REPORT ABOUT PUBLIC POLICIES AND GOVERNANCE EVALUATION FOR THE HUMBOLDT CURRENT LARGE MARINE ECOSYSTEM SUMMARY

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INTRODUCTION

Since the 1990's, Chile has experienced significant progress related to its democratic consolidation. As a consequence of such process, the country is currently experiencing a major increase regarding its social demands and expectations, as far as the improvement and strengthening of institutions is concerned. Such demands are related both to integrity and openness on the part of the government, together with an increased level of involvement on the part of citizens in their decision-making processes. Along a similar line, in the last two years important social movements have emerged, and these have expressed the necessity to perfect 'governance' processes even more. Such 'governance' processes involve, among other elements, the degrees of intervention from the Estate, its efficacy, quality and adequate orientation[1].

Public policies and governance in Chile as connected to the Humboldt Current Large Marine Ecosystem (hereafter, HCLME), are not exempted from the influence of the phenomena explained above. The search for opportunities to improve the management and conservation of the marine ecosystem in the long term must consider these new elements. In addition to the demands regarding education and the acceptance of the indigenous community, the concern about quality and preservation of the environment has been set in the public agenda and it seems to constitute a topic of interest for citizens.

Such interest accounts for the currently growing amount of social campaigning, which has primarily placed its focus on projects which are both connected to infrastructure

[1] In addition, 'governance' is understood as those ways, practices and contents which organize political openings and making decisions to answer demands and conflicts in society. The institutional performance refers to the government's capability to bring the answers to actions under legality and legitimacy in a democratic framework. (Saldomando, 2009).

development, and energy. These areas of interest represent the main factors to consider in order to establish strategies and policies in such topics.

On the other hand, the active campaigning found in other public and private stakeholders not only allows to define goals by consensus, but it also has an effect on policies legitimacy and on the acceptance from the community.

In this way, the recent modification to the *General Environmental Framework Law* represents a great deal of progress. Such modification expands the active legitimization for all people to participate in the evaluation of projects holding environmental impact, including legal for-profit organizations. At the same time, both the ratification and application of *ILO Convention 169*, and the law related to the indigenous peoples' marine and coastal zone (ECMPO), have significantly contributed to the empowerment and participation of social classes which had not been previously involved in such decision-making processes. This broadening in participation and information in the whole community has become paramount so as to obtain legitimacy and avoid interruptions in developmental initiatives due to legal actions or citizen protests.

In connection to the economic activity in the HCLME area as related to the direct or indirect resource exploitation, the vast majority of the investment projects are found in the mining and energy[2] areas. Regarding mining, some progress has been made, namely:

(i) modifications conducted on secondary quality regulations of sulfur dioxide (SO_2);
(ii) regulation, measurement and control of emissions, and;
(iii) regulation of contaminants related to wastewater discharges in sea and continental water, whether superficial or subterranean.

Still, some gaps remain in relation to the economic pressure over the marine ecosystem in the HCLME area. The energy area also constitutes an important part of the environmental pressure on the zone at hand. Some of the deficiencies existing among governance gaps present in this area relate to particle emissions control and, similarly, in measuring the

[2] SOFOFA Research Department “Record of Inversion Projects 2011”

impact produced on the ecosystem by groups of electricity generation projects and especially the thermal power stations installed on the coastline.

All of the above adds up to the fact that nowadays, every project is considered separately when measuring its impact on the ecosystem; **there is a lack of a holistic view which would allow for the quantification of the whole impact of an area on the marine ecosystem.**

In relation to fishing and aquaculture, both areas have experienced important changes and unforeseen events in the last years. The recent modification in fishing regulations represents advancements and reforms in what the governance matter in fishing resources is concerned. Such regulations establish global amounts of fishing that are set by scientific data and as a mechanism to protect vulnerable marine ecosystems involving trawling restrictions.

On the other hand, aquaculture now tends to rise its production, especially in salmon and trout, after a period of crisis due to the appearance of ISA virus that exposed the limitations of public capabilities with respect to supervision and control in the management area and also on the availability of resources for scientific research.

These aforementioned situations account for the necessity of a more effective interaction between governance mechanisms and the activities connected to the direct or indirect use of the HCLME resources.

Such interaction involves improving the performance rates of public policies on the marine ecosystem and, at the same time, **more effective communication between stakeholders involved in the economic activity, policy management and community relations which impact the coastal area.**

At the same time, the required paradigm change needed to promote a governance model that is based on the characteristics of the marine ecosystem, demands greater efforts in terms of international cooperation and coordination. In that sense, and as considered as a basis on the HCLME future management, it is appropriate to reassert the need for cooperation between Chile and Peru.

Today, the bilateral situation between these two countries has been strongly influenced by expectation and uncertainty regarding the outcome of the ongoing border dispute in the

International Court of Justice in The Hague, which will be resolved by mid this year. Although the governments of both countries have expressed their willingness to strengthen the economic cooperation and economic exchange whatever the trial's result is, concerns have risen regarding the possible economic impact on the Humboldt Current area (especially the fishing sector), which may in turn appear as a result from a verdict which may modify the status quo. As a useful proposal, a joint effort related to the conservation of such area may represent an opportunity to strengthen the cooperation to leave behind such conflicts.

Referring to the politic context of both countries, it should be considered that in the last two decades Chile and Peru have consolidated their democracies and significantly improved their standards and governance practices. Chile's incorporation to OCDE compels it to upgrade its standards and level up with those of developed economies. Such advancements related to regulation, governance practices, sustainability and management. As can be understood, the search of common actions regarding the ecosystems conservation should satisfy such standards generating important improvements for the region and laying the grounds for the effective application of the ecosystem approach toward the area at hand.

In relation to the aforementioned issues, it is relevant to ask oneself about the economic and sociocultural importance represented by the activities related to HCLM that both countries engage in, so as to take these elements into account when establishing cooperation strategies between areas. Also, it is necessary to identify the priorities of the public agenda and the level of knowledge or social bonding on the part of the community, politic and economic stakeholders regarding the necessary actions and plans to restore the damage on the ecosystem and/or protect it. On this matter, from 2010 the Chilean government and particularly the Environmental Ministry have developed a group of actions that tends to protect biodiversity.

Hopefully, in the next few years the country will develop new regulations which compel, among other requirements, to compensate for biodiversity net losses, thus complying with

current International Finance Corporation (IFC)[3] standards. On the other hand, and still relating to governmental priorities, **the innovation and competitiveness encouragement constitute one of the key factors in the effort to fit together the preservation and protection of ecosystems with the necessary economic activity for the development of the country.** Chile has implemented initiatives which tend to the search of solutions in the field of innovation and the incorporation of technical elements and scientific data in the decision-making process. For example, the national strategy for innovation and competitiveness encourages the interaction between the scientific world and the private sector. Historically, innovation in Chile has dealt exclusively with the academic research area and the participation of the private sector in innovation is low as compared with the OCDE standards. For this reason, the authorities have adopted measurements to improve the dynamics between the industry and the scientific community with the purpose of granting the country a more relevant place in the market.

In this context, in 2010 The National Council on Innovation for Competitiveness (CNIC) prepared an innovation and competitiveness agenda 2010-2020, which is assigned to lay the grounds of an action plan for innovation in Chile. This initiative can be broken down into five main ideas: (i) to strengthen business innovation; (ii) to generate scientific capabilities with strategic orientation; (iii) to develop quality human capital in all levels; and (iv) to strengthen the development in the third mission of universities, this means, to contribute to the economic progress in the country and consolidate an institutional basis for innovation.

In connection to this point, it is worth mentioning the relatively recent incorporation of private universities in the scientific research area; this contributes to the improvement of scientific capability with higher standards and cutting edge criteria and data in the formulation of strategies and public policies. In spite of these progresses, there are still important gaps relative to the effective communication between the scientific community and decision-making authorities, particularly in matters of action referring to the conservation and exploitation of the marine ecosystem.

[3] http://www.ifc.org

Finally, together with the improvement of decision-making processes and the priorities and activity areas, it is appropriate to make a cost-benefit analysis of the protection measurements to determine the financial alternatives for the implementation of such plans.

A comparative analysis of the mentioned points in connection with the governance policies and structures of the countries bordering the HCLME will allow establishing an appropriate strategy to improve the currently existing plans and suggest institutional reforms that make possible the implementation of the ecosystemic approach in the area.
In other words, the identification of common interests and objectives will allow for implementation of the appropriate decision-making patterns to the uses and needs of the local communities and ecosystem.

Background

During the past few decades, Chile has been implementing policies and guidelines meant to protect the marine ecosystem, natural equilibrium and help alleviate the ecological damage which has appeared as a consequence of over-exploiting and polluting these marine ecosystems.

In respect to the sustainable management of the Humboldt Current, the main judicial and institutional tools have been developed since the 1990's. Among these, two regulations stand out: the Fishery and Agricultural Act (Nº 18.892 de 1998, modified in February, 2013), plus the formulation of the new Chilean Environmental Institutionalism (*General Environmental Framework Law* Nº19.300).

Nowadays, the Chilean institutional framework concerning the use and exploitation of the coastline is composed of various Ministries, such as the Ministries of: National Assets, Public Works, National Defense, Economy, Reconstruction and Development, Agriculture and Secretariat of the Presidency. These, in turn, encompass organisms and or public service entities whose functions refer to the administration and management connected to the development of the different aspects of the coastline use (zone division, aquaculture, preservation).

Scientific area

Chile has a wide tradition relative to scientific research in marine sciences. In this respect, the development of the first Marine Biology Station of South America in Montemar, 1948 (located in what has come to be known as the Marine Sciences of *Universidad de Valparaíso*) stands out.

In the early 2000's, new regional research centers were created: the Center of Oceanographic Research in Eastern-South Pacific (COPAS) of *Universidad de Concepción*, created in 2002 in response to the country's need to reinforce and consolidate the possibilities of conducting high quality research on marine sciences.

Currently, there are 11 universities all over Chile that offer the Marine Biology study program. The teaching of it is presented both at pre-graduate and postgraduate degrees. In addition, scientific research on this area is conducted complying with first level standards.

Along a similar line, Chile is a member of different committees, and has subscribed several treaties on marine sciences and natural heritage. It is worth noting, among these, the Permanent Commission for the South Pacific (OPPS), coordinating entity in charge of the marine policies of its advocate states: Chile, Peru, Ecuador and Colombia. Its mission consists on "coordinating and fostering the marine policies of the member states for the preservation and responsible use of natural resources and their environment, so as to benefit its peoples' integral and sustainable development".

Chilean protected areas

The Chilean government is currently working on a GEF project, "Creation of an Integrated National System for Chilean Protected Areas: financial and operational structure". Its main objective is to create and implement a National System for Protected Areas (PA), both terrestrial and aquatic, private and public, which can also adequately represent the nation's biological and cultural diversity, so as to guarantee both the appropriate protection of natural processes, and the ecosystemic services supply, for the country's sustainable

development, in order to benefit current and future generations. Its implementations began in 2009 with a working limit set in 2014[4].

The Chilean currently protected areas are as follows:

Nature Sanctuaries, Marine Parks, Marine Reserves, Management and Exploitation for Benthic Resources (AMERB), Marine and Coastal Protected Areas for Multiple Uses (AMCP-MU), The Indigenous Peoples' Marine and Coastal Zone (ECMPO), Preferential Areas for Recreational Fishing, Private Protected Areas and Genetic Research Areas, identified as areas located in marine waters or continental, in which limits are set regarding the species present or the extraction methods concerning hydrobiological resources.

One of the main gaps in the protected areas system is its difficulty to grant equal levels of importance to the economic, social and biological criteria when elaborating its boundaries.

On the other hand, the absence of an organism that comprehensively coordinates those public institutions which have a direct influence over certain protected areas and their biodiversity, significantly increases the response time on the part of institutions. As a direct consequence these institutions must double their efforts to achieve common objectives. This point comes to be particularly relevant when considering the development of scientific research, given that in order to work in a protected area, and depending on the *taxa* objectives of the research, the permit applications may include four or even more institutions.

[4] www.proyectogefareasprotegidas.cl

Analysis of the main activities and uses directly linked and their impact on the ecosystem

The main activities which produce a direct impact on Humboldt's Current ecosystem can be divided as follows:

Intensive Aquiculture: The challenges faced by Chile in this sector refer to the following points: a) the improvement and environmental sustainability related to the productive process; b) the stable availability of goods such as seeds, food and vaccination; c) ensuring products' quality as required by international standards; d) increasing of value added in goods; e) new markets openings; f) new products development, and g) more cultivation areas available.

Fishing: The effect of fishing in marine ecosystems comes to be seen in the removal of a significant part of the food chain biomass, which may lead to a complete scarceness of resources. Similarly, *by catch* reduces the available biomass for the highest trophic levels, as well as in the biodiversity chains. On the other hand, *by catch* may affect birds, marine mammals and other endangered species. Several scientific studies have proven the effects of longline hooks fishing and death rates of seabirds that get stuck on fish hooks. For this reason, several international organizations have joined efforts regarding the preservation and protection of species such as the Albatross Task Force, developed by the Birdlife International.[5] On what fishing wastage is concerned, its organic nature may affect the quality of water and the trophic structure.

Finally, there may be alterations to the ecosystem's proper conditions, and its population may be affected by diseases. (UNESCO, 2006)

Mining: Chile is a renowned mining country. This is mainly due to two facts: on the one hand, the place of the mining activity in the country's economic development, and, on the other, because it constitutes a type of labor in which most of the territory engages in – though the majority is in the North.

[5] www.birdlife.org

In terms of Chile's Gross Domestic Product, the whole of the mining sector represents around 7% of it. Copper in particular, corresponds to 82% of the mining Gross Domestic Product. (MMA, 2009)

Mining activity's impact on the marine ecosystem can be verified through the discharge of polluting substances, such as hydrocarbon, lubricants, and metals, into the water column, together with the sediments suspension which may alter the luminosity that enters the water, and diminishes primary distribution. Besides, the changes produced by accumulated sediments may: a) affect the quality of the benthic habitat; b) reduce biodiversity, and c) lose or fragment the habitat (UNESCO, 2006).

Heavy metal bio-accumulation[6] on the part of benthic organisms which constitute fishery resources such as bivalves, may generate a potential impact on human health due to the consumption of such products by the Chilean population (Ramírez et al. 2005).

Energy: In Chile, generating electricity relies to a great extent on CO2-emitters fuel types. This also involves local or global effects which are "related to the emission (or reduction in CO2 capture) of greenhouse gas (GEI), thus contributing to its global concentration and to climate change"[7].

As far as public policies for this sector is concerned, the recent formulation of the National Energy Strategy accounts for the political willingness to advance in the search for more sustainable technology types.

Regardless of these efforts, strong impact prevails in connection with the impact of thermo-electrical production on the marine environment. In the first place, thermo-electric power stations are high CO2-emitters. CO2 produces a significant impact on global warming and in oceans' acidification processes. Carbon dioxide plus sea water produce carbonic acid, which then increases water acidification, consequently making its pH drop. This reduces the amount of carbon dioxide which would be available to be used by marine organisms.

[6] For a further discussion check Cortes, Sandra et al, 2007.
[7] Ibid

One of the most important functions of carbonate is the production of calcium carbonate and limestone structures. They form coralline skeletons, shells –even those belonging to some of the plankton-based, marine organisms, and pearls (OCEANIA, 2010).

Secondly, coal combustion expels mercury in gas form, which in the moment it touches the ocean it bio-accumulates and bio-magnifies in fish and shellfish through the trophic weave.

In connection with the coastline ecosystem near the power stations, water suction used in cooling systems and its subsequent discharge into the ocean at high temperatures causes fito and zooplankton to die, which also affects the ecosystem. Equivalently, this water suction fosters exotic species colonization in areas located outside their normal distribution, which once more, modifies the ecosystem (e.g colonies of tortoises in Mejillones).

In contrast, the release of particular matter into the air gives origin to negative effects on nearby communities, and on the coastline flora and fauna.

In other words, species or endangered populations may be directly affected, or else the coastline landscapes may also suffer some damage.

Finally, sediment-related pollution may alter the seawater chemical properties.

Agriculture: The biggest impact on HLCME can be found in the discharge of polluting agents such as pesticides, organic water enrichment due to fertilizers, and the accumulation of superficial sediments. Likewise, the insertion of slow deteriorating toxic substances might enter the food chain through bio-accumulation, and hence become a threat for the population.

The most serious threats for the agricultural and livestock related activity are represented by: (i) coastline waters eutrophication; (ii) hypoxia, and its consequent biological components mortality rates; (iii) contamination and deterioration of the marine system, and (iv) changes in the system which may alter the ecosystem's physical characteristics, such as salinity and local currents, therefore affecting productivity and biodiversity in the impact areas (UNESCO 2006).

Tourism: Chilean coastline areas represent an important touristic, seasonal activity. The most visited areas correspond to the IV and V Regions.

The growth of the touristic activity, together with the rise in residual discharges onto the ocean have caused a decrease of critical habitats, due to urban expansion and leisure-related activities. The following are some of the environmental consequences:

(i) fragmentation of beach ecosystems, coastal dunes and wetlands; (ii) architectural barriers; and (iii) difficulties in free access to beaches (Castro et al. 2009).

On the other hand there has been a **decrease in those traditional activities which are developed in accordance with the preservation of the coastal medium and its resources, such as inshore fishery, agriculture and cattle industry**.

A significant impact may be caused on the evolution of the touristic activity in relation to its infrastructure, namely marine, coastal defense, roads, cities and residential areas, alongside with municipal sewage, recreational fishing, sailing, diving, and ecotourism in protected areas. As a matter of fact, these activities cause coastal habitats to disintegrate, together with an augmentation in the amount of sediments in suspension, and an increment on the amount of coliform bacteria, pathogens and disease vectors in water.

Marine Transport: Referring to the impact on ports and marine transport on coastal and marine habitats, these effects are visible through the changes in the quality of water, in hydrology, pollution and removal of sediments, material dredging and discharge, plus sediment contamination originated from oils and heavy metals. Ballast water discharge coming from other latitudes, which often carry plankton organisms, may cause the latter to proliferate and compete with the indigenous fauna and flora. Some cases of Harmful Algal Blooms (HAB) or “red tide” have been recorded, related to the presence of dinoflagellates which have arrived to the area in this way (CONAMA 2001).

The cited phenomena may in fact alter marine habitats structures and inflict damage onto species biodiversity. As a matter of fact, most sensitive species tend to migrate toward different areas or else disappear altogether. Lastly, chemical products and fuels loss may bring about changes on the seabed, a growth in the amount of materials in suspension,

and murky waters (UNESCO, 2006). Similarly, there is a higher risk of incorporating exotic fauna being transported inside ships' holds. Some examples are vertebrates like amphibians, reptiles, birds and mammals.

Decision-making Methods Analysis and Governance Policies Evaluation

Description of the Design Process, its implementation and policy evaluation

An effective and efficient type of government should possess appropriate design functions, together with its related implementations methods and public policies evaluation tools. A government should have them separate so that the possible conflicts of interest on the part of the participants do not affect the policy quality. Additionally, such system should offer citizens suitable representativeness mechanisms and dialogue instances.

Policies and Governance National Evaluation

Chile states in its legislation[8] that it wishes to reach economic and social growth while respecting environmental equilibrium. In order to achieve this goal, Chilean public institutions must possess elements which would allow for the design, implementation and evaluation of policies that follow those lines.

Policy elaboration: In this function it can be pointed out the public institutions which represent the specific interest of an area are delineated. Moreover, the existence of Councils of Ministers guarantees that public figures can coordinate efforts so as to formulate policies directed to develop a sustainable national development.

On the one hand, the Council of Ministers must formulate cross-sectoral policies, and, on the other, it must define which sectoral policies must be subject to environmental strategic evaluation. Councils must, in addition, listen to citizens in order to identify their needs.

Institutional structures have to account for those characteristics a modern state should be composed of. Nevertheless, institutional mechanisms are still recent[9]. More time will be required in order to elaborate on their results. To evaluate these institutional structures, the

[8] Political Constitution of the Republic of Chile and General Environmental Framework Law, among others.
[9] They have not yet been in application for a whole in year in the present government.

following points, among others, will have to be considered: (i) whether the representativeness mechanisms have proven to be satisfactory[10]; (ii) whether if, taking into account the existence of these mechanisms, public policies for the Humboldt Current area are in fact, priorities for citizens, and (iii) whether the state organisms are able to conceive policies that account for the complexity involved in carrying out a sustainable development in the area at hand.

Policy Implementation: As far as policy implementation is concerned, prospects appear not as promising as could be expected. Two elements may provide an explanation, namely: (i) the focus of policy formulation has been more on the formulation of laws and regulation rather than on programs which implies a lack of coordination between developed programs that come to be implemented sectorally, and (ii) an important part of implementing policies entails implementing bureaucracy processes between the private sector and the State. Such processes can still be quite extensive for each party, and many a time, the results may be uncertain.

Policy Evaluation: In policy evaluation other participants of civil society are included. Some of these actors are inclined toward protecting the environment, whereas others, who are part of the economic area, do so toward fishing and aquatic activities. Among these actors the common elements are, in the first places, that their opinions have to be taken into account so that their interests can be respected, and secondly, that their sectors have the ability of organizing themselves in order to foster institutionalism. There are no public actors whose role is that of ex post policy evaluators, or at least if they do exist, their relevance is not noticeable.

The aforementioned situation presents a possible explanation for the deficiencies found in the representativeness mechanisms. On the one hand, there are groups who in spite of engaging in activities with negative externalities in the area, are not required to offer compensations. Such groups are not presented with incentives that may draw them into participating, given that the current status quo is beneficial for them.

On the other hand, there are other groups, who in spite of having incentives to participate,

[10] As will be shown in brief, the kind of actors that take part in the monitoring function would indicate that, until now, such function has not proven to be satisfactory

doing so also involves extremely high costs. Inside this group, we find particular case for tourism-related businesses. In sum, regarding the monitoring aspect of policies, one can find actors who, despite having enough social, political or economic power, still receive incentives to participate. In the end, such solution does not constitute a way to account for the set of interests that should play a part in this policy evaluation process.

Coordination among functions: Regarding the HLMCE system, its related formulation process is linked to the implementation of public policies as far as regulations are concerned. However, this process appears as weakly connected to programs and plans.

In this sense, the kind of implementation process in point, is one that does not generate information which accounts for evaluation; such evaluation, in turn, is carried out by civil society and study centers. Those in charge of designing policies, do not make the most of the information gathered through this evaluation. In conclusion, improvements in this area are of paramount importance.

Policy and governance indicators

In order to evaluate Chile's results of the policies related to the Humboldt current, three elements must be taken into consideration: (i) governance quality; (ii) level of development, and (iii) environmental preservation.

The following indicators represent a way to measure these three aspects:

Economic Development Indicators

Objective	Indicator
Economic Development	Economic value
	Foreign direct investment
	Economic diversification

Governance Indicators

Objective	Indicator
To ensure suitable public policies	Existence of a representative coordinator mechanism between policy makers
	Existence of a separation between design functions and policies implementation
	Existence of a separation between implementation functions and policies evaluation
	Existence of procedures which guarantee efficient regulations
	Existence of a regulatory framework for the area
	Existence of programs and plans for the area
	Existence of management plans[11]
	Existence of regular policy evaluations and redesign
	Existence and dissemination of scientific research
	Existence of a participation mechanism involved in the process of policy formulation on the part of stake holders (economic, ONGs and local communities)
	Incorporation of the area in consideration with sustainable development strategies

[11] A management plans consists of a plan which, at a detailed level, establishes those activities which can be performed in a particular marine zone, apart from those activities that are needed in order to prevent, control, compensate and correct the possible negative environmental effects or impacts that have caused as a result of such activities.

Environmental Indicators

Objective	Indicator
To preserve the ecosystem's structure, quality and operation.	Biological diversity
	Species distribution
	Species abundance
	Species production and reproduction
	Species mortality rates
	Trophic interactions
	Species health status
	Quality of climate
	Quality of habitat

As was mentioned before, there is a lack of monitoring and evaluative mechanisms related to public policies in the area of Humboldt's Current. Therefore, creating these is one of the recommendations that, if taken into account, would allow for the existence of an improved governance. In order to achieve such enhancement, the following aspects would have to be taken into account: (i) identifying and/or creating institutions in charge of the monitoring and evaluating functions; (ii) identifying relevant available information; (iii) systematizing such information; (iv) formulation of new information when it is not present; (v) designing and implementing transparency criteria which may foster citizens' accountability; and (vi) communication channels with those who design these policies, so that the information that comes from monitoring and evaluating can be used in design and redesign processes.

STRATEGIC ANALYSIS OF POLITICAL, LEGAL AND INSTITUTIONAL REFORMS, AND DEVELOPMENT OF A NATIONAL GOVERNANCE MODEL

Coherence in the application of relevant national and international regulations

Chile has signed several international treaties regarding Environmental Protection. Most of these treaties and international conventions are what has come to be known as program regulations, which do not stipulate the enforcement of sanctions as a result breaches. In this sense, the application and enforceability of such agreements depends largely other internal norms which may in turn, make their application effective.

All of this will lead to an analysis regarding to the extent which the sectoral decline in the hand of various authorities, who make use of a general international tool, proves to be an adequate context for implementing the ecosystemic approach in Chile.

Facing such situations, which are replicable throughout all regulations referent to environmental protection, there are three possible approaches (Burroughs, 2011), namely:

i) The choice of maintaining the sectoral regulatory approach in such a way that its techniques may be improved at the level of each of the sectors involved in the activity.

ii) The partial application of the ecosystemic approach onto particular activities of the sector at hand. In this way, sub-areas located in sector can be found in order to apply the main focus of the ecosystemic approach in a successful way, and thus progressively influence the whole of the activities of the area at hand.

iii) To generate modifications starting from the top, which means establishing guidelines which would both obey to regulatory implementations and interpretations, and/or to policies that are relative to the ecosystems.

Institutional Reforms Proposal

The Ministry of the Environment is the main organism in charge of dealing with governance matters of the ecosystem under discussion. Concurrently the role of both the Council of ministers for Sustainability, and the Inter-Ministerial Commission on Climate Change, is of extreme importance. In fact, such organisms would benefit enormously if they chose to integrate each other's agendas and incorporate perspectives oriented to strengthen public policies and legislations that are in direct connection with HLCME management and with the implementation of the ecosystemic approach.

At a local level, institutions should consider their participation in these communities. They should also be extremely receptive to the guidelines originated from national strategies. In such sense, regional governments and city halls are the main actors given that they constitute the closest institutions in relation to citizens, and these also have a relevant influence on budget allocation when it comes to regional projects, projects which might incorporate sustainability and management criteria as considered from the ecosystemic viewpoint.

In the process of general advancements regarding governance policies and tools, the fact that institutions start laying the foundations for a joint and coherent application of policies, seems to bear more relevance than just addressing the subject from the point of view of a simple implementation of structural reforms at the institutional level.

With the purpose of establishing common ground for the Estate to take actions, some elements have been identified as those which can and should be taken into consideration when implementing improvements in HCLME management. These elements are as follows:

a. High levels of support on the part of citizens regarding environmental issues

In the last few years, several social movements and demonstrations have sprung in Chile. Some of these have focused exclusively on environmental issues; demonstrations and rioting dealing with *HydroAysén* and *Punta de Choros* projects are some examples of this situation. Such events have come to show that these days are simpler to sensitize citizens in respect to sustainability and climate change topics.

b. Environmental regulations quality

Relative to environmental matters, Chile possesses a strong regulatory framework. There have been important advancements in this respect in the past few years. Some gaps still remain regarding supervision (e.g., in aquaculture), and in the upgrading of the requirements of control, as compared with environmental regulations at the international level.

c. Institutional ability for long-term policies definition and management

Among the major gaps present, a large deficiency in establishing long-term policies is found. Chile does not possess neither mechanisms nor institutions which would allow for either some kind of strategic planning or the generation of developmental objectives which may lead the decision-making process. It is at this point that an imperative element must be highlighted: that of **generating policies and objectives which may guarantee the maintenance and consistency of such policies beyond the orientations of the particular government in office**.

d. Cross-sectoral coordination and communication channels

As was previously explained, **the general coordination of public policies it is an element liable to be improved**. In fact, the application of a certain policy is connecter to different institutions, each of which proceeds on to its application according to their own viewpoint and agenda. Along this line, **strengthening communication channels following a top-down fashion**, constitutes a fundamental step for achieving efficient public policies, especially those that deal with ecosystems, since their management requires a reliable and updated data and information flow carried out in the field.

e. Relation holding between universities/public sector/public sector

It has become necessary to improve the relation holding between universities and public policies. In universities, there is an a priori main consideration, which consists on improving their scientific production and increasing their offer regarding their study programs. On the other hand, the public sector prioritizes the solving of various multidimensional issues in which different actors and participants are involved.

Therefore, interest on the public sector can hardly help universities achieve their goals regarding published works and scientific development. In consequence, **an additional effort must be made in order to establish a strong link between the academic activities and those needs present in the public sector, so that the decision-making process can be improved as well**.

f. Incentives for the private sector

Within the reforms that are suggested in order to achieve the goal of implementing the ecosystemic approach in the HCLME zone, there are several tools which may be able to **facilitate investment, particularly those investment decisions which come to be necessary for companies to comply with more sustainable stipulations.**

g. Reinforcement of of monitoring and control tools

There are still various gaps in aspects that relate to monitoring public policies and environmental plans. Likewise, in the context of those international agreements that have been Chile has ascribed to, overcoming these gaps has come to constitute a fundamental issue. This is due to the fact of the prospect of an increase in both national (on the part of citizens) and international (international and financial organisms) pressure, which would therefore push the country to adopt and follow those regulations that are meant to protect ecosystems and make their sustainable use possible.

HLCME MANAGEMENT SWOT ANALYSIS

STRENGTHS	**OPPORTUNITIES**
• Extensive tradition in scientific research in the area of Marine Sciences; • Extensive literature available on Humboldt Current's ecological processes; • Suitable operation of scientific research centers, which are capable of conducting first level research on marine sciences; • Existence of non-governmental organizations (ONGs) which focus on studying various *taxa* and on preserving marine environments; • Research grant funds available (0,5% out of the GDP according to OCDE 2012 survey).	• Establishing numerous protected areas which are liable to be the focus of research; • "Census of Marine Life- Chile (CVM-Chile)" Project, whose objective is to take a census of the marine species of the territory in order build up a data base containing information and a gene bank; • Incorporation of young voters who are aware of the environmental problems; • Social leverage: Young people as sources of opinion (social networks); • A strong participation and media coverage in relation to environmental crises (Puchuncaví, Punta de Choros, HidroAysén).
WEAKNESSES • Ignorance relating international projects; • Deficiency in the transmission of scientific production and those institutions in charge of elaborating policies; • Atomization in governmental efforts; • Scarce knowledge and quantification of the impact produced by industrial activities for planning. Regulation on anthropogenic activities • Heterogeneity in the parties involved; • Excessive periods of wait time	THREATS • Deficiency in the communication of data and information pertaining to the impact between private and public sectors; • Economic crisis: risk of priorities' interference; • Skepticism on the part of economic agents in relation to political appropriation; • Deficiency of public funding destined to the management and care of protected areas; • Lack of a coordinator organism which can holistically run public institutions which in turn have a direct influence on a particular protected area and the biodiversity present in it.

Transnational and international cooperation

As has been previously pointed out, Chile has subscribed to numerous international agreements that deal with protection and sustainable management of the Environment.

Chile's participation in Permanent Commission for the South Pacific, and Chile' recent incorporation as a full member to Regional Fishing Organization for the South Pacific (ORP)[12] account for these. These incorporations also represent an important chance to coordinate the decision-making processes with those of other countries in the area, especially Peru.

As a matter of fact, the influence of the aforementioned organism could contribute to the improvement in the HCLME management, because it forces it members to comply with coordination, information and transparency stipulations.

Regardless of such efforts, it can be postulated that it is necessary to reinforce even more the actions to be taken and the transnational cooperation regarding the HCLME, mainly due to its critical importance in reference to the extraction of marine resources.

To such purpose, the development of a **Permanent Commission for the HCLME**, integrated by Chile and Peru might represent a significant modification in the search for practical improvements in governance, together with a better coordination of the plans and policies of both countries.

Thus, such Commission could help establish common policies regarding the regulation of fixed exploitation rates, a coordinated establishment management measures, and to both deepen and rationalize efforts in connection to research on the ecosystem.

Along similar lines, the Commission could act as an integration fostering agent concerning the interests shared by both countries in the context of ORP.

In the framework of the structure provided by the Chilean State the Commission could also take the place of a consultant organism for the Executive, through the Council of Ministers for Sustainability. The latter would have to modify its regulations in order to be able to

[12] Chile placed its ratification tool on July 25th, 2012

enforce such rights.

In addition, it could be proposed that the creation of this new legislative-political-administrative link would allow for a more effective alignment regarding international sustainability standards.

On the other hand, and concerning the limits of its local actions, the Commission could also convene regional meetings composed of different political, social and economic agents, in order to include their needs in the formulation of their plans and policies.

- To summarize, the Commission's faculties should be as follows:
- To coordinate the public policies that deal with HLCME between Chile and Peru;
- To promote scientific research in order to strengthen those capabilities related to the sustainable management of the HLCME;
- To foster the creation of mechanisms of political coordination and cooperation at the bi-national and regional levels dealing with the ecosystem's protection and management;
- To advice the Executive in the formulation of policies and regulations concerning the HCLME.

CONCLUSIONS AND RECOMMENDATIONS

A strategic governance plan for the marine ecosystem of the Humboldt Current calls for technical support and a constant follow-up on its initiatives. It also involves the earmarking of funds and, finally the implementation of control, advancement and efficient indicators.

Such indicators can constitute: (i) performance signals which will help measure the efficiency and the environmental performance of the plan's initiatives; (ii) management measures which indicate the efforts made by the authorities and companies in order to better their ecosystemic management both in the private and public sectors; and (iii) indicators which are meant to provide information about environmental conditions at the local, regional or national levels.

The State and large companies may complement these pieces of information with management indicators in such a way so as to directly affect their environmental performance.

Finally, environmental conditions indicators are in general more effective in particularly environmentally sensitive areas, or else in those regions that can be viewed as direct factors in the emergence of environmental problems, for example, mining and energy sectors.

Once these pieces of information have been applied, the next step would be to start an evaluative process. Such process has to offer the possibility to reformulate the objectives based on the results. This step involves other sub-steps, namely: (i) to measure through the indicators the final performance levels reached; (ii) to define corrective actions which will better the activities; (iii) to prioritize actions in such manner that the intended objectives can be reached more quickly and more efficiently; (iv) to communicate the performance levels to the corresponding supervising agents; and (v) to demonstrate the improvements on the environmental development to the interest groups and to the community in general.