

# *Chile Litoral*

DIÁLOGO CIENTÍFICO SOBRE LOS ECOSISTEMAS COSTEROS

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## INTRODUCTION

# Governance, Science and Regional Economic Development in Chile's Coastal Zone Ecosystems

RONALD G. HELLMAN

The Latin American Faculty of Social Sciences (FLACSO-Chile) sponsored a three-day conference on "Governance, Science and Regional Economic Development in Chile's Coastal Zone Ecosystems" in November 2002. This conference complements the Inter-American Comparative Ecosystems and Regional Economies (IACERE) research team's extensive work on integrate and policy-relevant studies of estuary ecosystems in the Americas, based at the Americas Center on Science and Society (ACSS) at the CUNY Graduate School.

The program of activities during the FLACSO/ACSS conference in Chile brought together Chilean natural and social scientists, policymakers, and private sector stakeholders to examine the important socio-economic, political, and ecological issues pertaining to Chile's extensive coastal zone. Chile's geographical position with vast coastal and estuarine resources requires a comprehensive ecological and economic analysis. If Chile is to maximize its development in the next decade, the country must address its enormous coastal potential for its economic future.

The conference provided an assessment of the coastal zones by taking an integrated, comprehensive and multi-disciplinary approach in which the role of science in policymaking is fundamental: for example, how can the latest scientific advances be applied to the demands of both ecological policy management and economic development?

A preliminary coastal assessment is a first step for policymakers to be able to implement rational economic policies with ecologically-oriented inputs, that are scientifically sound. Economic policy must be ecologically as well as socially and politically sustainable; hence the need for scientists (natural and social) to work together with policymakers

and participants from NGOs and civil society. This integrated approach to coastal and estuarine management can obviously benefit the Lagos administration, giving it the context in which to implement economic and social policies.

This comprehensive and integrated analysis was approached by convening key actors involved and/or interested in coastal management policymaking. Hence, the conference served as a communication bridge between science and policy-making, bringing together natural and social scientists along with government (policymakers) and non-governmental actors as well as with private sector partners, and local citizen groups.

The conference builds on IACERE's work on the comparative understanding of estuaries, focusing on issues of governance, particularly accountability, de-centralization, and the role of science in the policymaking process. IACERE's integrated and comparative approach to the Tri-State New York Region, the Gulf of California and Laguna Madre ecosystems in California and Mexico, in terms of various issues that range from infrastructure building, human settlements and natural resources to issues of governance and economic development can contribute to a better understanding of the broader coastal challenges facing Chile. Thus, IACERE's comparative method addressing the fundamental parameters for understanding the changing political dynamics of coastal zone management can be helpful in developing our policy research agenda. Of particular relevance for IACERE's approach is the integration of science into the policy making process. As Oscar Muñoz, Economist from FLACSO-Chile, pointed out during the December 2000 IACERE International Research Symposium at the ACSS in New York, IACERE's framework of analysis, especially its emphasis on the role of science in policymaking, may in the future help bring to a close the existing conflict between ecological concerns and economic/equity questions facing developing countries such as Chile. In short, decision-makers need scientific (appropriate) information to make sound decisions.

The central focus of the FLACSO/ACSS conference concentrated on the Chilean governing process and its relation to science and ecosystem management. We evaluated comprehensively the political context in which Chile's coastal management policies have taken and will be taking place, particularly (a) the existing governing structures at the national, state, and local levels, (b) environmental NGOs and community and citizen organizations that actively have inputs in

policymaking, (c) the existing legal regime including environmental laws and regulations, e.g., marine law, water quality standards, ecological recuperation plans and impact evaluation, and national parks; and enactment and enforcement mechanisms (e.g., quotas, seasonal closures in the area of fisheries), (d) of particular relevance for our purposes was an analysis of the role of science in the decision-making process and the role of public-private partnerships, and (e) the trade regime and new political alignments.

## EXISTING GOVERNING STRUCTURES

No exact counterpart to the English term “accountability” exists in Spanish, Chile’s official language; the closest is “responsabilidad”, but this implies a different concept. This disjuncture is symbolic of the difficulty of creating regional governance in Chile. The Chilean policy decision-making process is not yet very well established.

In addition to “accountability” another governance issue that requires special attention in Chile is “decentralization”. The political system in Chile is highly centralized with little participation of the local community in the decision making process; this makes binding decision less efficient as local communities do not welcome centralized policies, and seriously impairs the effectiveness of the local/regional authority. On governance of watershed and their management for example there is no such thing as watershed management for this is the domain of municipalities; however, the central government has the power to regulate water use, e.g., it can call for the construction of a dam. And in Chiloé exploitation and use of the estuary is managed depending upon the zonation established by the central government.

Some of these governance-related processes, especially those related to ecosystem issues, are already changing in Chile. For example, some decisions in Southern Chile are being made more locally than before, e.g., a new law is being discussed regarding water quality, whereby users will decide what ever quality they desire. Other events indicate that the integration of local inputs is gradually evolving, and the importance of accountability in the public sector is slowly increasing (since the word does not even exist in Spanish, the English “accountability” is increasingly being used).

## CIVIL SOCIETY AND POLICY

Environmental NGOs and community/citizen organizations are increasingly participating in ecosystem policymaking. The role of NGOs is particularly intensifying, although governments and industry (e.g., salmon farming) still fund the majority of ecological research (the government cross-checks private sector research). Community/citizen organizations as part of the broader civil society are becoming increasingly important in Chile, though the entrepreneurial sector prevails in this area.

## LEGAL REGIME AND ENFORCEMENT MECHANISMS

Even though Chile has a rigid legal system, we explored the important changes that are already taking place, particularly in the ecosystem sector that includes laws and regulations. Important reforms in the public sector especially in the legislative and judicial systems will most likely contribute to the improvement of public management of ecosystems.

Whereas in the US most ecosystem regulations are effective and usually enforced, in Chile, while many important regulations exist frequently they are not well enforced. The conference analyzed in depth these enforcement mechanisms of growing importance for exploitation and preservation of estuarine and coastal areas.

We particularly analyzed Chile's major challenge of developing a comprehensive and enforceable zoning code that will better protect coastal zone ecosystem at the same time that needed development can be advanced. This is a challenge that faces each of the ecosystems studied by IACERE but one that is particularly pressing in Chile because –as Under Secretary Angel Flisfisch emphasized when he led the October 2000 FLACSO/ACSS-IACERE working meeting with the Chilean Navy– the country's existing land use regime –ordenamiento territorial– is woefully lacking an enforceable mechanism to achieve sustainability in the nation's coastal zone regions. A central goal of the conference was to discuss alternative approaches to governance with specific reference to zoning issues and mechanisms.

## SCIENCE AND POLICYMAKING

We emphasized the analysis of the role of science in the decision-making process. In this important policy research area we stress the importance of the extent to which science is understood by stakeholders. This plays a large part in determining whether involvement is reactive or proactive, and whether contested or consensual. How important are mainstream politics?

We emphasized the need to understand government in action. For example, the Chilean Navy is in charge of regulating and monitoring the coastal zones, in coordination with other institutions using the Convention of Biodiversity; and the Department of Natural Resources (Comisión Nacional del Medio Ambiente) of Chile has proposed certain areas, close to pristine, to be declared protected. The role of science is critical for the successful implementation of these policy initiatives, as explicitly stated by Angel Flisfisch, then Civilian Under Secretary of the Chilean Navy, who welcomed scientific work to provide decision makers with clear and valuable information as well as models for estuarine ecosystem resilience (the navy has authority in the river bay connection and coastal zone) that they urgently need to be able to implement more rational and binding coastal management decisions.

To illustrate further the need for sound science into the policy making process, a senior defense department official –at an earlier October 2000 meeting of IACERE with high officials of the Chilean Defense Department– noted that thousands of aquaculture application were on hold because there was a lack of scientifically sound decision-making criteria for evaluating applications (the navy controls the issuance of aquaculture leases over the entire Chilean coastline).

## TRADE REGIME AND POLITICAL REALIGNMENT

Finally, in the area of governance the conference explored the trade regime and trade policies that have expanded markets and accelerated the use of estuaries in economic development. Southern Chile is a case in point: Chile is associated with Mercosur and was seeking to enter-at the time of the conference to negotiate a free trade agreement with the US (which it did in 2003) Southern Chile is the site of a billion dollar investment to construct a natural gas pipe-line from Argentina, large-scale Japanese fishing, and large-scale logging activity with exports directed primarily to Japan.

Chile is undertaking a major infrastructure development based on public-private cooperation. Proponents of the WTO, GATT, NAFTA and MERCOSUR are often resistant to any restriction of trade.

Mitigation of the harmful ecological impacts of free trade is increasingly more reliant on the input of scientific findings into the policy making process and less on governmental regulations. Because ecological challenges, like trade, are linked globally, scientific findings in one region can have direct application to other regions. Through bird migrations North and Latin America are directly linked through their estuaries, making the future of their respective wetlands essential to their mutual survival.

The changing trade regime and the relationship estuary/energy have given rise to new political actors and to changing political alignments. The conference examined these new actors that have emerged as a result of the increasing importance of ecological issues in the traditional fields of politics and economics, including governmental agencies such as CONAMA, and the new roles of traditional players such as the Chilean Navy. In addition, we looked closely at the Lagos administration's handling of ecological issues (in a context of political realignments), and compared it to the work of other two relatively new administrations in the Americas, including the Fox and Bush administrations in Mexico and the United States respectively.

To analyze these issues, the conference was broken down into four sessions, each focusing on a specific issue related to the broader theme (Governance) of the conference. The four main components of the proposed agenda included: (1) A comprehensive geographical analysis of the regional economies and ecosystems to be studied (utilizing state of the art GIS technology). This helped identify our unit of analysis: the ecological region; we mapped out the coastal area in the different ecological regions that are marked by the characterization of the estuaries and coastal zone, in terms of geological parameters, especially embayments, which are a major part of Chile's littoral regions. Since governance/administrative units are not yet organized according to ecological regions but remain political, we looked at the whole Chilean political system, i.e., existing governing structures at the national, state and local levels, particularly in the areas of accountability and de-centralization, to understand the relevant issues in policy estuarine/coastal management. However, determining and delineating ecological units is important because these are the geographical areas impacted not only by human activities

but also by the policy decisions (at local, state and national levels). The regional economies, estuarine ecosystems, and main areas of policy research (see number 2 below) that we have comprehensively identified for our research purposes include in the South: the Reloncavi Corcovado Estuary, the Chiloé regional economy and coastal zone, in the north: the Mejillones Megaport Complex; and in the central area: the Valparaíso regional economy and coastal zone.

## RELONCAVI/CORCOVADO ESTUARY

The conference built on IACERE's preliminary characterization of the Reloncavi Estuarine Ecosystem. In terms of geomorphological aspects, the Reloncavi presents two key characteristics: (a) the inner sea is strongly influenced by freshwater inputs (salinity varies between less than 5 ppm and 33 ppm, and it has deep channels and fjords –more than 70 m–); and (b) the human population –less than a million altogether– is mostly dispersed in small towns (Puerto Montt: 140,000; and a few other towns with a population less than 50,000). Fisheries/aquaculture is the single most important economic activity in the Chilean X Region, to which the Reloncavi belongs, with a total of about \$700/800 million in exports (1998); forestry and tourism are the next most important in terms of exports with a total of about \$150 million each (1998). Other economic activities include agriculture and farming-husbandry. All these economic activities, coupled with urban development, are important stressors on the estuarine ecosystem. Key ecological issues in the marine ecology include overfishing (high artisanal and commercial fishing pressure), intense aquaculture -particularly salmon farming, declining yields of benthic and pelagic resources, declining biodiversity, eutrophication and water quality deterioration.

Salmon farming has been singled out as one of the most important ecological issues in the Reloncavi Estuary. Its negative effects have been pointed out in three areas: (1) direct chemical and biological effects (e.g., eutrophication), (2) indirect biological effects (e.g., introduction of exotic species and diseases, biodiversity decrease), and (3) social effects (e.g., farms and facilities interfere with sports and artisanal fishing and recreation). However, IACERE team member Doris Soto noted that salmon farming in Southern Chile has some positive effects, other than economic, on the biological-ecological area. These positive effects include sustainable alternatives to overfishing, increased pressure for

clean waters, opportunities for research funds, and contribution to increased biomass for sports fishing and for coastal fisheries.

## VALPARAÍSO REGIONAL ECONOMY AND COASTAL ZONE

In addition to the southern rural but rapidly industrializing region of the Reloncavi/Corcovado estuarine system, the conference included in its analysis the Valparaíso central regional economy, especially the highly urbanized and industrial city of Valparaíso and its metropolitan suburban area. Valparaíso Governor Raul Allard and Dr. Mario Muñoz, Director Regional de Obras Portuarias had indicated in an overview presentation to IACERE during a joint FLACSO/ACSS-IACERE October workshop in Valparaíso that the Governor's office was undertaking a major revitalization project of the province, which has stagnated over many decades, being overshadowed by the development of other ports in Chile. These revitalization efforts to face the challenges posed by globalization require new infrastructure. For example, then Governor Allard was working on setting up specific plans to restore and expand the Valparaíso harbor and port, increasing their capacity and enhancing their regional and economic importance. However, in his discussions with the IACERE team Governor Allard expounded his concerns for revitalizing his province within the context of a managed ecosystem with scientific inputs. The subsequent November 2003 conference addressed these issues with leading figures from the public sector and academic colleagues from Valparaíso/Viña del Mar.

(2) The main research policy areas that are most relevant to issues affecting Chilean coastal areas, e.g., infrastructure development (especially ports, bridges, and dams); natural resources, including fisheries -especially an analysis of the traditional commercial fishery as well as aquaculture, the ecological impacts of mining, deforestation; the development of the energy sector; human settlements including urbanization and suburban sprawl; agricultural activities; and the development of tourism and recreational activities. We identified the major developments in the coastal areas especially those that are most indicative of ecological impacts.

Most of these human activities become stressors to ecosystems and their resiliency; one area where this is particularly relevant is in water quality, i.e.: How much nutrients, for example, can a bay accept before changing its trophic status? IACERE team member Doris Soto pointed

out that in the Chilean case several models had been developed to estimate the carrying capacity of lakes as well as coastal bays. The question is whether or not these loads are large enough to produce eutrophication. Current research indicates that further study must determine the relevant processes and interactions among the key components of an ecosystem to be able to identify the key to the resilience of the system. The conference complemented IACERE's research in this area.

(3) Setting up a comprehensive coastal zone policy research agenda, prioritizing main areas of study and policymaking.

## BRIDGE OVER CHACAO CHANNEL

We discussed the proposed construction of a 2.5 kilometer long (29 meters wide) bridge over Chacao Channel. This bridge, to be mainly financed by private investors who will collect tolls, is a vast multi-million dollar project. It will connect the Island of Chiloé with the mainland by 2006 allowing passengers to cross the Chacao canal in only five minutes. What are its likely ecological, economic, social and political impacts? How will this rapidly changing region with the country's largest aquaculture industry and major forests be impacted by the new bridge? How will population dynamics change after the construction is completed? Are we likely to see rapid change that destroys the region's sensitive ecosystem?

IACERE-Chile team members Fernando Jara and Ronald Hellman made presentations during the joint FLACSO/ACSS-IACERE conference on the Chacao bridge project that will connect Chiloé Island with Chile's mainland and its impact on the Reloncavi/Corcovado estuary and coastal ecosystem. Professor Jara, who has had first-hand experience on how environmental impact studies are conducted for the building of the bridge, analyzed the case in a comprehensive regional economy context, pointing out the importance of ecological and economic factors that included the system's capacity for fresh water management (how will this be impacted by the construction of the bridge); he also discussed the land/coast interface, particularly the relationship between forestry and the management of the estuary with regards to aquaculture and farming, emphasizing IACERE's concern with cumulative impacts. Other public sector officials and their academic colleagues from multi-disciplinary backgrounds (Social and Natural Scientists) analyzed the ecological impact of the Chacao bridge from different angles, including the economy and legal regime.

## MEJILLONES MEGAPORT COMPLEX

The conference's integrated economic and ecological approach closely examined the Northern coastal area where the main issue is the building of the Mejillones Port Complex. The Megaport, originally proposed by CODELCO, the giant state copper mining company and the private Escondida for shipping their products, it will be the largest port in Latin America, serving as well the needs of Mercosur to ship regional products to Asian markets -given the growing trade between Latin America and Asia. The new seaport complex at Mejillones will be located north of Antofagasta. The reason Mejillones was chosen for this megaproject is its geographical location, the Mejillones Bay, protected from winds, is deep enough to facilitate construction and is strategically positioned, best not only for Chile but for Latin America.

In conclusion, the FLACSO conference provided a unique comprehensive and integrated analysis of Chile's coastal zone ecosystems, using IACERE's framework of analysis and data on the comparative understanding of estuaries. We geographically identified specific coastal/estuarine ecosystems (e.g., Reloncavi), and how they are being affected by specific human activities, e.g., infrastructure building (bridges, ports and dams).

One important measure of the ecological impacts on the coastal zones that we focused on was water quality, particularly nitrogen and phosphorus inputs (levels of eutrophication). Since any measure to manage the coastal zone has to come from the policy domain, we analyzed in-depth Chile's political system regarding ecosystem policy; here IACERE's comparative method addressing the fundamental parameters for understanding the changing political dynamics (new actors, new roles, new political alignments) of coastal zone management was particularly helpful. IACERE's method on the issue of governance focuses on the role of science into economic, social and ecosystem policy. The governing structures, particularly in the areas of legal regime, enforcement mechanisms, accountability and de-centralization must reflect the new political alignments that have resulted from the new trade regime, globalization and their ecological impacts. Policymaking must increasingly rely on scientific knowledge and inquiry, hence an integration of science into the policy making process. Our goal was to analyze how Chile's governing structures are responding to these challenges. We are pleased that this volume presents the results of this conference in a book-length publication now published by FLACSO.