

## *Environment and Coastal Management*

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### **Challenges and Opportunities for Integrated Coastal Management in Uruguay**

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#### **INTRODUCTION**

As an ecotone, the global coastal zone is an area of intense ecological and social interaction. It provides relevant ecosystem services to 60 percent of the human population, even though it represents approximately 10 percent of the planet's surface.<sup>1</sup> Demands for space and resources are increasing exponentially. Conflicting interests and competing demands generate trade-offs between conservation and development.<sup>2</sup> Although local, regional and international efforts over the past few decades have generated tools, rules and principles to implement Integrated Coastal Management (ICM), numerous, diverse difficulties have delayed major achievements by these programs. For example, success is commonly judged over a medium-to-long time interval, which is often incompatible with short-term political agendas. Although some examples do exist of successful long-term ICM implementa-

1. R. Costanza, R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R.V. O'Neill, J. Paruelo, R.G. Raskin, P. Sutton and M. van den Belt, "The Value of the World's Ecosystem Services and Natural Capital," *Nature* 387 (1999): 253–260; K.K. Liu, K. Iseki and S.Y. Chao, "Continental Margin Carbon fluxes," in *The Changing Ocean Carbon Cycle*, ed. R.B. Hanson, H.W. Ducklow and J.C. Field (Cambridge: Cambridge University Press, 2000), pp. 187–239.

2. Intergovernmental Panel on Climate Change (IPCC) "Preparing to Meet the Coastal Challenges for the 21st Century," Conference report, World Coast Conference 1993 (Noordwijk: UNEP/WMO, 1994), 109 pp.

*Ocean Yearbook* 23: 403–432.

tions in the international arena, these only represent a small percentage of the close to 700 ICM efforts registered worldwide.<sup>3</sup>

The subtropical and temperate Atlantic Ocean, along much of the coast of South America, is diverse, rich and stunning, providing many diverse habitats, e.g., mangroves, sand dunes, estuaries, coral reefs and wetlands. These coastal ecosystems receive freshwater from large, heavily populated watersheds, which offer substantial risks for coastal degradation.<sup>4</sup> Despite the social and economic importance of this coastal zone, it is not yet well managed relative to other coastal regions.<sup>5</sup> Although advances differ from country to country, an exceptional opportunity exists because of the relatively homogenous culture of the continent at a regional level, despite the recognition of greater diversity at a local level. This could greatly facilitate regional cooperation with integrated initiatives, hopefully leading towards a Latin-American ICM model.<sup>6</sup>

### **The Urgency of an Integrated Approach to Solve Coastal Problems**

Problems associated with fisheries, pollution and poverty interweave and magnify use/user conflicts, hindering possibilities for coastal communities to satisfy their economic, social and basic needs. Therefore, integrated coastal management and poverty alleviation start to connect, for it is impossible to achieve the objectives of sustainable development without healthy and productive coastal ecosystems.

Even though the “sustainable management of coastal resources” is a common catch phrase used by managers and politicians, in practice this has not been the case. Sustainable management would not only permit continuity in current economic activities, but it would also allow the development of new activities, resulting from improved usage, contemplating the conservation of coastal resources and improved environmental conditions in general.

3. J. Sorensen, “Baseline 2000: Background Report—The Status of Integrated Coastal Management as an International Practice,” Second Iteration, 26 August 2002, 167 pp., available online: <<http://www.uhi.umb.edu/b2k/baseline2000.pdf>>.

4. U. Seeliger and C. Odebrecht, “Introducao e aspectos gerais,” in *Os ecossistema costeiro e marinho do extremo sul do Brasil*, ed. U. Seeliger, C. Odebrecht and J.P. Castello (Rio Grande: Editora Ecocientia, 1998), pp. 1–4.

5. J. Sorensen and A. Brandani, “An Overview of Coastal Management in Latin America,” *Coastal Management* 15 (1987): 1–25; A. Yañez-Arancibia, “Terms of Reference Towards Coastal Management and Sustainable Development in Latin America: Introduction to Special Issue on Progress and Experiences,” *Ocean and Coastal Management* 42, no. 2-4 (1999): 77–104.

6. J.M. Barragán Muñoz, “The Coasts of Latin America at the End of the Century,” *Journal of Coastal Research* 17, 4 (2001): 885–899.

The objective of this article is to review past and present management, research and capacity building efforts along the Uruguayan coastal zone, while also attempting to assess future challenges and potential weaknesses for the implementation of Integrated Coastal Management (ICM).

## **DESCRIPTION AND ENVIRONMENTAL CONDITION OF THE URUGUAYAN COAST**

The Uruguayan coast is intimately linked with one of the world's great estuaries, the Río de la Plata, with a surface area of more than 38,800 km<sup>2</sup>. The Río de la Plata is fed by two important rivers, the Uruguay and the Parana, which have a collective average flow rate of 20,000 m<sup>3</sup>/second. Those rivers draw water from a large and complex basin, with ranges of latitude 14–37° S and longitude 43–67° W, and more than 3,170,000 km<sup>2</sup> extending over five countries and containing 65 million inhabitants and several large cities. The incoming freshwater mixes with seawater producing strong physical and chemical gradients that in turn create a dynamic and biologically unique system.<sup>7</sup> This complexity is further enhanced when one considers that the confluence, created by the collision of the southward flowing Brazil current with the northward flowing Malvinas current, occurs on the continental shelf adjacent to the Río de la Plata. The northern coast of this system is geologically associated with the Brazilian Shield.

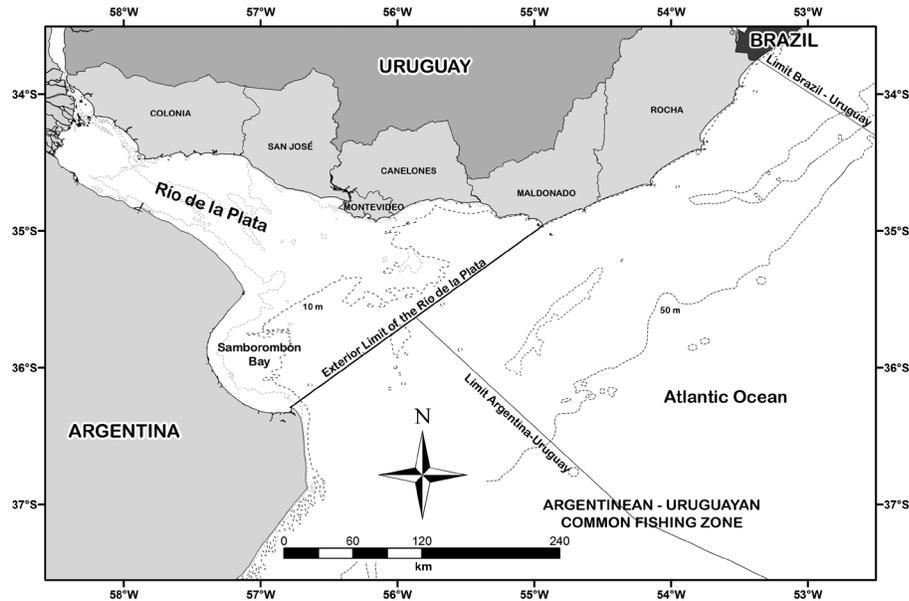
The Uruguayan coastal zone extends roughly 700 km from Colonia, on the inner part of the Río de la Plata, eastward to Rocha, which is on the Atlantic coast and abuts the border with Brazil (Figure 1).

Due to Uruguay's small size the ratio of coastline length to the surface area of the country is greater than its immediate neighbors. This fact highlights the importance of the coastal zone to the nation's economy. Although the six coastal municipalities of Uruguay (Colonia, San Jose, Montevideo, Canelones, Maldonado and Rocha) account for less than 18 percent of the country's area, they collectively contain 2,244,000 people, or approximately 70 percent of Uruguay's population. These six municipalities also contain a significant amount of the country's economic activities, accounting for approximately 76 percent of its gross domestic product (GDP). According to Gorfinkiel and Garibotto,<sup>8</sup> income generated from

7. C. Martínez and R. Fournier, "EcoPlata: An Uruguayan Multi-Institutional Approach to Integrated Coastal Zone Management," *Ocean and Coastal Management* 42 (1999): 165–185.

8. D. Gorfinkiel and S. Garibotto, *Una Aproximación al dimensionamiento económico y social de las actividades vinculadas al uso de los recursos acuáticos del Río de la Plata y su Frente Marítimo*, Convenio ECOPLATA—Freplata, Informe de Trabajo, Febrero 2002.

FIG. 1.—Map of the Uruguayan coastal zone, showing the six coastal municipalities of Colonia, San Jose, Montevideo, Canelones, Maldonado and Rocha.



fishing exports, tourism, port operation and maritime commerce demonstrate a close connection between Uruguay's economy and its coastal zone. In addition, urban areas and agriculture occupy 35 percent and 18 percent of the coastal zone, respectively.

The Uruguayan coastal zone is diverse and complex, encompassing territorial organization, economic activities, and social and environmental conditions. To assess that complexity, the coastal zone can be divided into two major regions, southwest and southeast, based on assessments of each for environmental conditions and socioeconomic factors.<sup>9</sup> The southwestern region accounts for 63 percent of Uruguay's population and for 69 percent of its GDP. It includes the municipalities along the Río de la Plata: Colonia, San José, Montevideo and Canelones, except for Maldonado. The capital city of Montevideo is characterized by large urban structures and the social fragmentation common to all big cities, and it alone accounts for 42 percent of Uruguay's population and 56 percent of its GDP. Urban

9. E. Gallichio, V. Cantón and J.L. Sciandro, *Estudio sinóptico: Gestión costera en Uruguay-Estado actual y perspectivas*, Informe de ECOPLATA (2004) 128 pp; E. Salas, R. Coria, G. Baranda and M. Guchin, *Prospectiva de los Espacios Costeros. Uruguay 2025: Economía, Población y Territorio*, Ciclo Nacional de Reflexión, ECOPLATA/DINOT (2005) 28 pp.

development has expanded rapidly to the east, in the direction of Canelones, which is currently experiencing considerable urban pressure and rapid environmental deterioration in some areas.

The southeastern zone contains the Atlantic coast and the easternmost portion of the Río de la Plata. It includes the two remaining coastal municipalities, Maldonado and Rocha, which together represent 6 percent of the population and 8 percent of GDP (Figure 1). Maldonado is a traditional tourist area that has experienced rapid development over the past three decades. It includes Punta del Este, a city well known internationally as a summer resort destination. Rocha is natural, relatively undeveloped with extensive agricultural activities and attracts low impact tourism. However, this is presently changing due to expansion of the Maldonado tourist model and the growing potential for large-scale industrial investments.

Recently, Uruguay's coastal zone has undergone transformation from, for example, increased economic activity, expansion of coastal infrastructure along with industrial hubs and urban centers. Industrial activities, artisanal fishing, agriculture, tourism, and maritime commerce are all highly dependent on the coastal environment, which has drawn a significant percentage of the population into this zone. This, in turn, has led to conflict between some of these uses and the emerging social and environmental crisis, which is common to coastal zones experiencing rapid development.

Environmental problems presently being faced along the Uruguayan coast are categorized according to Lemay and Avila et al.,<sup>10</sup> and include: i) those due primarily to land-use changes and their associated conflicts; ii) sectoral planning related, for example, to tourism, urbanization, port activity, industrial infrastructure and conservation, which creates competition for natural resources; iii) the discharge of large volumes of untreated agricultural, domestic and industrial effluents into vulnerable coastal ecosystems; iv) beach erosion, sand dune forestation with exotic species and illegal sand mining have significantly modified natural features of the coast; v) industrial fishing, in the absence of management plans, is responsible for overexploitation of commercial species, while illegal practices and competition with the artisanal fleet for resources has produced a significant decline in fish populations, nursery wetlands and beaches; vi) impoverished communities, highly dependent on coastal resources, use those resources in an unsustainable manner, particularly during periods of economic crisis. These problems are addressed further in selected case studies (Table 1).

10. M. Lemay, *Manejo de los recursos costeros y marinos en América Latina y el Caribe*, Informe técnico N ENV-128 (Washington, D.C.: BID, 1998); S. Ávila, D. Gorfinkiel and R. Menafra, *Estudio sinóptico: Identificación de la demanda de capacitación en gestión para el desarrollo sustentable y gobernanza de los espacios costeros*, Informe de ECOPLATA (2004) 62 pp.

The coastal zone of Uruguay undergoes considerable natural variability due to interactions between the Río de la Plata estuary, the Atlantic Ocean and additional land-water-atmosphere interactions. This coast commonly experiences strong southeasterly wind events and is repeatedly affected by severe storms that have damaged coastal facilities and caused low-land flooding. The rising number of resort areas along with the occupation of littoral areas by impoverished communities has increased the social and economic impact of these climatic events. Moreover, climate change is expected to accelerate sea-level rise and to modify the precipitation and freshwater discharge, through El Niño-Southern Oscillation (ENSO) events, into this region.<sup>11</sup> Barros et al.<sup>12</sup> ran a sensitivity analysis for the effects on mean sea level in the Río de la Plata under several scenarios of sea-level rise, freshwater discharge and wind increase. They reported that freshwater discharge by the Uruguay and Paraná rivers of 75,000 m<sup>3</sup>/second, corresponding to the largest discharge of the last century, would affect considerably the inner part of the Río de la Plata (a 0.6 m rise along the inner coast of the municipality of Colonia). This result is similar to expected sea-level rise for the next 100 years. The frequency of these large floods has increased over the last three decades. Hareau et al.<sup>13</sup> evaluated the risk of losing both capital value and infrastructure under different scenarios of sea-level rise for several coastal sectors of Uruguay. A 1 m rise, estimated using the dynamic equilibrium model, indicated that the Montevideo-Canelones and the eastern Punta del Este coastal sectors have considerably higher capital at risk per km than the rest of the coast. Estimated coastal losses are US\$342 and 992 million, respectively, while losses for the whole coast were estimated at US\$1.8 billion. In both these regions capital at risk is larger than the estimated cost of the protection options. The authors observed that while capacity at both technical and political levels does exist to address change, a major effort will be needed to develop ICM plans that include responses to climate change.

11. J.L. Genta, G. Perez and C.R. Mechoso, "A Recent Increasing Trend in the Streamflow of Rivers in Southeastern South America," *Journal of Climate* 11 (1998): 2858–2862.

12. V. Barros, I. Camilloni and A. Menendez, "Impact of Global Change on the Coastal Areas of the Rio de la Plata," *Assessments of Impacts and Adaptations to Climate Change* (IACC Notes), Volume 2, Issue 1 (June 2003), pp. 9–11.

13. A. Hareau, R. Hofstadter and A. Saizar, "Vulnerability to Climate Change in Uruguay: Potential Impacts on the Agricultural and Coastal Resource Sectors and Response Capabilities," *Climate Research* 12, no. 2-3 (1999): 185–193.

Table 1.—Specific examples of the major environmental issues presently faced by the Uruguayan coast.

Category	Type	Specific case	Description	Management efforts	Selected studies and references*
Land-use conflicts	Protected areas and conservation	Rocha Lagoon (Municipality of Rocha)	<p>In the influence area of this protected lagoon, most economic activities (artisanal fisheries, agriculture, tourism, etc.) are strongly based on ecosystem services and natural resources. However, the unplanned land-use in the basin is fostering environmental impacts such as hydrological modifications, eutrophication, urbanization and desiccation of wetlands, leading to potential losses of biodiversity, productivity and water quality. This system has an important role for research and conservation because it is the most studied aquatic environment of Uruguay and exhibits a high level of active social participation. According to a recent stakeholders mapping, there exists a strong potential towards the implementation of a management plan for the lagoon, based on a series of institutions and groups strongly associated.</p>	<p>Thirty nine national or local institutions and groups were identified as having interests or responsibilities over Rocha Lagoon, which suggests an extremely complex network of interests and conflicts. Since 2003, a multi-partner management commission (now the NGO Friends of the Lagoon) achieved various goals, including the delimitation of the protected area, support for the actions of the park ranger, installation of signs for visitors and other infrastructure, sustainable aquaculture, several activities of environmental education and scientific research, and submission of a proposal for the inclusion of the area into the new National System of Protected Areas (NSPA), which is presently being implemented. Rocha Lagoon will probably be the first area in the country with an active local administration committee of the NSPA.</p>	<p>Conde and Rodríguez-Gallego (2002) Bonilla et al. (2006) Rodríguez-Gallego (in press)</p>
	Port infrastructure	La Paloma seaside	<p>The Port of La Paloma, located in the seaside resort by the same name, is traditionally a fisheries port. This activity reached its peak in the 1980s, later declined and is stable at present. In addition, La Paloma is a consolidated tourist destination, offering attractions and services to visitors from the region, and has potential to continue growing in this</p>	<p>A group of local stakeholders have joined efforts to raise opposition to plans to industrialize the port and are urging authorities to promote tourism development instead. It is not clear what direction national or local authorities wish to take, or how they plan to harmonize opposing views. So far there are no signs of effective interaction between the</p>	<p>There are no studies characterizing this specific issue in La Paloma, but ECOPLATA is</p>

Category	Type	Specific case	Description	Management efforts	Selected studies and references*
Sectoral planning	vs. Tourism	(Municipality of Rocha)	<p>sector. During the past couple of years, announcements have been made by the media and public officials about investment projects to revitalize the Port as an industrial pole for fisheries and forestry.</p>	<p>institutions responsible for these worldwide where ports and tourism get along just fine, but only when sectoral planning is replaced by a more integrated management approach and with local stakeholders' participation. A planning process with these characteristics has not yet been implemented in La Paloma.</p>	<p>promoting efforts to conduct a study on coastal tourism in Uruguay, which could potentially use this as a case study.</p>
Water quality deterioration	Environmental degradation, habitat fragmentation, industrial effluents and solid wastes	Carrasco Stream watershed (Municipalities of Montevideo and Canelones)	<p>The Carrasco Stream watershed (205 km<sup>2</sup>) is shared by the Municipalities of Montevideo and Canelones. With a population of over 150,000, 41 percent lack sewage treatment and approximately 45,000 people live in poor conditions. The watershed contains diverse and complex social and environmental problems. The environmental degradation of the area started in the early 1940s with an intense industrial development impacting the water quality of streams. Later, the wetland area was drained and its main water courses channelled. Today the watershed still faces water quality problems, solid waste pollution, natural resources extraction, habitat fragmentation and the presence of exotic plant species. In addition, social and economic issues and land use problems are enhanced by a lack of government and institutional presence.</p>	<p>Currently, both local governments and the Ministry of Environment (MVOTMA) are combining efforts to elaborate a Strategic Integrated Management Plan for the watershed. An interdisciplinary working group is studying and characterizing the economic, social, territorial and environmental state of the area and preparing recommendations and providing the necessary information for the development of an integrated management plan.</p>	<p>Arocena (1998) IMM (2006)</p>

Category	Type	Specific case	Description	Management efforts	Selected studies and references*
Coastal erosion	Modification of river outlet	Pando Stream (Municipality of Canelones)	The outlet of the Pando Stream has suffered impacts and modifications as a result of several infrastructure projects and activities such as sand mining and sand dune de-forestation, which date back to 1930. Erosion is affecting the adjacent beaches of the seaside resort of Neptunia, as well as houses and roads along the stream's margins.	Management efforts: Specific actions have been coordinated and implemented between the Faculty of Sciences and the Municipality (local government) to stabilize and reconstruct the sand dune and beach system in Neptunia using fencing and planting techniques.	Gutiérrez and Panario (2006)
Fisheries management	Industrial vs. Artisanal	Territorial sea of Rio de la Plata and Atlantic Ocean (the whole coast)	In the estuary of the Rio de la Plata, fishing effort is concentrated on a small group of species, the most abundant of which have been declared "fully exploited" (e.g., white croaker, <i>Microgobias furnieri</i> ) and already showing signs of overexploitation. Catches of the principal species have shown a slight decline since the 1990s. Current fisheries management efforts are in need of renovation, to incorporate basic principles such as the precautionary approach, ecosystem management, resource diversification and social equality and participation.	At present, a FAO Project is being implemented through the institutional modernization of the National Directorate of Aquatic Resources (DINARA) by developing a robust management system based on modern scientific methodologies, restructuring the artisanal sector, and developing aquaculture as an alternative and with the general objective of contributing to the sustainable development of fisheries and aquaculture in Uruguay.	Norbis et al. (2006) Pin et al. (2006) Galli (2007)
Impoverished communities	Artisanal fisheries associated to illegal settlements	San Luis seaside (Municipality of Canelones)	Artisanal fishers are one of the most impoverished components of coastal communities in Uruguay. They face a complex social and economic situation resulting from a diminishing supply of fishing resources, in addition to a situation of instability and informality regarding their	In 2002-2004 ECOPLATA implemented a Pilot Project in San Luis with ample institutional participation and direct integration with local fishers. The objective was to improve the quality of life of the fishing community through the implementation of wise practices in technological, institutional and social sectors. Another goal was to bring	Hernández and Rossi (2001) Spinetti et al.

Category	Type	Specific case	Description	Management efforts	Selected studies and references*
			housing settlements. In San Luis, artisanal fishers and families have settled right on the beach, creating a coastal slum of inadequate living and environmental conditions.	the issues of the artisanal fisheries sector to the public agenda, studying and characterizing its present state, and providing a basis for the implementation of integrated management actions at a national level based on the experience at the local level.	(2001)

\* R. Arocena, "Statistical Analysis of Benthic Communities to Assess Suspected Degradation and Recuperation Zones in an Urban Stream (Uruguay)," *Verh. Internat. Verein. Limnol.* 26 (1998): 1188-1192; S. Bonilla, D. Conde, L. Aubriot, L. Rodríguez-Gallego, C. Piccini, E. Meerhoff, L. Rodríguez-Graña, D. Calliari, P. Gómez, I. Machado and A. Britos, "Procesos estructuradores de las comunidades biológicas en lagunas costeras de Uruguay," in *Bases para la conservación y el manejo de la costa uruguaya*, eds. R. Menafra, L. Rodríguez-Gallego, F. Scarabino and D. Conde (VIDA SILVESTRE URUGUAY, Montevideo, 2006), pp. 611-630; D. Conde and L. Rodríguez-Gallego, "Problemática ambiental y gestión de las lagunas costeras atlánticas de Uruguay," in *Perfil ambiental del Uruguay*, eds. A. Domínguez and R. G. Prieto (Nordan-Comunidad, Montevideo 2002), pp. 149-166; O. Galli, "La Pesca en el Uruguay: un modelo agotado," (REDES-Amigos de la Tierra, Montevideo 2007) 11 pp; O. Gutiérrez and D. Panario, "Evolución de la desembocadura del Arroyo Pando (Canelones, Uruguay): tendencias naturales o efectos antropicos?," in *Bases para la conservación y el manejo de la costa uruguaya*, eds. R. Menafra, L. Rodríguez-Gallego, F. Scarabino and D. Conde (VIDA SILVESTRE URUGUAY, Montevideo, 2006), pp. 391-400; J.M. Hernández and P. Rossi, "Caracterización de los asentamientos de pescadores artesanales en la zona frontal del Río de la Plata," in *El Río de la Plata. Investigación para la gestión del ambiente, los Recursos Pesqueros y la Pesquería en el Frente Salino* eds. D. Vizziano, P. Puig, C. Mesones and G. Nagy (Programa Ecoplata, Montevideo, 2001) pp. 217-234; Intendencia municipal de Montevideo (IMM) *Informe Ambiental de Montevideo*. Grupo Ambiental de Montevideo, 2006. <<http://www.gam.org.uy>>; W. Norbis, L. Paesch and O. Galli, "Los recursos pesqueros de la costa de Uruguay: ambiente, biología y gestión," in *Bases para la conservación y el manejo de la costa uruguaya*, eds. R. Menafra, L. Rodríguez-Gallego, F. Scarabino and D. Conde (VIDA SILVESTRE URUGUAY, Montevideo, 2006), pp. 197-209; O.D. Pin, G. Arena, E. Chiesa and P. Puig, "Abundancia, capturas y medidas de manejo del recurso corvina (Micropononias furnieri) en el Río de la Plata y Zona Común de Pesca Argentino-Uruguaya (1975-2003)," in *Bases para la conservación y el manejo de la costa uruguaya*, eds. R. Menafra, L. Rodríguez-Gallego, F. Scarabino and D. Conde (VIDA SILVESTRE URUGUAY, Montevideo, 2006), pp. 225-232; L. Rodríguez-Gallego, E. Meerhoff, L. Poersch, L. Aubriot, C. Fagetti, J. Vitancourt and D. Conde, "Establishing limits to aquaculture in a protected coastal lagoon: impact of *Farfantepenaeus paulensis* culture pens on water quality and benthic biota Aquaculture," (in press); M. Spinetti, G. Riestra, R. Foti and A. Fernández, "La actividad pesquera artesanal en el Río de la Plata: estructura y situación socioeconómica," in *El Río de la Plata. Investigación para la gestión del ambiente, los Recursos Pesqueros y la Pesquería en el Frente Salino* eds. D. Vizziano, P. Puig, C. Mesones and G. Nagy (Programa Ecoplata, Montevideo, 2001) pp. 235-271.

## **PRESENT STATE OF ICM IN URUGUAY: PRACTICE, CAPACITY-BUILDING AND RESEARCH**

### **Policy and Institutional Framework**

Uruguay has a broad and diffuse coastal legal regime composed of norms of different strength, e.g., laws, decrees, treaties and administrative acts, which have not been unified into an organized legal text. Diverse legislation exists related to the coastal zone at local (municipality) and national levels that are focused mainly on the management of a particular sector or resource, and therefore lack an integrated approach to coastal resource management and sustainable development.

Some legal tools are considered to be of particular interest to ICM. For example, the Water Code (1979) established a “protected coastal strip” of 250 meters, measured inland from the high watermark, along the Atlantic Ocean, Río de la Plata, Uruguay River and Merin Lagoon. Any action taken within this protected coastal strip that could modify its natural configuration requires prior authorization and an Environmental Impact Assessment (EIA). Since much of the Uruguayan coastline had suffered changes by 1979, the Code also states that the protected coastal strip could extend either 250 m inland or to the nearest paved road, whichever occurred first. Presently, few examples exist of a full 250 m protected coastal strip.

The Natural Protected Areas Law (2000) inaugurated the creation and management of a national system of protected areas as an instrument for the implementation of the national environmental protection policies and plans. The National Environment Directorate (DINAMA), in the Ministry of Housing, Planning and Environment (MVOTMA), is in charge of establishing, executing, supervising and evaluating the protected area plans. The law also establishes a multi-stakeholder National Advisory Committee including national and local government institutions, the University of the Republic, and both private and non-governmental organizations (NGOs).

The Coastal Ordinance of the Municipality of Rocha (2003) attempts to unify national and local legislation for the sustainable planning and development of the coastal zone. It defines ICM as a principle methodology and uses both watershed and Territorial Sea (12 nautical miles) approaches to establish inland and ocean limits to the coastal zone. The Ordinance includes contemporary urban and legal forms, e.g., the disincentive of linear and continuous urban development; entry to coastal sites from distant highways via a “comb” structure; the fusion of small land lots into larger ones; the prohibition of high buildings in the “protected coastal strip”; creation of an interface zone contiguous to the “protected coastal strip”; consideration of cumulative effects in EIA studies; implementation, without exception, of a *non edificandi* zone of 150 m within the “protected coastal

strip”; and zoning into differentiated categories, e.g., tourism, development and conservation.

Uruguay presents a complex institutional context with overlapping responsibilities and jurisdictions between ministries, national directorates and local governments. Baliero et al.<sup>14</sup> identified 32 institutions with some degree of responsibility for the management of coastal resources at a national, local or transboundary level. Adding institutions related to capacity building and research, the total becomes 40 (80 percent of the institutions are dedicated to management and/or research and 40 percent only to capacity building) (Table 2). From the 40 institutions, 65 percent have a disciplinary approach to management and 28 percent a multidisciplinary approach, while only 8 percent have demonstrated evidence of practices closer to ICM (Figure 2).

**Table 2.—List of institutions with responsibilities in the management, capacity building and research of the Uruguayan coastal zone. The numbers indicate the degree of closeness or approach to ICM by the institutions: 1) Disciplinary, 2) Multidisciplinary and 3) Interdisciplinary (see details in Baliero et al. 2006).**

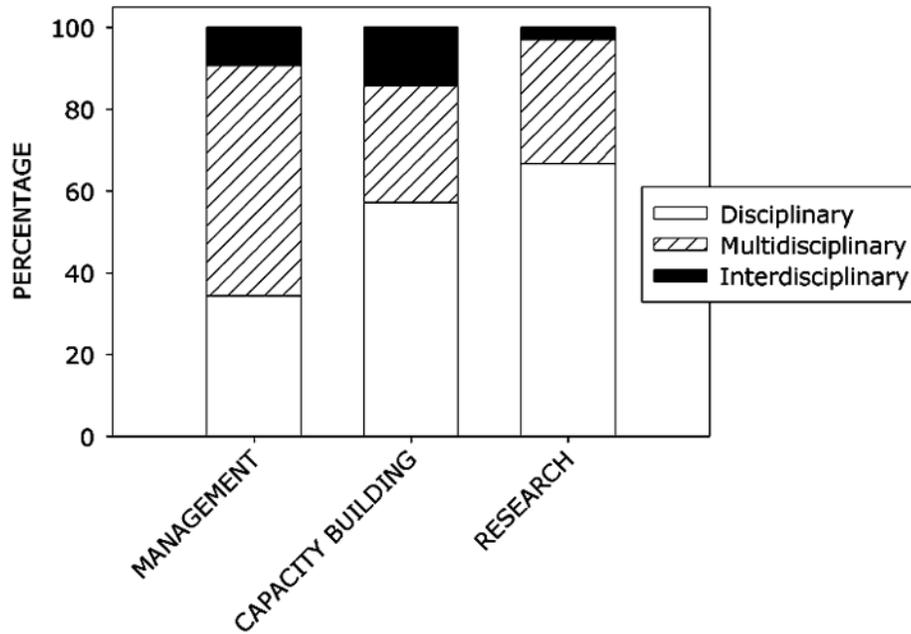
INSTITUTION	MANAGEMENT	CAPACITY BUILDING	RESEARCH
<b>PRESIDENT’S OFFICE</b>			
Planning and Budget Office	1	1	
Regulatory Unit of Energy and Water Services	1		
Program “Agenda Metropolitana”	2		2
<b>MINISTRY OF DEFENSE</b>			
National Meteorology Directorate	1	1	1
Navy (Prefecture, SOHMA, School)	2	1	1

14. W. Baliero, E. Biasco, D. Conde, R. Cortazzo, M. Fossati, D. Gorfinkiel, E. Lorenzo, R. Menafrá, C. Piriz and I. Roche, *Estudio de Base sobre el Estado del Manejo Costero Integrado en Uruguay: práctica, capacitación e investigación*, Proyecto: Sustentabilidad de la Zona Costera Uruguaya (AUCC-CIDA), Universidad de la República, Montevideo/Dalhousie University, Halifax (2006) 28 pp.

INSTITUTION	MANAGEMENT	CAPACITY BUILDING	RESEARCH
<b>MINISTRY OF EDUCATION AND CULTURE</b>			
Technological Development Program		3	3
“Clemente Estable” Funds			2
National Research Funds			1
National Cultural Patrimony Commission	1		1
Research Institute “Clemente Estable”		1	1
Basic Sciences Development Program		1	1
<b>MINISTRY OF FOREIGN RELATIONS</b>			
Environment Office	1		
Administrative Commission of the Río de la Plata	2		1
Technical Commission for the Maritime Front	2		1
<b>MINISTRY OF LIVESTOCK, AGRICULTURE AND FISHERIES</b>			
National Directorate of Aquatic Resources	1	1	2
National Directorate of Natural Renewable Resources	2		1
Directorate of Agricultural Services	1		1
General Forestry Directorate	1		1
<b>MINISTRY OF TRANSPORT OF PUBLIC WORKS</b>			
National Hydrographic Directorate	2		1
<b>MINISTRY OF INDUSTRY, ENERGY AND MINING</b>			
National Directorate of Mining and Geology	1		1
<b>MINISTRY OF TOURISM</b>			
	1	1	1
<b>MINISTRY OF HOUSING, PLANNING AND ENVIRONMENT</b>			
National Environment Directorate	2	1	1

INSTITUTION	MANAGEMENT	CAPACITY BUILDING	RESEARCH
Environment Technical Advisory Commission	2		
National Planning Directorate	2	1	2
Planning Technical Advisory Commission	2		
<b>MUNICIPAL GOVERNMENTS</b>			
Colonia	2		1
San José	2		1
Montevideo	3		1
Canelones	2		1
Maldonado	2		1
Rocha	3		1
<b>AUTONOMOUS AND DECENTRALIZED ORGANIZATIONS</b>			
National Fuel, Alcohol and Portland Administration	2		2
National Ports Administration	2		1
Public Sanitary Works Administration	1		1
<b>PROGRAMS AND PROJECTS</b>			
ECOPLATA	3	2	2
PROBIDES	2	2	2
FREPLATA	2	2	2
<b>EDUCATION INSTITUTIONS</b>			
University of the Republic		2	2
TRAIN SEA COAST		3	
CLAEH (Master program in Local Development)		2	2

**FIG. 2.**—Degree of proximity to ICM of the institutions that are involved in the management, capacity building and research related to the coastal zone in Uruguay (see details in Baliero et al. 2006, n. 14).



### **Inter-Institutional Coordination**

The experience of initiatives such as ECOPLATA, PROBIDES<sup>15</sup> and FREPLATA<sup>16</sup> has proven to be positive as vehicles to encourage opportuni-

15. PROBIDES—“Program for Biodiversity Conservation and Sustainable Development of the Eastern Wetlands of Uruguay,” is composed of the municipalities of Maldonado and Rocha, plus Cerro Largo, Treinta y Tres and Lavalleja, the Ministry of Housing, Planning and Environment and the University of the Republic.

16. FREPLATA—“Environmental Protection of the Rio de la Plata and its Maritime Front: Pollution Prevention and Control and Habitat Restoration,” is a binational project by Argentina and Uruguay.

ties for institutional interaction and planning. Unfortunately, this has not translated into major advancements in ICM.<sup>17</sup>

ECOPLATA, a program for the support of Integrated Coastal Zone Management in Uruguay, is the only initiative whose main goal is to promote and facilitate integrated management of coastal areas. ECOPLATA is a long-term initiative (est. 1997 to present) resulting from an agreement between different ministries and the University of the Republic. Additional objectives include: building institutional commitment, supporting government, academic and community actors regarding the creation and use of scientific knowledge to influence both the decision-making process and community behavior. In the beginning, ECOPLATA contributed significantly to the reinforcement of research capacity in national institutions along with the acquisition of extant data in order to generate information needed to define adequately coastal problems.<sup>18</sup> At present, ECOPLATA is viewed as a vehicle to encourage discussion and problem-related decision-making. The adopted slogan “connecting knowledge with action” is based on the assumption that the principal challenge is to link available scientific knowledge with decision-making processes, while equipping political actors with competence in integrated coastal management.

During its present phase (2006–2009), ECOPLATA is attempting to create working plans based on five thematic areas chosen with institutional cooperation: 1) governance, 2) vulnerability of the coastal zone, 3) sustainable development, 4) coastal infrastructure, and 5) coastal environmental information system. In addition, it is building the organizational structure needed to work in an integrated management scenario, with new institutional partners such as the Ministry of Tourism and various NGOs.

Other inter-institutional coastal initiatives have been promoted, such as: planning and environment advisory commissions; national-local government agreements; and, an ICM Coordinating Commission created by decree in 2001 (currently inactive). The Planning Technical Advisory Commission of the Ministry of Housing, Territorial Planning and Environment, was created as an inter-institutional vehicle where national policies regarding territorial planning were to be discussed among institutional actors and NGOs (representing civil society). The Environment Technical Advisory Commission, also from the same Ministry, was created to discuss national environmental policies among different actors.

Agenda Metropolitana is an inter-institutional program reporting directly to the President’s Office. Its objective is to support and define integrated local development through planning and policy formulation, with public participation. One specific goal is to promote integrated

17. See Baliero et al., n. 14 above.

18. See Martínez and Fournier, n. 7 above.

management of the coastal area, focusing initially on San José, Montevideo and Canelones.

All of these initiatives have been positive and have achieved a certain amount of progress, but until now have exhibited very little measurable impact as to improve coastal zone management. Continuity is lacking in these efforts, with parallel endeavors and a misuse of resources (time, economic and human). As a result, similar issues are discussed in different settings between the same institutions and delegates. This “discussion overload” rarely leads to implementation, and instead has led to disbelief in this array of processes and a lack of interest on the part of participants. It would be desirable to create a single coastal coordinating body in order to increase efficiency and implementation of management measures and activities.<sup>19</sup> Also, a single unified text that encompasses coastal policies and legislation is also an important requirement. Unlike other countries in the region (e.g., Brazil, Chile, Ecuador and Colombia) no national framework or policy exists for the planning and management of the coastal zone of Uruguay.<sup>20</sup>

At the local level, the Coastal Ordinance of the Municipality of Rocha has proven to be an innovative and complete tool for coastal management. Unfortunately, the local government lacks the financial and human resources to implement this document.<sup>21</sup> Recently, other coastal municipalities have expressed an interest in creating a coastal ordinance modeled after the Rocha example. While some might consider this to be a very positive result, some caution is encouraged as Uruguay could end up with six distinct coastal ordinances to cover a 700-km coastline. Without a national framework or guideline this would be a scenario quite distant from an integrated approach to the management of the Uruguayan coastal zone.

## **Capacity-Building and Research in ICM**

### *Capacity-Building*

After a comprehensive assessment, Ávila et al.<sup>22</sup> and later Baliero et al.<sup>23</sup> reported that in Uruguay there is no permanent training or education

19. See Baliero et al., n. 14 above.

20. A. Acuña and N. Zapata, *Estudio sinóptico: la Gestión Costera en Chile-Estado actual y perspectivas*, Informe de ECOPLATA (2004) 105 pp.; M. Asmus and D. Kitzmann, *Gestao Costeira no Brasil: Estado atual e perspectivas*, Informe de ECOPLATA (2004); J.M. Barragán Muñoz, C. Castro and C. Alvarado, “Towards Integrated Coastal Zone Management in Chile,” *Coastal Management* 33 (2005): 1–24.

21. See Baliero et al., n. 14 above.

22. See Ávila et al., n. 10 above.

23. See Baliero et al., n. 14 above.

program related directly to ICM. There are, however, a number of graduate level courses within different degree programs available at the University of the Republic. Ávila et al.<sup>24</sup> conducted a study to 1) identify the demand for training and education in ICM and 2) explore activities that would contribute to strengthening the capacity of institutions and stakeholders to manage coastal resources and environments. The resulting surveys and interviews confirmed that a demand for capacity building in ICM does indeed exist in Uruguay.

Stakeholders identified the three most important coastal zone problems as a lack of EIA planning and usage in coastal development, user conflicts and pollution. Preservation of the coastal zone and coordination between all stakeholders were identified as the key challenges that confronted institutions responsible for managing coastal areas. They also felt that several major obstacles impeding the implementation of ICM projects, plans and programs was the relationship between ports and cities, the financing of ICM activities and the creation of interdisciplinary knowledge. A key outcome of this study was the realization that stakeholders had an interest in building capacity in areas such as protected areas, territorial planning, community participation processes, aquatic contamination, negotiation and conflict resolution, environmental and natural resource economics and policy processes.

### *Research*

Among the 40 institutions identified by Baliero et al.,<sup>25</sup> 34 directly or indirectly conduct or promote research related to ICM. The majority are drawn from government, decentralized entities and public educational institutions (88 percent), while the remainders are associated, for the most part, with the ECOPLATA, PROBIDES and FREPLATA initiatives.

According to project evaluations, publications and theses, the dominant disciplines are biology/environment and chemistry/engineering (25–55 percent), while social sciences, law and archeology occur to a lesser extent (0–25 percent). The dominant thesis disciplines are land planning and biology/environment (50 percent). A total of 271 studies associated with ICM were identified over the past 20 years: 117 projects, 129 publications and 25 theses.<sup>26</sup> In all cases, the approach used to address ICM was mainly disciplinary (60–85 percent), with between 10–20 percent of the

24. See Ávila et al., n. 10 above.

25. See Baliero et al., n. 14 above.

26. *Id.*

studies identified as multidisciplinary and only 5–28 percent that displayed an interdisciplinary approach.

The number of studies produced each year since 1986 shows a definite increase between 1998 and the present in all three categories (projects, publications and theses), indicating a recent increase in coastal related studies. The geographic range among identified studies shows that the majority addressed the whole coastal zone as the general study area (35 percent), followed by the Atlantic coastal zone (30 percent), the Center Zone (25 percent) and the Western Zone (10 percent). A similar tendency was confirmed by Menafrá et al.<sup>27</sup>

From the total number of projects, 70 percent were carried out by the University of the Republic, followed by ECOPLATA, PROBIDES and FREPLATA (25 percent). Among the university projects, 82 percent were conducted by the Faculties of Sciences, Engineering and Architecture, and 18 percent by Social Sciences, Law, Veterinary and Humanities. The University of the Republic participates through its faculty in several initiatives related to environmental education and research. According to Ávila et al.,<sup>28</sup> even though individuals participating in these activities possess disciplinary training (engineers, architects, biologists, lawyers, etc.), they eventually acquire specialized knowledge and skills to enable them to perform within the context of ICM. In this vein, ECOPLATA, PROBIDES and FREPLATA have performed as venues for informal capacity building where participants gradually learned to relate and work in a coordinated and integrated manner, thereby creating a critical mass of individuals committed to ICM.<sup>29</sup>

### **Major Deficiencies and Recent Progress in Coastal Management**

Several factors compete synergistically against the successful implementation of ICM in Uruguay, e.g., the depressed economic state of some coastal sectors, insufficient environmental consciousness, deficiencies in the institutional framework, ambiguities in present and forthcoming coastal management policies, and, the cultural and social characteristics of the local population. In the following discussion we analyze these deficiencies and consider some recent progress.

27. R. Menafrá, L. Rodríguez-Gallego, F. Scarabino and D. Conde, eds. *Bases para la conservación y el manejo de la costa uruguaya*, VIDA SILVESTRE URUGUAY (Montevideo: Vida Silvestre, 2006), i-xiv+668pp.

28. See Ávila et al., n. 10 above.

29. *Id.*

*Public Awareness of the Ecological and Economic Relevance of the Coast*

Although public ecological consciousness has changed over the past two decades, many coastal inhabitants and tourists fail to appreciate the connection between their actions and the emerging degradation of the coastal zone. Greater awareness of the importance, fragility and economic role of our coastal resources must be encouraged through educational campaigns and targeted material. Hopefully, this will contribute to changes in behavior, and help to further support new initiatives and greater political determination for environmental policy change.

Incorporating specific figures on the economic value of goods and services provided by coastal ecosystems can reinforce arguments for strengthening coastal protection and management programs. Therefore, research organizations should embark on studies, using reliable methods, which address both the value of coastal resources as well as the costs associated with their restoration. Simultaneously, considerable effort would be required: to incorporate these results into ongoing management plans and agendas; to use them in discussions regarding the actual cost of development alternatives; and, to employ them in such a way as to lessen damage to our coastal ecosystems.

*Community Participation*

Cultural and political issues, the exploration of which is beyond the scope of this article, have historically limited involvement by people and communities in the processes designed to develop environmental action in coastal Uruguay. Correspondingly, over the past decade several efforts to address coastal issues have suffered from the same condition, despite the best intentions of institutions, programs and committees. Although some examples of commitment do exist, regular and lasting participation requires extraordinary efforts by leaders, who are, in turn, hindered by leadership instability. Community distrust for new coastal initiatives appears to be grounded in previously weak or unsuccessful attempts to address specific coastal crises. Following a lack of success, public participation generally declined or simply drifted away.

An outstanding model of long-term effective involvement can be found in the Local Committee of Laguna de Rocha. This group, in existence since 2003, has played a key role in the creation of a management plan for an internationally recognized coastal area in Uruguay. Although the Rocha committee may be the exception rather than the rule, it does provide an important example and model for other coastal areas. If broadly based and permanent support from stakeholders is presumed to be a requisite for success in ICM, then long-term initiatives must be organized to improve

coastal community participation. In this context, the National System of Protected Areas could have an important, possibly leadership role in helping to generate confidence in future initiatives by coastal stakeholders.

#### *Role of Government*

Implicit in the above assessment is the assumption that institutions with coastal competence, appropriate geographical jurisdiction and legal attributes, must play important roles in future coastal initiatives. Presently, the lack of cooperation among national public institutions is a cultural and political tradition; one that is also responsible for considerable inefficiencies. Major barriers exist to inhibit hoped-for changes among old, compartmentalized and solidified structures in favor of new holistic arrangements. Institutions continue to battle for leadership in coastal resource management, an attitude that clearly conspires against the process of integration. Recently, some efforts have been observed in government circles, dealing with the reorganization of existing offices and the creation of integrated national offices (e.g., Agenda Metropolitana), which do offer some genuine hope. However, there is one cautionary note. While planned as a way of improving efficiency, these recent modifications could have the opposite effect by increasing fragmentation, especially among environmental issues.

An example of this potential drawback is a specific water issue. Traditionally, water problems in Uruguay have been tackled by different institutions without major cooperation, or worse, with overt attempts to dominate specific areas. The struggle between the National Environment Directorate (DINAMA) and the National Hydrographic Directorate (DNH), for control of quality assessment of water bodies, has been further complicated by the presence of municipal authorities who often have the final decision regarding the management of natural resources. Recently, a further wrinkle was added with the creation of the National Water and Wastewater Directorate (DINASA), which now splits responsibilities for water among three national directorates (DINASA, DINAMA, DNH), plus several more indirect jurisdictions distributed at national and local administrative centers.

Nevertheless, since these changes are recent and part of a general restructuring of the entire central government administration, the actual outcome of efforts to reduce historical power struggles, improve inter-agency cooperation, and clarify roles in environmental, aquatic and coastal issues management may require some time to emerge.

A major barrier to sustained environmental action in Uruguay is the lack of continuity. Uruguay is affected by recurring economic crises, public distrust and a lack of environmental consciousness that can greatly burden initiatives of all kinds (e.g., projects, programs, debate, discussion, events,

etc.) and reduce their capacity to establish themselves as permanent arenas for change. This has resulted in reduced social and financial support for these initiatives. For example, venues of coastal debate such as ECOPLATA, PROBIDES, or the ICM Coordinating Commission, have suffered the consequences of changing policies, politicians and agendas at local and university levels, as well as nationally. This has resulted in short pulse-like efforts that do not reach the threshold time necessary to achieve critical mass or sufficient capacity to make genuine and lasting contributions to improved coastal area conditions.

#### *New Coastal Legislation*

A high degree of uncertainty continues with regard to the ongoing initiatives of the new National Directives for Coastal Space and the Territorial Planning Law. Future ICM efforts in Uruguay largely depend on details contained in legislation, which has yet to be formally approved. In 2003, a National Coastal Policy circulated publicly as a Decree draft. It recognized integrated coastal management as part of the strategic vision, but it was essentially a territorial planning proposal, and as a consequence it did not contain an integrated vision that guaranteed coastal sustainable development. For example, some aspects, related to economic activities and infrastructure, received considerably more attention than either conservation or the restoration of natural, cultural, historical, or aesthetic resources and values. Although this view has traditionally prevailed in Uruguay, it is presumed that a forthcoming version of this policy, originating from the National Directorate of Territorial Planning (DINOT), and presently undergoing public scrutiny, will take into account these deficiencies and include a more integrated vision to successfully address coastal problems. These changes are essential in order to receive support from multiple stakeholders and ultimately to achieve genuine ICM objectives.

Despite being the most complete and advanced coastal legislation in Uruguay, the Coastal Ordinance of Rocha is facing major challenges in its implementation. As mentioned above, it is generally regarded as a good legal instrument, but unfortunately because of institutional limitations the local government is somewhat constrained. Given the modest local economy, largely dependant on summer tourism, a decision needs to be made as to whether traditional development should be permitted along Rocha's coast or whether development should be delayed until alternative models can be considered. Unfortunately, this type of debate is not taking place. Meanwhile, despite the goodwill of local authorities, the coastal zone of this municipality is experiencing great pressure from investors who wish to develop coastal areas with the addition of hotels, seaside highways, port infrastructure, and private neighborhoods, etc.

*Innovative Financing*

Effective coastal management requires long-term financial support, but traditional infrastructure is often unable to satisfy all requests for environmental financing. Therefore, innovative approaches are needed to fill the gap between available funds and actual costs for conservation or restoration. In Uruguay, a traditional but limited source of money is that derived directly from government programs. This can be an important limitation because it means that organizations normally receive only partial support. Beneficiaries of this approach include, for example, ECOPLATA and PROBIDES, municipalities and Agenda Metropolitana. Also, relying on a single source of funding can increase the risk of financial gaps. Alternatively, a combination of traditional governmental support, encouragement of voluntary measures (such as, landowner recognition programs or tax-exempt bonds) and community-based efforts (such as, education, transfer of rights to local power, local entrance fees for protected areas) could create a comfortable financing quilt (sensu Haas et al.)<sup>30</sup> that could facilitate the achievement of environmental goals.

In a country where funding for environmental initiatives must compete with other social needs, environmental protection and prevention seems to be a cost-effective approach. Avoidance of coastal degradation, through public awareness and education programs, can be viewed as an indirect form of financial support, especially since restoration can be very costly.

*Involving the Private Sector*

The Uruguayan coastline is largely privately owned. This fact is often not considered by those responsible for managing coastal resources (government) or those proposing management alternatives (internationally funded projects). Private stakeholder participation or involvement has largely been absent in most previous coastal management initiatives. As a result, most proposed activities eventually come to a halt when confronting private owner's property rights. As long as this trend continues and private stakeholder groups are not integrated into all aspects of the ICM process, initiatives to achieve tangible results in the sustainable development of the coastal zone are doomed to failure.

An important complicating constraint is that private sector congruency in stakeholder representation is difficult to achieve because it is a very heterogeneous group. However, examples exist of groups that manage to

30. J. Haas, E. Hickey and J. Greer, "The Community Quilt concept of Environmental Financing," *InterCoast Network* 33 (1999): 8-9.

engage large numbers of diverse individuals, such as the tourism sector, real estate agencies, or local private owners that have previously participated in coastal management initiatives. The Rocha Lagoon Committee, a multi-partner group that integrates private land owners and local enterprises, has been successful in addressing major issues faced by this protected Atlantic coastal lagoon. It can be considered as an exemplary case, suitable for replication at other locations along the coast.

*Research and Capacity-Building Programs Adapted to Management Needs*

A significant tradition of coastal research exists in Uruguay, achieved mainly at the University of the Republic (UdelaR).<sup>31</sup> This research capacity has only recently been focused on solving environmental problems. For decades, academia has been accused of producing novel but rarely applicable information that lacks focus and/or practical usefulness for the purpose of management. It is now a well accepted premise that ICM must be grounded on the best scientific information available, which must in turn be appropriately delivered. New requirements demanded by national funding programs that support environmental research have partially solved this problem by providing specific guidelines for the utility and promptness of the research outcomes. Adapting traditional basic research groups that could contribute significant data into the management process is presently in development phase, and so it might be a hindrance to ICM success in the short term.

Similar situations are also possible with new capacity-building initiatives, such as the new *MCISur* Master Program at UdelaR,<sup>32</sup> a novel proposal that is attempting to deliver an interdisciplinary ICM approach within the context of an educational program. The program aims to show that the knowledge, tools and personal capacities necessary to adequately manage coastal problems can be drawn from and built upon the institutional knowledge and experience of all the program partners. *MCISur* is based on a partnership between UdelaR and Dalhousie University (Canada), along with several regional universities (drawn from Argentina, Chile and Brazil) and the Ecology Institute from Mexico. It will also expand the capacity of the UdelaR through an outreach component that will take place between graduates and coastal communities. *MCISur* is the first cooperative, multi-faculty, interdisciplinary effort of its kind at UdelaR. The implementation of the master's program has resulted in the capacity building of a teaching staff in an interdisciplinary context, the construction of an information baseline

31. See a recent compilation by Menafrá et al., n. 27 above.

32. See *MCISur* website: <<http://www.fing.edu.uy/imfia/mcisur>>.

for teaching and research, the establishment of an institutional framework to facilitate horizontal integration of faculties within the UdelaR, and the creation of networks of cooperation at regional, national and local levels. The authors of the present article, which comprise the core teaching staff of this new program, feel that the results and potential impact of this program will need to be confirmed, probably requiring the completion of at least one full two-year Master's program cycle.

*Demonstrative Experiences and Lessons Learned*

In Uruguay, the lack of successful local management experiences addressing important coastal issues that include the whole cycle from diagnosis, planning, execution to monitoring/adaptation and evaluation, continues to be a problem that works against the credibility of any new ICM initiatives. Some exceptions are known, such as the pilot projects of ECOPLATA, which have been partially successful in demonstrating the utility of integrated approaches to address specific coastal issues. However, there are not yet sufficient examples to convince politicians, managers and communities of the advantages of integrated and holistic approaches over more sectoral and isolated methodologies. Uruguay has reached the point in which public demand exists for the creation of at least one complete and successful ICM experience. More than likely, fulfillment of this circumstance could trigger public support for future ICM initiatives.

The new National System of Protected Areas could represent a potential area to achieve such a condition. For instance, the Rocha Lagoon probably represents one of the more advanced national cases, due in part because of the existence of a large set of scientific and social information, considerable public awareness and global proposals for management of natural resources. This case symbolizes an important conservation goal for Uruguay and may be the vanguard initiative to prove the benefits of integrated approaches to environmental issues.

The exchange of outcomes from the small number of completely or partially successful coastal experiences, their adoption by intervening stakeholders and their ultimate conversion into lessons learned, has not yet been completely processed. Recent failed coastal management initiatives, for which solid scientific information was available, suggest that some significant impediments exist regarding the effective exchange of information between academia and the managing agencies.

The recent construction, once again, of coastal roads on or close to dune systems show that it is a common occurrence for some lessons not to be learned. For example, knowledge gathered from the construction of a coastal road in the eastern city of Piriápolis, a well-known case of anthropogenic erosion that left a major sea resort without its main beach,

has certainly not been learned. Further, a similar road built along Ciudad de la Costa, east of Montevideo significantly modified both the dune environment and the natural hydrology, leading to recurring flooding episodes in several urbanized areas. This construction, carried out without proper environmental considerations, was done with the sole objective of facilitating the traffic. Interestingly, ECOPLATA did provide specific technical guidance that suggested the discontinuation of road-building parallel to the coastline in favor of right angle accesses.

The relatively recent protection of wetlands in the Santa Lucia River (which occurs along the western border of Montevideo) has been orchestrated by the municipalities of Montevideo and San Jose since the early 1990s. The designation of areas of natural protection in the fairly urbanized areas of Montevideo and the recent creation of a national system of protected areas represent some exemplary outcomes of what has been learned from several decades of accumulated environmental know-how. Unfortunately, best practices are still atypical in the Uruguayan coastal environment and repetition of inappropriate practice in new locations continues to be a major challenge for ICM.

#### *Environmental State of the Coast*

Deteriorating areas of the Uruguayan coast represent a major shortcoming for the successful implementation of ICM plan and programs. Toxic pollution accumulated over many decades in Montevideo Bay, significant and irremediable erosion processes underway in several areas of the southwest, vast modifications to the natural hydrogeology of large areas of the Eastern Wetlands, and the huge input of toxic and organic wastes into the Río de la Plata illustrate some of the shortcomings that managers have to deal with when proposing new initiatives for coastal remediation or management.

Some of these conditions may be remediable only over the long-term. For example, some recent proposals address the recovery of the original hydrology of the Eastern Wetlands which, although possible, may take several decades and large investments. Other cases, like the Bay of Montevideo, are complex, but may be successfully overcome when properly considered through an ICM and watershed approach (including social and economic aspects). This, although intricate, may be possible in the long-term if based on a perspective of self-determination, independent of changing governments and political agendas (i.e., based on strategic environmental planning and an ecosystem-based management perspective, which is seldom a feature of policy discussions in Uruguay). Cases like the Río de la Plata, a sink of pollutants from remote, diverse and complex origin, are not feasible to solve in their entirety, at least on a mid-term basis.

## **CHALLENGES AND OPPORTUNITIES FOR ICM IMPLEMENTATION**

Avila et al.<sup>33</sup> and Baliero et al.<sup>34</sup> have conducted independent diagnoses of coastal management in Uruguay. Taken together, they have identified the following challenges facing the implementation of ICM in Uruguay:

- Generating public consciousness of the social and environmental values of coastal resources and on their wise use for the sustainable management of the coastal zone.
- Institutionalizing ICM as part of the government agenda, including the responsibility of leading these processes in the long-term and allocating funds for their implementation.
- Promoting a decentralized system of decision-making by which local communities can set their priorities in terms of development and conservation.
- Integrating research, education and outreach into the decision-making process, ensuring scientific support, promoting public awareness and making information readily available.
- Generating an appropriate information baseline over which to measure and evaluate the success of ICM activities, practices, projects and programs.
- Learning from international experience and practice in ICM, and adjusting lessons learned to the local context for their implementation.

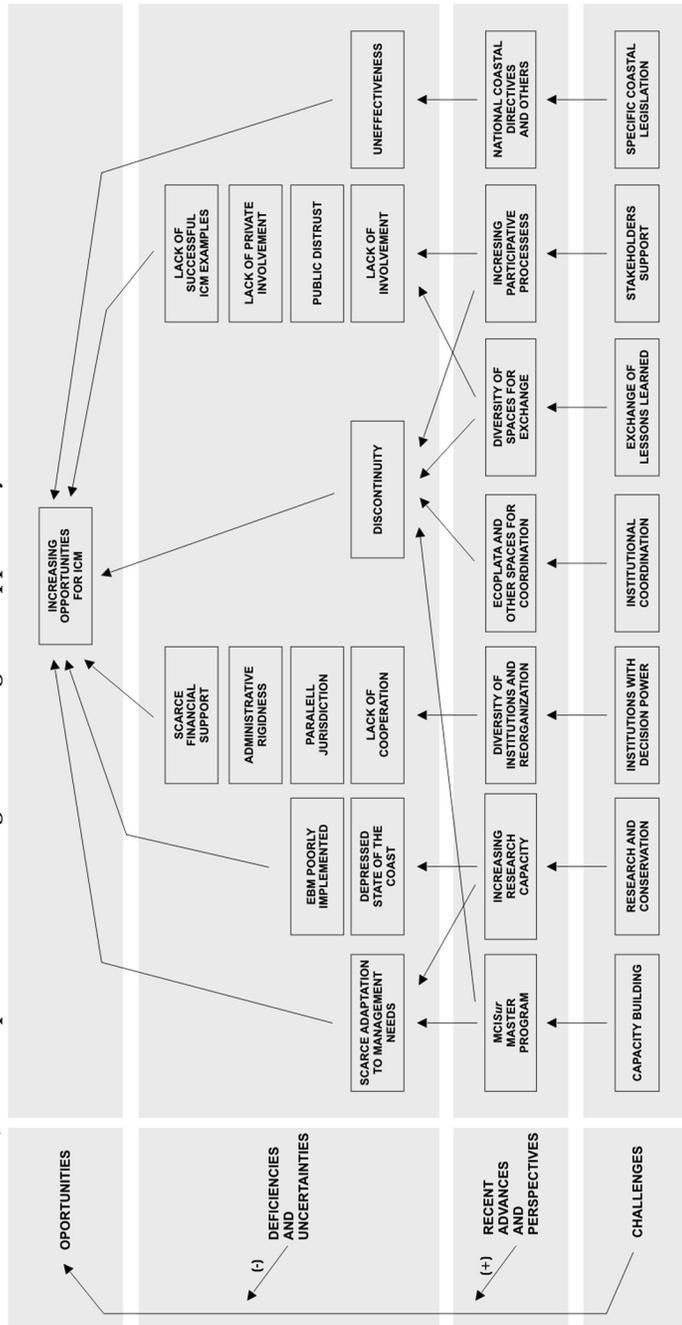
When combining all elements at play, opportunities for action arise (Table 3, Figure 3). A major segment of the present problems facing Uruguay are based on institutional deficiencies. However, based on recent attempts to foster reproducible change in other areas, it appears that the combination of new legislation, novel coordination opportunities and a growing interest by municipal authorities could trigger renewed momentum for major change in coastal issues.

Public participation in decision and planning/management processes has begun to improve following decades of diminished interest. Nevertheless, this course of action requires energetic support from all sides to guarantee stakeholder contributions at all stages of the management process. Ongoing participative practices to propose new legal directives for the coastal zone represent a procedure that should be replicated at other levels (e.g., local) with the aim of guaranteeing the long-term interest of stakeholders.

33. See Ávila et al., n. 10 above.

34. See Baliero et al., n. 14 above.

**FIG. 3.—Major challenges for coastal management in Uruguay, with indication of recent advances and perspectives, deficiencies and uncertainties. The balance of all positive (recent advances and perspectives) and negative (deficiencies and uncertainties) factors permits the emergence of a global opportunity for ICM.**



**Table 3.—Brief summary of the main positive and negative aspects of the present situation of coastal management in Uruguay.**

Positive Aspects	Negative Aspects
<ul style="list-style-type: none"> <li>– Increasing awareness in the political community of the necessity of a new, specific and holistic approach to coastal issues</li> </ul>	<ul style="list-style-type: none"> <li>– Depressed state of some coastal sectors</li> <li>– Lack of specific financial resources and excessive dependence on external funds</li> <li>– Ecosystem-based management approach still in a developing phase</li> </ul>
<ul style="list-style-type: none"> <li>– Novel and specific legislation for the coast under progress</li> </ul>	<ul style="list-style-type: none"> <li>– Uncertainties about the contents and efficiency of the upcoming legislation</li> </ul>
<ul style="list-style-type: none"> <li>– Diversity of local and national institutions with decision power on coastal issues</li> <li>– New arena for institutional collaboration pertaining to the coast (i.e., Ecoplata program)</li> </ul>	<ul style="list-style-type: none"> <li>– Parallel efforts and jurisdictions still dominating the institutional arrangement</li> <li>– Lack of real cooperation among diverse offices at the government and municipal levels</li> <li>– Institutional and administrative rigidity</li> </ul>
<ul style="list-style-type: none"> <li>– Recent creation of a Masters program in Integrated Coastal Management as a key initiative of capacity-building currently being implemented</li> </ul>	<ul style="list-style-type: none"> <li>– Research and capacity building programs not fully adapted to management needs</li> </ul>
<ul style="list-style-type: none"> <li>– Diversity of informal arenas for the exchange of experiences and lessons learned</li> <li>– Promotion of participative processes in decision-making and the generation of new policies</li> </ul>	<ul style="list-style-type: none"> <li>– Discontinuity of initiatives for cooperation and exchange of experiences</li> <li>– Lack of systematization of experiences and lessons learned</li> <li>– Public distrust and scarce involvement</li> <li>– Lack of successful examples of long-term integrated management of natural resources or ecosystems</li> <li>– Scarce private involvement in coastal management efforts</li> </ul>

Currently, the government is implementing a project, funded by the Global Environment Facility and the United Nations Development Programme, with the objective of strengthening the capacity of Uruguay to implement its National System of Protected Areas. At least six coastal marine areas have been selected and have initiated the process to be incorporated into the system. This creates a good opportunity for the use of protected areas as exemplar instruments to contribute to biodiversity conservation,

local development and the successful management of coastal zones. In particular, the case of the Rocha Lagoon presents suitable conditions for ensuring the completion of at least one full management cycle and the conversion of these experiences into lessons learned. Stronger links should be pursued between the initiatives to implement protected areas and ICM.

High quality capacity-building and research programs, key to an adequate and scientifically sound management, are another central piece in this process. Academic groups conducting coastal programs and projects must receive adequate financing coupled with improved recognition from the management side. Simultaneously, faculty members and programs must adapt more quickly to the urgent requirements of government and decision makers. The regional component of the new MCI *Sur* master's program at UdelaR can potentially act as a means to bring together the experiences of these countries, assess ICM regional development in an academic context and help build a Latin-American ICM model.

Greater inclusion of specific references to ICM and ecosystem-based management in announcements for funding opportunities may help to draw academic and management approaches closer. This bilateral arrangement could produce proposals in which objectives, methodologies and expected outcomes emerge in advance from the combination of interests and needs from both sides (e.g., ecosystem-based management tools).

The lack of continuity and systematization of all these new and promising initiatives at all levels appears to be a major obstacle. Uruguay needs to seriously study the feasibility and potential of creating a single coastal coordinating body and/or a unified national coastal policy framework, in order to move ICM to the next level. This is an important barrier that must be addressed in order to move towards a more comprehensive and long-lasting approach to the proper management of the Uruguayan coastal zone.

ICM in Uruguay has not been institutionalized by government, nor have institutions embraced the experiences and knowledge generated locally during the course of previous ICM related projects. Even more worrying is the fact that insufficient attention is being given to the vast international experience of ICM and its acceptance as the most logical approach to sustainable coastal development. As suggested by Menafra and Conde,<sup>35</sup> Uruguay needs to learn more from practices and lessons in other countries, with many more years of experience. This experiential knowledge should be adapted to the local context as part of the search for innovative and effective coastal management.

35. R. Menafra and D. Conde, "Manejo Costero Integrado: Historia, Alcances y Desafíos," *AMBIOS-Cultura Ambiental*. Año IV, No 11, p. 9, Junio 2003, Uruguay.