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**Southern Ocean International Governance Model:**

**A perspective from fishery management**

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**Abstract (ca. 115 words):**

This article aim to discuss a possible effective governance paradigm through the discussion of the fishery management practice in southern ocean area. The first section provides the background of the fishery management system currently effective, including the basic profile of fishery resource, practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). Later section will analyze the interaction between the practical implementation of CCAMLR and the Antarctic Treaty System as well as with the rules of marine protected areas (MPAs), clarify which management rules should be referred as priority when comes to the jurisdiction conflict. The final section will try to construct a possible model for the southern ocean international governance.

## **Introduction:**

The Southern Ocean surrounds Antarctica and represents approximately 15 percent of the world's ocean area. It extends from the coast of the continent northwards to the Antarctic Polar Front, a physically and biologically distinct area. The position of the Antarctic Polar Front varies seasonally and geographically, but is generally located near 50°S in the Atlantic and Indian sectors of the Southern Ocean and 60°S in the Pacific sector.

Although, the Southern ocean could be regarded as an important part of Antarctic based on the Antarctic treaty system, it is also a unique area because the Antarctic treaty does not exclude the rights from other international conventions for high seas, which means the governance of this area, need to obey all the international legal procedure as well as coordinate the possible conflicts.

As most of the Ocean area around the world, fishing in Southern Ocean is a main commercial activity attracts most attentions. However the extreme sea and weather conditions, especially the special sea ecosystem make the fishery in this area has some certain differences from other part of the world. Therefore, the management of fishery in this area is one of the focal issues for the governance system on the Southern Ocean.

The Southern Ocean has a long history of marine resources harvesting including fishing that could back to 1790 when sealers first hunted fur seals for their pelts. By 1825, some populations of fur seal were hunted close to extinction, and sealers began hunting elephant seals and some species of penguins for their oil.

Whaling in this area began in 1904 and all seven species of whales found in the Southern Ocean were extensively exploited. Besides that, Antarctic finfish, crabs, squid and krill, a keystone component of the Antarctic ecosystem, have also been exploited at various levels since the early 1960s.

Although seal harvesting continued on a small scale into the 20th century, seal populations were reduced to the extent that most commercial harvesting was in decline by the mid-1820s. There has been no commercial sealing in Antarctica since the 1950s. A Convention for the Conservation of Antarctic Seals was established to avoid

d future over-exploitation of seal populations.<sup>1</sup>

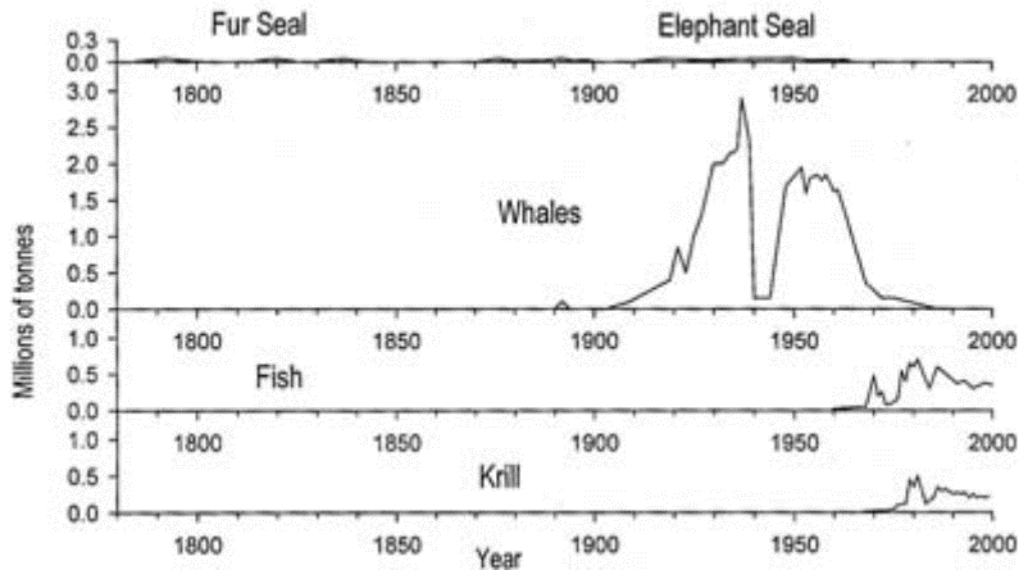


Fig. 1. Historical human harvesting in the CCAMLR Convention Area.

From management of southern ocean fisheries: global forces and future sustainability

Whale is also a kind of important Marine Resource in the southern Ocean. Of the major whale groups only the minke whale escaped severe depletion due to commercial fishing. Exploitation on this species (the smallest of the large whales) only began in the early 1970s. Although several hundred thousand Antarctic minke whales exist and the species is not considered to be endangered there was an appreciable decline in the estimated abundance of minke whale between 1982/83–1988/89 and 1991/92–2003/04. A moratorium on commercial whaling was introduced in 1987. Whale sanctuaries were established in the Indian Ocean in 1979 and Southern Ocean in 1994.

In Southern Ocean area, large-scale fishing for fin fish did not begin until the late 1960s, and important species included lanternfish (myctophids), mackerel icefish (*Champscephalus gunnari*), marbled rockcod (*Notothenia rossii*) and Patagonian rockcod (*Patagonotothen guntheri*). By the late 1970s, certain species of fin fish had been severely overfished.

<sup>1</sup> The Convention established permissible catch limits for species such as crabeater, leopard and Weddell seals. Annual catch limits were set at 175 000 individuals for crabeater seals, 12 000 individuals for leopard seals and 5 000 individuals for Weddell seals. A zoning system was established with closed hunting seasons. Total protection was given for the rare Ross seal and southern elephant seal and certain species of fur seal.

Extensive harvesting of fish in the sub-Antarctic during the late 1960s and mid-1970s, along with the emergence of interest in the large-scale exploitation of Antarctic krill, raised concerns about the sustainability of such fisheries, which may led to the overexploitation of stocks of marbled rockcod, and large the possibly ecosystem-related peaks in catches of mackerel icefish.

In order to prevent the potential threats to Antarctic marine ecosystems occurring as a result of increased commercial interest in Antarctic fisheries resources, including krill. the Antarctic Treaty Consultative Parties (ATCPs) negotiated a convention of Antarctic Marine Living Resources, to fulfill the target of marine resource conservation. Drawing on the advice of the Scientific Committee on Antarctic Research, the Antarctic Treaty Consultative Meeting (ATCM) convened the conference which resulted in the negotiation of the convention of Conservation of Antarctic Marine Living Resources (CAMLR). Therefore, CAMLR is usually be seen as a multilateral response Antarctic Treaty Consultative Parties (ATCPs) made to the resource challenge, which also indicate the external link between ATCM and ATCPs.

### **The Conservation of Antarctic Marine Living Resources (CAMLR) and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)**

The negotiation about a convention of marine living resource began in 1977 (Constable et al. 2000; Miller et al. 2004), when the contracting parties of the Antarctic Treaty, who had enjoyed considerable success in depoliticizing governance and promoting scientific collaboration in respect of the Antarctic Continent, made the effort about governance of the marine area, and primarily to prevent overexploitation of Antarctic krill, which widely perceived as the keystone species of Southern Ocean food webs.

CAMLR was signed in 1980 and take effect since 1982. The Convention area covers around 10 percent of the Earth's surface, is defined in the CAMLR Convention as the area south of the Antarctic Convergence. The Convention also applies in the area south of 60°S to which the 1959 Antarctic Treaty applies. (Figure 3)



with their physical environment (Article I(3)). And pays particular attention on Krill, since it is being seen as the core stone of the ecosystem in southern Ocean. The guiding principles of conservation include direct consideration of not only the species in question, but the survival of dependent and related populations (Article II(3)(b)). However, considered about the existing conventions, the marine resource referred in CAMLR doesn't include seals and whales. And CAMLR measures may be excluded from the territorial seas and exclusive economic zones (extending up to 200 nautical miles from the base line) belonging to states within the region (Declaration included in the Final Act). If we don't defined these as a negative part that weaken the power of the convention, and looking for the positive parts, these issues may also provide a chance for the Antarctic treaty system to working collabrately with other organizations and other countries, which lead the Antarctic governance more actively in the international governance system. (Karen Scott)

**It worth specific attention that science plays an extremely important role in such convention from the very beginning.** In 1975, at the Eighth Antarctic Treaty Consultative Meeting, the ATCPs adopted Recommendation VIII-10 which noted the need to promote and achieve within the framework of the Antarctic Treaty, the objectives of protection, scientific study and rational use of Antarctic marine living resources. The Recommendation focus on scientific study as an essential basis for protection and rational use of Antarctic marine living resources.

Further, ATCM Recommendation IX-2 (London, 1977) called on the Antarctic Treaty Parties to contribute to scientific research on Antarctic marine living resources, to observe interim guidelines on their conservation, and to hold a Special Antarctic Consultative Meeting to set up a definitive conservation regime for such resources.

The Scientific Committee on Antarctic Research (SCAR) was invited to give advice in respect of key scientific areas for research. And SCAR responded in form of the Biological Investigation of Marine Antarctic Systems and Stocks (BIOMASS) program in 1977. The BIOMASS emphasized the importance of krill as a keystone species in the Antarctic marine ecosystem and underscored concerns that unsustainable, large-scale exploitation of krill could have severe repercussions on Antarctic seabird, seal and whale species that depend on krill as food. This detection also partly leaded the final Marine resource protected direction of the convention of CAMLR.

Being responsible for the conservation of Antarctic marine ecosystems, CCAMLR practises an ecosystem-based management approach. This does not exclude harvesting as long as such harvesting is

carried out in a sustainable manner and takes account of the effects of fishing on other components of the ecosystem.

Actually, scientists had argued since the 1950s that ‘processes regulating fish stocks were much more complex than assumed in single-species models’ and that ecological ‘relationships could only be determined from quantitative empirical findings’ (Watt 1956). However, models needed for management on a multi-stock basis were too complex to be handled at that time. Until late 1970s, the scientific committee focused more on the marine resource research, took some programs and set certain databases, the model finally being settled and being reflected in the convention.

Based on the convention, a Commission was established for the Conservation of Antarctic Marine Living Resources (CCAMLR). The marine living resources being referred in the convention of CAMLR includes all species in the Convention area other than whales and seals for which there were existing Conventions. Adopting the **scientific advice**, CCAMLR is primarily concerned with krill and its dependent predators, and fin fisheries.

The Commission includes a Scientific Committee established by the CAMLR Convention, and have two subsidiary bodies: a Standing Committee on Implementation and Compliance, and a Standing Committee on Administration and Finance to fulfill its duties. The Commission and the Scientific Committee can establish subsidiary bodies that are necessary for the performance of their functions. The **Commission** adopted terms of reference for a Standing Committee on Implementation and Compliance (SCIC) to provide it with information, advice and recommendations on fishery monitoring and compliance related matters. Meeting at least once every year, SCIC reviews and assesses the implementation of, and compliance with, CCAMLR's conservation measures.

SCIC also reviews information on illegal, unreported and unregulated (IUU) fishing, the operation of the System of Inspection and works with the Scientific Committee and the CCAMLR Scheme of International Scientific Observation (SISO) to make recommendations on improvements and priorities.

As an international commission, CCAMLR has 25 Members, and a further 11 countries **have acceded to the Convention**. CCAMLR practices an ecosystem-based management approach. This does not exclude harvesting as long as such harvesting is carried out in a sustainable manner and takes

account of the effects of fishing on other components of the ecosystem. Meanwhile, **the Commission agrees a set of conservation measures that determine the use of marine living resources in the Antarctic based on the best available scientific information,.**

### **The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) with South Ocean Governance System**

Besides the convention of the Conservation of Antarctic Marine Living Resources (CAMLRL), there are also certain conventions effected in the southern ocean area, including the International Convention for the Regulation of Whaling (ICRW, in force since 1948), the Antarctic Treaty (ATS, in force since 1959), and the Convention for the Conservation of Antarctic Seals (CCAS, in force since 1978) as well as other legislations of high seas.

All these legislations founded the basic governance system of the Southern Ocean area, and also can be seen as an important part of the Antarctic governance system.

Take the International Convention for the Regulation of Whaling (ICRW) to compare with the convention of Conservation of Antarctic Marine Living Resources (CAMLRL) as an example, we can find that in contrast to the Conservation of Antarctic Marine Living Resources (CAMLRL), the International Convention for the Regulation of Whaling (ICRW) is not part of the ATS and there is in fact little cooperation between the two regimes. Nevertheless, given the historic examination and until now, managing the whaling activities in the Southern Ocean the ICRW plays an important role in the management of Southern Ocean marine resources.

If refer to the commissions working in the southern ocean area, we can get further evidence that the south ocean area is actually under the multiple management of different commissions. For example, management of whales in the Antarctic (and elsewhere) is the responsibility of the International Whaling Commission and they are evaluating the recovery of whale stocks and the effectiveness of the moratorium and sanctuaries. There are indications that some species of whale are recovering, but the low abundance of some of the largest species has made total numbers difficult to estimate from sightings data.

Along with the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), these commissions also take important part in the southern Ocean governance system,



and the multiple existence of these commissions also reflect the conflicts possibility and the plight the ATS may face to in the future.

Unlike other commissions and governance instruments in Southern Ocean area, CCAMLR plays an especially important role in the Southern Ocean governance system. It is not only because it takes the management of fishery through scientific and ecosystem-based method, but also because it set a creative model for marine resource management as well as for the Antarctic governance system from three particular aspects.

First, as we mentioned previously, CCAMLR has strong link with the Antarctic Treaty Consultative Meeting (ATCM) and the Antarctic Treaty System (ATS). From the very beginning, the CAMLR Convention can be seen as a multilateral response by Antarctic Treaty Consultative Parties (ATCPs) to the potential threats to Antarctic marine ecosystems at the very beginning. As an important part of the Antarctic Treaty System, the CAMLR Convention make up the defect that the Antarctic Treaty hold for the Marine resource governance, and as the executive organization for the Southern Ocean fishery management, CCAMLR also take the important responsibility in Antarctic governance system working under and along with ATCM.

Secondly, as part of the Antarctica governance system, CCAMLR set a good example for operational and effective management of Marine resource, and may also offer the reference for the future development of Antarctic treaty system. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) is a permanent institutions established by international convention CAMLR in 1982 with the objective of conserving Antarctic marine life. It is the first Antarctic instrument to do so, and has more organizational tendency compared with the Antarctic Treaty system itself from the legal perspective. The commission hold annual meeting and still take the method that to pass a proposal needs the agreement of all parties. Although it seems less efficient, this decision making process actually protect the right of all consultative parties, and maintain the stable of the commission organization at some stage.

Unlike other part of the world, the Antarctic is a special place, which includes land, ocean, and the ice sheet, also rich biological resources, mineral resources and water (as ice). So when we talking about the governance of Antarctic, we are actually talking about a governance system that may far more complicated than we usually expected. Apparently, the consultative parties notice this and

from this aspect, the CCAMLR can be seen as a step effort the ATCM made to find an efficient way for Antarctic Ocean area governance.

Decades past since the enforcement of CAMLR, and we can see that the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) itself is running smoothly, and even take some of the responsibility of ATCM. Such as the Marine Protection Area proposal, and the inspection rights fulfill.

If we further examine the relationship between CCAMLR and ATCM, we may find that some of the responsibilities such as the relationship between Antarctic Specially Protected Areas (ASPA) and Marine Protected Areas in Southern Ocean (MPA) actually has certain connection, and have not being divided clearly based on previous documents. In a whole related treaty system, this situation is actually has bad effect to the whole system, and may weaken the authority of ATCM. However, during the past a few years, at the ATCM and CEP annual conference, the discussion about these issues has been proposed and no actual resolution has been found, this partly because this kind of work need a lot of extra efforts, but on the other hand we can see the positive part that the CCAMLR actually plays a good role in executive certain responsibilities, that lead the consultative parties doesn't see any urgent necessarily of change.

The third notable feature of CCAMLR is that it adopted an ecosystem approach. Working closely with the scientific committee, the CCAMLR created the ecosystem-based management of marine resource in 1980s. Since the CAMLR Convention came into force it established the Scientific Committee (SC-CAMLR) and all Members of the Commission became the Members of the Scientific Committee. The Scientific Committee provides the best available scientific information on harvesting levels and other management issues to the Commission. In turn, the Commission is obligated by the Convention to take full account of the recommendations and advice of the Scientific Committee in making its decisions.

The Scientific Committee takes into account the outcomes of research from national programs of CCAMLR Members. In addition CCAMLR also established a number of programs to collect the data required for the effective management of the Southern Ocean, including fisheries monitoring, the scientific observers on fishing vessels, and ecosystem monitoring and marine debris programs.

The Scientific Committee meets annually immediately prior to the Commission meeting. In order to address the wide range of science areas that might impact on the decisions of the Commission, the Scientific Committee has established a number of working groups that meet during the year and assist in formulating scientific advice on key areas.(CCAMLR,2014)

“It was science which changed Antarctic politics and provided the ground-work for the Antarctic Treaty and the Antarctic regime.”(Lorraine M.Elliott, International Environmental Politics-Protecting the Antarctic)Considering about the founding and operation of CCAMLR, we can see the true meaning of what science plays in the governance role.

Based on the scientific committee’s advice, and considered about the fragile nature of the Antarctic ecosystem, concerns were expressed for the survival species, such as krill. From this stage the Convention of CAMLR was be regarded as a pre-emptive treaty. And finally formed the ecosystem based management system.

However, as a sword has two sides, we can clearly see the benefits from this fundamental policy, that the marine resource protection can start from the very beginning. On the other hand, the CCAMLR may also need to afford the critical from other parties and even the involved parties for overprotection of the marine resource regardless of other parties’ rights. Furthermore, the issue could extend to the very beginning of the convention itself, where is the authority of marine resource protection in Southern Ocean area come from? Who has the rights to authorize the marine resource management?

### **The Challenge for CCAMLR**

As we mentioned previously, although CCAMLR can be seen as a good model for Antarctic governance, certain challenge still exist.

The first one is the CCAMLR conservation measures regulating fishing in these latter areas require legislation by the relevant member. Such members may also opt not to be bound by a particular conservation measure suggested by CCAMLR. However, they are, in theory, obliged to impose alternative measures at least as effective as the CCAMLR ones. Management decisions are taken by CCAMLR which is mandated to act on the ‘best scientific advice’. While the relevant members may hold different opinion.

The second one is the new method of technology caused new challenge for CCAMLR management. By the mid-1990s, CCAMLR had been able to establish conservation measures or at least make major progress with respect to the protection and rational use of fish stocks and the protection of stocks of dependent species, through: (i) its Ecosystem Monitoring Programme, (ii) the calculation of a precautionary catch limit for krill and Patagonian toothfish, (iii) a 100% observer scheme in long-line fisheries, and (iv) the regulation of the development of new and exploratory fisheries. (Karl-Hermann Kock, Keith Reid, John Croxall & Stephen Nicol, 2007) However, a variety of problems were either continuing or were newly recognized and addressed from the mid-1990s onwards. Illegal, unreported and unregulated (IUU) fishing, as well as the new and exploratory fisheries cause a lot of difficulties for CCAMLR to manage.

The main and the focal issue is about the authority source. This is actually the same problem the Antarctic Treaty hold as well.

### **Conclusion:**

CCAMLR is a good model for Antarctic governance, and the scientific based governance method is unique, it will exist for long and even can be use as reference for Antarctic governance.

Certain defects of CCAMLR as well as the Antarctic Treaty itself is actually from the same source. To solve the challenge the CCAMLR faced is actually related to the whole treaty system.

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