving coastal zone management is nearing its 25th anniversary. Even before that time, the concept of integrated coastal zone management (ICZM) has been widely regarded as an auspicious approach to resolve the diverging needs and interests of the complex socio-economic and environmental systems at the land-sea interface (United Nations 1972, US history of ICZM in [35]). In more recent times, the interests of governments, policy makers and researchers started to focus on the question of how to convert and implement ICZM concepts and approaches into existing governance structures and decision-making systems affecting the coastal zone [16,41,48,49,51], notably in Europe under its ICZM strategy 2000/547/EC and subsequent directives [4].

About one and a half decades ago, the increasing global recognition of the need for adaptation to climate change, particularly sea level rise

and intensifying severe weather events, asserted the need for a closer integration of policy domains [50]. Although not compared directly, ICZM and climate change adaptation were noted for their converging dimensions in their integrative approaches and pathways to adapt or implement relevant policy and legislative frameworks [24,52]. Both focus on sustainable outcomes and share a “preoccupation with integration across sectors, administrative boundaries and scales of governance, subsidiarity and participatory decision-making, and the use of adaptive governance” ([24,34], summarised in [12]).

Internationally, as well as nationally (e.g. [24]), the implementation of policies and practical measures in each of these two domains was successive rather than concurrent, with ICZM policies and legislative initiatives mostly preceding those for climate change adaptation. The impacts of climate change are certainly much broader, and adaptation to its impacts therefore encompasses industry sectors with footprints far beyond coastal areas, notably the building, agriculture, water and transport industries. Their operations have been shown to generate

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impacts that can cause social and environmental deterioration of coastal environments. Coastal communities, especially those along major rivers, form important nodes for many industries by providing the geographical settings for harbours, airports, nutrient-rich alluvial soils and access to water. In theory, therefore, a political momentum promoting climate change adaptation should support ICZM, and existing ICZM policies and legal frameworks should provide a readily transformable platform for advancing adaptation strategies. This should be even more pertinent in countries where both domains have a strong geographical overlap, i.e. countries where most of the population lives in or very close to the coastal zone and parts of this zone are particularly susceptible to the impacts of climate change.

At first, this raises the question of how to best integrate and combine these two domains within existing policy and governance frameworks. In the second instance, it is of equal importance to consider how relevant functions, responsibilities and information are to be shared and consigned across different levels of government, public or private organisations and local communities. By tracing the history of ICZM implementation into the coastal management and governance framework in the state of Queensland, Australia, this work analyses the process and outcomes of aligning ICZM with climate change adaptation. As outlined in Section 2, the State's coastline not only faces the many typical challenges associated with coastal management, it is also subject to a national (constitutional) governance regime that has left most control over its coastal areas to individual States and Territories. Being roughly 7000 km long, the coastal zone in Queensland is rather diverse regarding its socio-economic and environmental characteristics. As such, it provides a multi-faceted case study for trajectories that can emerge from combining climate change adaptation and ICZM in a growing and increasingly complex legislative and policy framework.

2. The Queensland's coastal zone

The Queensland coastline has a long history of severe weather events causing erosion, flooding and wind forces that resulted in substantial damage to urban development, transport infrastructure and ecosystems. Such weather events include tropical cyclones, storm surges and major rain events. Naturally, protection against coastal hazards constitutes an important part of ICZM, but so does nature conservation. Long sections of the Queensland coast are also part of, or adjacent to, major World Heritage areas, including the Great Barrier Reef Marine Park (GBRMP), Fraser Island and the Queensland Wet Tropics. Development in such areas of internationally recognised natural heritage values can trigger the requirement for assessment under Federal legislation [22].

Many of the east-facing sections of the State's coastline are also lined with several protected areas under Queensland State legislation. Because of these natural amenities, and despite the vulnerability of its coastal zone, 2.5 Million people (53% of the State's total population) resided within or immediately adjacent to the coastal zone.² Population densities in this area were also highly variable (2016 ± 2827 persons per km² (mean \pm 1 sd.)) as result of concentrated urban and regional development in a handful locations, such as Southeast Queensland (Fig. 1), Rockhampton and Cairns. Much of the remaining parts of the coastal zone had population densities of < 10 persons per km² (Fig. 1). Over the past five years, population growth rates were on average highest at just below 2% in census districts intersecting the coastal zone and negative in most inland areas¹.

Land clearing and subsequent agricultural use, notably sugar cane farming, has been identified as major factors that increased sediment runoff and nutrient, herbicide and pesticide import into most QLD coastal areas. These inputs had demonstrated detrimental effects on the health of coastal ecosystems, i.e. coral reefs [18,23,34,37] and seagrass [1,10,11].

Initial impacts predicted for climate change have started to become apparent in many parts of the Queensland coastline. These include increased coral bleaching and seawater acidification along the Great Barrier Reef due to higher atmospheric CO₂ levels and increasing sea surface temperatures [31,5,54,55], changes in saltmarsh and mangrove distribution possibly due to sea level rise [3,47,54] and major destruction of housing and transport infrastructure resulting from a series of major tropical cyclones and storms [6].

It is these major regional and local differences as well as the legislatively limited, yet important, overlap between Federal and State interests in the coastal zone that generate a challenging task for integrating ICZM with climate change adaptation.

3. Coastal management initiatives at the Federal Government level

Coastal waters out to three nautical miles from the coastline or specific closing lines that delineate bays, gulfs estuaries, etc. are controlled by State and Territory governments.³ The only exemptions are private or public developments that “are likely to have a significant effect on the values of a matter of national environmental significance”.⁴ These include, inter alia, World Heritage values and conservation values included in the Federal GBRMP zoning plan, which trigger the need for approval by the Federal Minister for the Environment.

Despite these constraints, it was the Australian Federal Government that was the first to recognize the vulnerability of coastal areas under its [15]. This policy was intended to provide an overarching national approach to coastal zone management. The document outlined the Federal Government's position on coastal management matters and identified initiatives that the Government would take to help improve the management of the coastal zone [15,30].

The Commonwealth Coastal Policy was short-lived. Instead, coastal zone management (CZM) initiatives were developed under various natural resource management (NRM) programs funded by the National Heritage Trust (NHT) I, NHT II, and later ‘Caring for our Country’ frameworks (for details see [28]) up to their latest incarnation, the ‘National Landcare Programme’. A key outcome of these initiatives was the establishment of a network of regional NRM groups for each major catchment under bilateral agreements between the Federal and State Governments [28]. In Queensland, these arrangements generated a layer of non-statutory regional bodies to (a) develop stakeholder-informed catchment management plans and (b) better coordinate on-ground activities, including ICZM programs. Further transformations were fueled by mounting scientific evidence that highlighted land use changes across coastal catchments as a major driver of coastal impacts. In response, the focus of Federal NRM initiatives shifted away from the coastal zone per se to more integrated catchment management programs, with regional focus.

Under these circumstances, individual States and Territories were left with the task of developing respective regulatory frameworks for coastal zone management. It is these frameworks, and their relevant policies and statutory instruments that guide and inform local governments when exercising their planning and management controls in coastal areas [30,38,56,7].

4. History of coastal management in Queensland

The Queensland Government introduced its first holistic piece of coastal management legislation along with the Commonwealth Coastal Policy in 1995, the Coastal Protection and Management Act 1995 (the Coastal Act).

³ Commonwealth Australia Constitution Act 1900 (Cth), *Seas and Submerged Lands Act* 1973 (Cth).

⁴ ss.67, 75 *Environmental Protection (Biodiversity Conservation) Act* 1999 (Cth).

² 2016 and 2011 census available online from the Australian Bureau of Statistics.

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