Management of the loco (*Concholepas concholepas*) as a driver for self-governance of small-scale benthic fisheries in Chile

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1. INTRODUCTION

Fishery policies that ensure sustainable exploitation of marine benthic resources contribute to food security, protect them and preserve the social and economic status of dependant communities (Bene, 2003; World Bank, 2006). In Chile, due to the social and economic importance of artisanal benthic shellfisheries, there has been a strong political desire to achieve sustainable exploitation in these fisheries (Castilla and Defeo, 2001). This was reflected in the 1991 Chilean *Fishery and Aquaculture Law* (FAL; D.S: 430) that regulated access to benthic and pelagic coastal resources by the artisanal fisher sub-sector. The FAL defined this sub-sector and incorporated new regulations that affect their user rights through three management steps: (a) Exclusive fishery access rights within a zone that extends to 5 nautical miles from the shoreline along around 2 500 km of coast (18º 36' S, 70º 30' W to 41º 27'S, 74º 10' W) are assigned to artisanal fishers; (b) artisanal fishers are restricted to working (diving, finfishery) within the coastal region adjacent to their area of residence (regionalization); and (c), the allocation of exclusive harvesting rights for benthic resources to legally registered artisanal small-scale fishing associations, under what was defined as Management and Exploitation Areas for Benthic Resources (MEABRs) that was perhaps the most innovative management instrument of the law (Castilla, 1994, 1996; Castilla *et al.*, 1998; Gelcich, 2005a). Through this policy, the Undersecretary of Fisheries allocates territorial user rights for fisheries (TURFS) to artisanal registered associations (Castilla and Defeo, 2001; Defeo and Castilla, 2005; Gelcich, Edwards-Jones and Kaiser, 2005a). This includes the right to exclude non-members of fisher associations from exploiting the seabed area of MEABRs.

The rationale behind TURFS is based on a common property approach which proposes that property rights will create institutional arrangements among fishers, who will then manage, collectively harvest and sustain the resources (Ostrom, 1990; Ostrom and Schlager, 1996). In addition, MEABRs should contribute to more effective enforcement of regulations by increasing the likelihood of compliance (Jentoft, McKay and Wilson, 1998; Castilla, 2007; Gelcich, Edwards-Jones and Kaiser, 2007). The MEABR model, which effectively takes the form of co-management, was derived from field experiments conducted mainly at the Estación Costera de Investigaciones Marinas, Las Cruces, Pontificia Universidad Católica de Chile (Castilla and Fernández, 1998). In fact, the first MEABR was established experimentally in 1989 (Caleta Quintay, central Chile), before the law was introduced (Castilla, 1994). MEABRs regulated

by the law began to be decreed in 1997. According to the National Fisheries Service (SERNAPESCA, 2005) there are currently 547 decreed MEABRs in Chile, with a total seabed area of 102 338 hectares.

In this chapter we highlight the importance of the gastropod *Concholepas concholepas* (loco), the cornerstone species that drove legislation on MEABRs as well as the role of this policy to achieve wider fishery objectives and generate incentives and conditions for self-governance.

2. ARTISANAL BENTHIC FISHERIES IN CHILE

The definition of artisanal and small-scale fisheries versus mid-scale and large-scale or industrial fisheries varies enormously and is country dependent (Castilla and Defeo, 2001; Berkes *et al*., 2001). The 1991 Chilean FAL defined two main fishery sub-sectors: "Artisanal" and "Industrial". An artisanal fishery is defined as a fishery extractive activity carried out by fisherfolk that personally direct and who normally work in coastal areas. For this purpose, and interpreting the law, "coastal" means the oceanic realm within the first 5 miles from the littoral line. To be considered an artisanal fisher one must be registered as such with the National Fisheries Service and fishing vessels must not exceed 18 m in length and a maximum of 50 gross register tons. Four categories of artisanal vessel/boats are defined in the Law: (a) Artisanal open boat: with or without outboard engine (most of the artisanal benthic small-scale fishery activities and artisanal small-scale pelagic fin-fish fishery belong to this category), (b) Small-vessel (*lancha artesanal*): fully covered with inboard engine and maximum 12 m in length, (c) Medium-vessel: fully covered, inboard engine and between 12 to 15 m in length, (most of the sword-fishery fleet in Chile belongs to this category) and (d), Large-vessel: fully decked, inboard engine and maximum 18 m in length (most of artisanal small-pelagic fishery fleets belongs to this category) and maximum 50 gross register tons (FAL, 1991; World Bank, 2006).

To obtain an artisanal fisher licence it is required to be registered in the *Registro Nacional de Pescadores Artesanales de Chile*; fishers are also registered for the target species they fish. Fishermen do not have to pay a fee to register to harvest the particular resources they wish to fish. Once a resource reaches the category of "fully-exploitation" within a region, no further registration for that specific species is accepted. In regard to MEABRs, artisanal fishers do not pay any form of fee, but they do have to pay a yearly fee per hectare once the MEABR has been in operation for 4 years (now about US$ 6 per hectare).

According to SERNAPESCA (2005) there are a total of 54 751 registered artisanal fishers, which depend on different resources and livelihood strategies. Artisanal fishers include: (a) Armador Artesanal (boat owners), (b) Shellfisher, (c) Algae Extractor and (d), Artisanal Fisher as such (definitions are given in the Law). The categories are non-exclusive and therefore can be used simultaneously. There are 6 920 algae gatherers, 13 199 shellfishers (including divers) and 39 995 fishers (mainly finfishers) in Chile. Currently, indigenous (first nation) groups along the Chilean coast must also subscribe to one of these categories to be permitted to extract marine resources

Artisanal fishers in Chile, irrespective of livelihood strategy or vessel type, are organized around areas of coastal land which are officially designated as 'coves' (*caleta* in Spanish). These are strips of land above the high tide mark that are granted as a concession by the state and provide rights to users, such as the right to have access to the sea, the right to land a boat, the right to land catch and to erect certain buildings (Gelcich *et al.*, 2005a). According to SERNAPESCA (2007) there are a total of 453 permanent artisanal caletas along the Chilean coast.

A subset of artisanal fishers in Chile is composed of artisanal benthic small-scale fishers (Castilla and Defeo, 2001), these extract most species of benthic shellfishes (over 60 species of invertebrates, including crustaceans, molluscs, sea-urchins and tunicates are harvested) through: (a) manual collection during low tides (Castilla,

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PHOTO 1
*Landings of a collective harvest of loco (*Concholepas concholepas*) from the MEABR at Caleta el Quisco in 2001*

Campo and Bustamante, in press), (b) skin diving and (c), semi-autonomous or air compressor ("hooka") diving gears (Bustamante and Castilla, 1987). Hooka gear fishers' activities usually involve an artisanal open-boat (5–9 m long), outboard motor (10–45 hp), air compressor and a crew of 3–4 (boatman, assistant and one or two divers). Diving trips are normally during the day, usually less than 15 miles from the base port and diving in no deeper than 25 m (Castilla and Defeo, 2001). In Chile, the most economically important benthic artisanal resources are the muricid snail *loco* (*Concholepas concholepas;* Photo 1), the red sea urchin *erizo* (*Loxechinus albus*) and *lapas* or key-hole limpets (several species of genus *Fissurella)* (SERNAPESCA, 2005; Moreno *et al*., 2006).

3. REGULATORY HISTORY OF THE LOCO FISHERY: A DRIVER FOR MEABR POLICY

The loco fishery is considered as the main catalysis for the inclusion of MEABRs within the FAL (Castilla, 1996; Gelcich, Edwards-Jones and Kaiser, 2005a; Castilla, Gelcich and Defeo, 2007). The loco fishery showed three fishery phases prior to the implementation of the 1991 FAL. The first (1960–1974) was characterized by landings of around 3 000–6 000 tonnes, used mainly for domestic consumption. These landings probably represented a sustainable harvest level for loco (Figure 1). Chile then adopted a neo-liberal policy framework. This, together with the implementation of an aggressive exchange rate policy and open markets in 1974–75, substantially improved fishing export earnings, and produced the necessary incentives for Chile to become the region's leading fish and shellfish exporter (Thorpe, Ibarra and Reid, 1999). Demand from Asian markets was constantly increasing and local credit programs created by the government provided favourable investment opportunities for new boats, diving gear and processing plants, thereby stimulating even further product demand (Schurman, 1996). At that time, as most loco fisheries in Chile operated under an open access policy, artisanal fishers, although based at specific artisanal caletas, used to migrate along the country. Thousands of divers moved around Chile, mainly to the southern regions, sparking fights between locals and outsiders in what was named at the time the "loco war" or "loco fever" (Meltzoff, Stotz and Lichtensztajn, 2002; Reyes, 1988). Between 1976 and 1981 loco landings abruptly increased reaching a peak of 24 800 tonnes in 1980. According to a Fisheries Department official, the open-access state of benthic resource fishing in Chile and the newly opened export markets

FIGURE 1
Evolution of total landings (MT) of loco including conch (shaded dots) and price (US$/MT) of loco without conch (open dots)

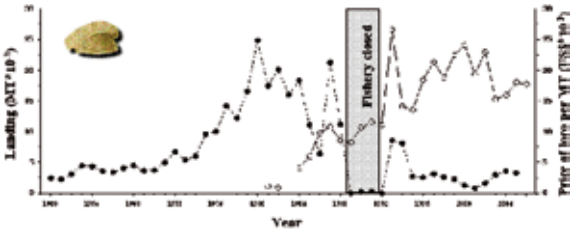
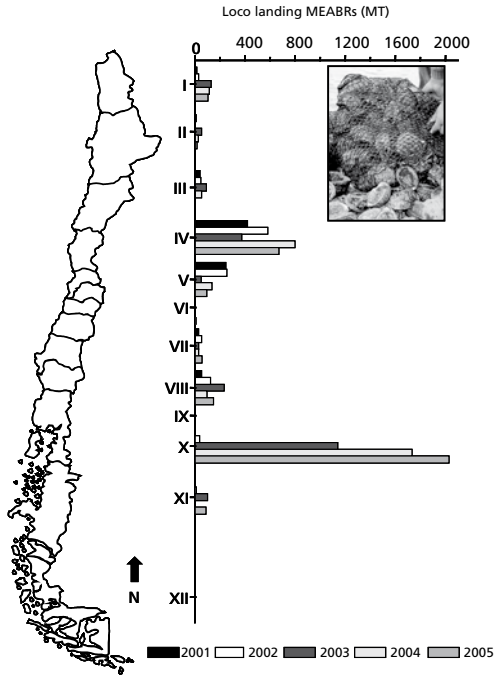


FIGURE 2
Loco landings in tonnes (locos with shell) exclusively from MEABRs in Chile across different regions (2001–2005)



were enough to lead to a "tragedy of the commons" situation (see Castilla, 1994; Gelcich *et al.*, 2005b). The loco fishery was closed between 1989 and 1992 (Figure 1).

Since 1992 the loco fishery has been regulated by the FAL and since the year 2000 loco can be extracted exclusively from inside allocated MEABRs. When harvested from MEABRs, the total allowable catch (TAC) of loco has previously been evaluated by biological consultants (final approval is made by the Under-Secretary of Fisheries) and the objective is that the fisheries are biologically sustainable. This represented a strong move toward rationalizing the fishery for loco and other benthic resources. Between 1993 and 2005 the annual extraction of loco fluctuated between 2 500–5 000 tonnes a year (weight values include conch). Landings were similar to those experienced during 1957–1974, which can be considered as a sustainable fishery period (Castilla *et al.*, 2007). Nevertheless, during the post MEABR-policy period (1997–2006) the market export value of a loco has ranged between US$ 15 000–25 000 a tonne (without conch) with an almost doubling of loco price during the open access period. These prices were in general lower during 2003–2006 as more fishery associations obtained TACs for loco. This suggests that in the past 10–11 years under the FAL management guidelines, the supply and demand market dynamics had conditions that could increase sustainability of loco fisheries operating in Chile. Importantly, biological data support the fact that MEABRs have been successful in maintaining target species. Castilla *et al.* (1998) showed that the number of loco was significantly higher in a MEABR (El Quisco) compared to nearby open-access areas. Mean sizes of individuals and catch per unit effort values were also significantly higher (for other shellfish resources see Castilla and Fernández, 1998). In addition Manríquez and Castilla (2001) have shown the importance that MEABRs and No-Take areas have as spawning grounds for the loco.

Since 2000 loco landings have risen considerably from around 1 000 tonnes to around 5 000 tonnes. Initially, during 2001–2002, Regions V and VI in central Chile contributed most loco landings. Currently, most landings come from Region X in southern Chile (Figure 2). These landings have been increasing since 2002 and have already reached more than 2 000 tonnes/yr (Figure 2). This has generated fear in caletas of central and northern Chile that prices will drop drastically.

4. MEABRS POLICY BEYOND THE LOCO: MULTIPLE SPECIES AND SELF-GOVERNANCE

The loco has formed the main fishery that has motivated the MEABR policy; in fact 85 percent of the operating MEABRs have loco as a one of the principal species to be managed (Castilla, Gelcich and Defeo, 2007). However, the implementation of MEABRs has gone beyond an exclusive focus on the sustainable harvest of loco. In this section we examine MEABR policy in terms of the number of different benthic species included in management plans and the implications of MEABR policy over fishers' self-governance.

The MEABR experience

Since the implementation of the first official MEABR in 1997, policy uptake has constantly increased throughout all regions of Chile. Of a total of 547 MEABRs (May 2005), 301 have fully-approved benthic resource management plans and are in full operation. The remaining 246 are not allowed to operate until they have their plans approved. The total area of sea floor comprising MEABRs is approximately 102 338 ha. Species that are included in MEABR management plans vary between fisher associations, however loco, key hole limpets and sea urchins are the most important, representing around 85, 70 and 30 percent of MEABR management plans respectively (Castilla, Gelcich and Defeo, 2007). Currently there are around fifty species included in MEABR management plans in Chile; these include algae, bivalves, echinoderms, gastropods, tunicates, cephalopods and crustaceans (Table 1).

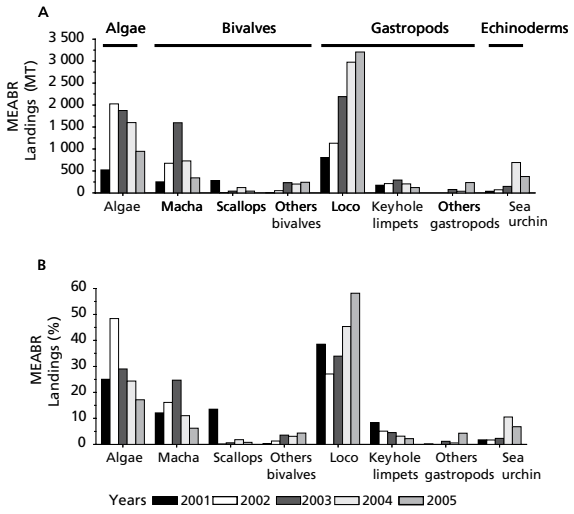
Loco has been the most important species to be harvested from MEABRs, accounting for around 30-60 percent of landings; however, algal species (mainly *Gracilaria*) have also played an important role (Figure 3). It is important to note that variability observed in landings of the beach clam macha (*Mesodesma donacinum),* and scallops (*Argopecten purpuratus*) from MEABRs may have been due to the highly variable nature of the stocks that appear to be affected by El Niño events (Stotz and González, 1997; Wolff and Mendo, 2000). Therefore, in making MEABRs that focus on

TABLE 1
Benthic species included in MEABR management plans along the Chilean coast

ALGAE	**GASTROPODS**
Luga negra (*Sarcothalia crispata*)	Loco (*Concholepas concholepas*)
Luga roja (*Gigartina skottsbergii*)	Lapa rosada (*Fissurella cumingi*)
Picuyo (*Odontocymbiola magallanica*)	Lapa negra (*Fissurella latimarginata*)
Huiro palo (*Lessonia trabeculata*)	Lapa bonete (*Fissurella costata*)
Huiro negro (*Lessonia nigrescens*)	Lapa picta (*Fissurella picta*)
Huiro flotador (*Macrocystis integrifolia*)	Lapa reina (*Fissurella maxima*)
Chasca (*Gelidium* sp)	Lapa (*Fissurella sp*)
Luga (*Mazzaella laminarioides*)	Lapa (*Fissurella nigra*)
Cochayuyo (*Durvillaea antartica*)	Lapa (*Fissurella pulchra*)
Chicorea de mar (*Chondracanthus chamissoi*)	Lapa (*Fissurella bridgessi*)
Pelillo (*Gracialaria chilensis*)	Locate (*Thais chocolata*)
	Caracol (*Argobuccinum sp*)
BIVALVES	Caracol palo palo (*Argobuccinun argus*)
Macha (*Mesodesma donacium*)	Caracol trophon (*Thophon* sp)
Ostion del norte (*Argopecten purpuratus*)	Caracol rubio (*Xanthochorus cassidiformis*)
Chorito (*Mytilus chilensis*)	Chocha (*Calyptrea trochyformis*)
Cholga (*Aulacomya ater*)	
Culengue (*Gari solida*)	**CEPHALOPODS**
Almeja (*Protothaca thaca*)	Pulpo (*Octupus mimus*)
Choro zapato (*Choromytilus chorus*)	Pulpo (*Enteroctopus megalocyathus*)
Almeja (*Venus antiqua*)	
Disco (*Semele solida*)	**CRUSTACEANS**
Navajuela (*Tagelus dombeii*)	Jaiba peluda (*Cancer setosus*)
Taca (*Mulinia* sp)	Jaiba mora (*Homalaspis plana*)
Taquilla (*Mulinia edulis*)	Jaiba reina (*Cancer coronatus*)
Ostion del Sur (*Chlamys vitrea*)	Picoroco (*Austromegabalanus psittacus*)
EQUINODERMS	**TUNICATES**
Erizo (*Loxechinus albus*)	Piure (*Pyura chilensis*)

Source: SERNAPESCA (2007).

FIGURE 3
Landings from MEABRs for years 2001–2005 in Chile



A represents total landings and B represents landings from MEABRs as a percentage of total annual MEABR harvests. Data for macha (*Mesodesma donacium*), loco (*Concholepas concholepas*), key-hole limpets (*Fissurella* spp.), sea urchin (*Loxechinus albus*) are shown.

these species, there can be shifts from great successes to failures (González *et al.*, 2006). Other gastropods (mainly *Thais chocolata*) have begun to be harvested during the last 3 years accounting for around 5 percent of total MEABR landings.

It is important to highlight that 100 percent of loco landings in Chile come from MEABRs. However, in the past five years only around 5 percent of key-hole limpet landings are from these areas. Sea urchin landings from MEABRs represent around 1 percent of national open access landings. Therefore, although key-hole limpets and sea urchins are present in MEABR management plans, their harvest from the MEABRs is secondary.

Self-governance and MEABRs

From 1997 to the present, Chilean small-scale fisher associations have gradually been adapting to their new lifestyles as non-migrating businessmen and as part of co-management regimes. In general, fisher associations have been able to follow policy requirements identifying areas of sea floor over which they wish to make a claim and pay for baseline studies from which resource TACs and management plans are established. Fishers are following MEABR regulations to the extent that they are beginning to pay an annual fee to government for the right to maintain the management area. This fee is fixed per hectare of seabed and as such is not related to catch or revenue; it is paid after the fourth harvest.

Fisher associations pay external consultants to undertake yearly follow up assessments of stock in the management area as required by the Law. Effectively, fishers' have taken control of their harvesting decisions regarding: (a) The amount of TAC to be gathered and the timing of this harvest, within the officially designated harvest season and approved TAC, (b) the price fishers will accept for their resources, (c) the number of buyers to whom fishers sell and (d), how income is distributed within the associated members (Gelcich, Edwards-Jones and Kaiser, 2007). Fishers have responded to the challenge of these new harvesting decisions that involve dealing with new responsibilities associated with management and commercialisation (Gelcich, Edwards-Jones and Kaiser, 2007). Fisher association leaders have also started to view the MEABRs as more than a marine tenure. Now they see them as a way towards organization that would facilitate fisheries and non-fisheries related business activities such as tourism and seafood restaurants. An important driving force for this was the fact that MEABR resource TACs are given to the association and not individually. This promotes the right incentives for cooperation instead of confrontation between fishers (Castilla, Gelcich and Defeo, 2007).

Fishers have attached important non-economic values to the existence and ownership of MEABRs, such as pride and accountability. As part of MEABR consolidation, innovative strategies that account for fishers' entrepreneurship include attempts to sell management area resources collectively between associations, for instance in the form of cooperatives, such as PACIFICOOP in central Chile or TERPESCAR in Carelmapu, Southern Chile. PACIFICOOP is a selling cooperative formed by 15 fishing associations of central Chile. They are trying to find new markets for benthic resources and are currently seeking a way to export live loco to Asian markets. This

will add value to the low prices that have been paid for their resources during the last three years (Castilla, Gelcich and Defeo, 2007). TERPESCAR is a private company formed by fishers from five fishing associations and represents around 700 artisanal fishers. This association has managed to administer the landing ports thus acquiring new responsibilities and incomes. In the year 2004 they sold 1 197 227 loco worth around $US2 000 000. They have also managed to contract the services of a general manager for the company and an accountant (World Bank, 2006). These initiatives, although so far unique in the country, show how the MEABR policy has opened new ways for fishers' long-term engagement as resource stewards and how it has encouraged self-empowerment and self-governance to solve fishery problems.

5. FISHERS CURRENT PROBLEMS WITH MEABRS

The problems associated with 'open-access' and the traditional 'command and control' approach to fisheries, led the search for MEABRs as a management alternative under which the responsibility for benthic resource sustainability is shared by those who have an interest in the fishery's success (government and fishers). The Chilean fisheries department has addressed the issues of government legislation to support legal rights as recommended by much of the co-management and common-property research literature (Ostrom, 1990; Pomeroy and Berkes, 1997). However, fisher associations have had to implement the MEABRs at local scales and have faced different problems. Small-scale artisanal fishers are not homogenous and do not share a common understanding of the problems that confront them (for studies on fishers perceptions of MEABRs see Gelcich *et al.* 2005a,b, Gelcich *et al.*, 2006; Castilla *et al.*, 2007; Gelcich *et al.*, in revision; World Bank, 2006).

Studies that have looked into the functioning and fishers perceptions regarding MEABR agree that it is essential to address enforcement problems in order for MEABRs to develop into successful enterprises and not just another of many development narratives. Granting user rights is not enough and a strong policy to stop encroachment is needed. In fact, within a questionnaire study published by the World Bank (2006), when small-scale artisanal fishers (N= 143) were asked about their main problem with MEABRs, 65 percent mentioned encroaching (theft) from other fishers. This study also highlighted that MEABRs have provided basic elements to increase collective action and generate new business and collaboration ideas. Further, Gelcich *et al.* (2005a,b) provide evidence that the speed of MEABR uptake has had an important effect over the abundance of "open-access" diving grounds, which are becoming increasingly scarce. This has important livelihood consequences for artisanal fishers. Table 2 presents factors that artisanal fishers identified as those important to address as well as the solutions they propose.

TABLE 2
Problems with MEABR policy identified by artisanal fishers and their suggested solutions

Factor to be addressed	Fishers' solution
Enforcement	- More support from the national fisheries service to oversee execution of MEABRs
	- Stronger sanctions for fishers caught steeling from MEABRs
	- Financial support to look after areas
Increase MEABR productivity	- Include more species in MEABR plans
	- Experiment with feeding locos in ponds (e.g., grow-out/ranching *in situ*)
	- Rescue *locos* from sand embankments
	- Experiment with re-populating sea urchins and other species
	- Adopt a multi-species/ecosystem approach
	- Feeding *loco* in mesh bags
	- Rescuing juvenile loco from harvested shells

Source: World Bank (2006), Gelcich unpublished data.

6. DISCUSSION

Over the past several decades, scholars have argued over governance strategies for management for commons and common-pool resources (CPRs). In fact, the theory of the commons has undergone major transformations, moving from the "tragedy of the commons" model, to dealing with small-scale, community-based systems as ways of promoting self-organization and self-governance (Ostrom, 1990; Berkes, 2006). Within the fisheries sector, the use of rights based management strategies to re-establish sustainability in open-access fisheries is becoming increasingly popular. The experience with TURFS in Chile, which was implemented as a way to avoid the collapse of the loco fishery, has been successful in terms of managing some benthic artisanal fisheries in a sustainable way and generating basic incentives for fishers' empowerment. However, if the policy is going to succeed in the future, scientists and practitioners must respond to important challenges. Most published studies on the human dimensions of MEABRs stress the need for fishers to have more liberty managing MEABRs as a way to adapt these to local realities and create incentives for developing institutions of self-governance (Castilla and Defeo, 2001; Meltzoff *et al.*, 2002; Castilla *et al.*, 2007; Gelcich *et al.*, 2005a,b, 2006, 2007; World Bank, 2006), i.e. to shift from the current co-management approach used in Chile (= collaborative co-management; Sen and Nielsen, 1996) towards an adaptive co-management approach. Folke *et al.* (2002), defined adaptive co-management as "the process by which institutional arrangements and ecological knowledge are revised in a dynamic, ongoing process of learning by doing".

Adaptive co-management combines the 'dynamic learning' characteristic of adaptive management (Holling, 2001) with the 'linkage' characteristic of cooperative management (Jentoft, 2000), and collaborative management (Olsson, Folke and Berkes, 2004). The adaptive co-management approach treats policies as hypotheses and management as experiments from which managers can learn (Gunderson, 2000). Most importantly, adaptive co-management theory implies that management practices should be adjusted by the monitoring of feedback signals of social-ecological change (Berkes, Colding and Folke, 2003). This shift towards adaptive co-management would imply the need for participatory research. Small-scale coastal artisanal fisheries with well-demarcated fishing grounds provide ideal situations for experimental management research (Castilla, 2000; Johannes, 2002; World Bank, 2006). In addition, if MEABRs are going to successfully adapt, managers should encourage local communities (associations) to experiment and continuously adapt to changes (social or ecological). These are factors we feel are an essential part of the so-called Ecosystem-Based Management Approach (FAO, 2003; Arkema, Abramson and Dewsbury, 2006; Christie *et al.*, 2007).

At present the MEABR policy has left few legal alternatives for community experiments and subsequent governance adaptations. This is unfortunate as participatory research in support of adaptive management is becoming almost commonplace in many developing countries (Edwards-Jones, 2001) under the premise that the participation of resource users and other stakeholders is important not only in the management of resources, but also in research orientated toward the generation of information and innovations that shape how resources are understood and exploited (Johnson *et al.*, 2004). In addition it forms a basic building block for self-governance of MEABR resources.

Coastal management beyond MEABRs

A new self-governance policy in Chile that attempts to grant user rights to first nation coastal communities is currently being discussed in the Chilean senate. This initiative originated in a bottom-up manner from first nation Lafquenche and Huiche cultures and has the support of the Undersecretary of Planning and the Undersecretary of Fisheries. Use-rights will be granted depending on the importance of specific coastal

areas for cultural manifestations (defined as "customary use" in the policy) and on the way the community attempts to manage the area. Cultural manifestations include fishery, religious, recreational and medicinal uses. Adolfo Millabur, a mayor of an important council in Chile and part of a Lafquenche community, highlights that the policy "is very important in order to legitimize coastal first nations communities rights to govern coastal areas". It is important to highlight that in theory the policy will grant autonomy to the first nation community to govern defined coastal areas. This includes autonomy for management and conflict resolution. In this way this policy will have the potential to generate the first self-governed coastal management practices in Chile (Ecoceanos, 2005).

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This FAO Fisheries Technical Paper documents 32 case studies and four syntheses (Canada, Japan, New Zealand and the United States of America) on the role of industry in the governance and management of fisheries. The studies are drawn from ongoing practice in Europe, North America, Japan and Australasia. The types of fisheries cover those for crustaceans, fish, molluscs and echinoderms. In general the scale of the fisheries tends to be small, which has been one of the reasons attributed to their success. In all but one case it is clear that well-defined fishery rights have contributed to the success of the programmes though the initiative for development and adoption of the programmes covers a range of institutional causes. The case studies are intended to inform and provide potential models that may be used in other fisheries.

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