

Key Conditions for the Sustainability of Community-Based Fisheries Management on Unrestricted Fisheries: A Study of Self-Imposed Management in the Alfonsino Fishing Grounds off Katsuura, Chiba Prefecture, Japan

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Abstract

This paper aims to analyse and elucidate key conditions for the sustainability of community-based fisheries management (CBFM) on unrestricted fisheries in Japan. It re-examines more than 50 years' worth of empirical evidence regarding the outcomes of the socio-economic rationality of the self-imposed management of common property, with particular reference to splendid alfonsino (*Beryx splendens*) fishing grounds off Katsuura, Chiba Prefecture, and the Small-Type Coastal Fishing Vessel Fishery Cooperative (STCC) there. It shows that the exclusive use of fishing grounds and other factors, including communal solidarity and a social milieu advocating fishermen's protection of fishing grounds observed roughly 20 years ago, have for more than 50 years continuously existed as conditions necessary to establishing sustainable CBFM in unrestricted alfonsino fisheries using waters off Katsuura. At present, however, it should be recognised that the resource management of alfonsino as a migratory species would be required with different types of fishery operations in fishing grounds other than STCC's operation near Katsuura. To resolve this issue, a co-management system involving a resource management plan and fisheries risk management plan under the fraternal insurance of the fishery was recently introduced in collaboration with the Japanese government, Chiba's prefectural government, and the STCC. As a type of adaptive fisheries management system in Japan, this co-management system would play an important role in securing key sustainable conditions for CBFM in unrestricted, self-managing fisheries in alfonsino fishing grounds off Katsuura, Japan.

1. Introduction

This paper primarily seeks to analyse and elucidate key conditions for the sustainability of community-based fisheries management (CBFM) in unrestricted fisheries in Japan. It re-examines more than 50 years' worth of empirical evidence regarding the outcomes of the socio-economic rationality of self-imposed management of common property in reference to the vertical longline fisheries near splendid alfonsino (*Beryx splendens*) fishing grounds off Katsuura, mainly by the Alfonsino Division of the Chiba Prefecture Small-Type Coastal Fishing Vessel Fishery Cooperative (STCC). Though Kuronuma [1–4] investigated this case in the period up to the early 1990s, the alfonsino fisheries under STCC received no legal administrative support at that time. Furthermore, though recent research by Hamada [5] and Torii [6] has summarised alfonsino resource management

and its marketing issues in the Kanto region, including Katsuura, no research has focused on the self-imposed management of fishing grounds off Katsuura after administrative support with the resource management plan commenced in 2007, or the 2011 implementation of administrative safety net support for insurance for fishermen's income plan under an adaptive fisheries co-management system in cooperation with STCC and legal support from the prefectural and national governments. To rectify such oversight, Section 2 of this study presents an overview of alfonsino fisheries and their resources, after which Section 3 relates a brief history of the STCC and its self-management after 1990s. Section 4 then focuses on the content of self-imposed management in 2013 and its situation in respect to the fisheries. Lastly, Section 5 offers concluding remarks regarding necessary internal and external conditions, as well as identifies elements crucial to the sustainability of CBFM in managing common property alfonsino resources in fishing grounds off Katsuura.

2. Alfonsino Fisheries and Resources

The splendid alfonsino is a demersal fish species typically found at a depth of 300–1,500 m in seas with rocky bottoms. With a floating period of 150 to 300 days, some stock stays at the sea bottom, while other stock migrate across a wide range of the Pacific Ocean after several years of living at the sea bottom; their maturation begins at age 4, and their lifespan can exceed 26 years [7]. According to Kase [8], alfonsino concentrate at the sea bottom during daytime, yet move to sea mountains at night. The alfonsino spawning season lasts from June to October, in areas from Sotobou (near Chiba Prefecture) to Sagami Bay, the Izu Islands, Shikoku, Kyusyu, and even the Ogasawara (Bonin) Islands. In all, the species is distributed at the sea bottom of an extensive area ranging from the Pacific Ocean at the southern end of Aomori Prefecture and the Sea of Japan south of Niigata Prefecture to Australia and New Zealand [9]. DNA analysis results show that alfonsino caught in the area of the Emperor seamount chain were all splendid alfonsino (*Beryx splendens*). However, the detailed reproductive behaviour and migratory patterns of alfonsino remain largely unclarified [10]. Figure 1 shows the chief alfonsino fishing grounds of Japanese fisheries.

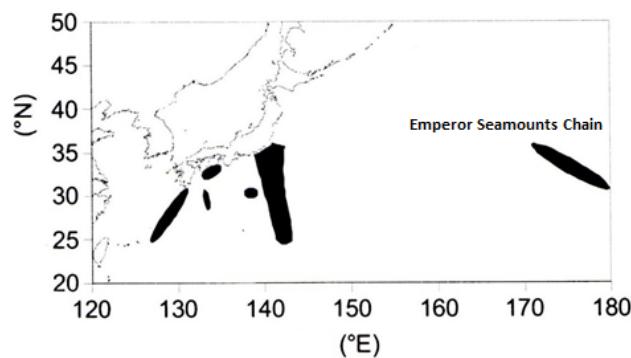


Figure 1 Main Alfonsino Fishing Grounds of Japanese Fisheries

Source: National Research Institute of Fisheries Science (2013-b) [11] p.5

More specifically, Figure 2 shows the chief alfonsino fishing grounds in Chiba Prefecture, including those off Katsuura, which as shown in Figure 2 comprises roughly 600 km² from latitude 35° 05" north of the Pacific side of Chiba Prefecture, to longitude 140° 20" east, latitude 35° 52" north, and longitude 140° 35". In another sense, it is about 10–26 km from Katsuura Lighthouse. A total of 16 groups of approximately 250 fleets of small-type, coastal alfonsino fisheries from Katsuura to Emi—a distance of about 40 km—currently use these fishing grounds. Kuronuma [4] pointed out that one reason why fishermen from Katsuura to Emi use the fishing ground off Katsuura, as shown in Figure 2, on a basis of self-imposed management is its geographical location, which is difficult for fishermen of other prefectures to access.

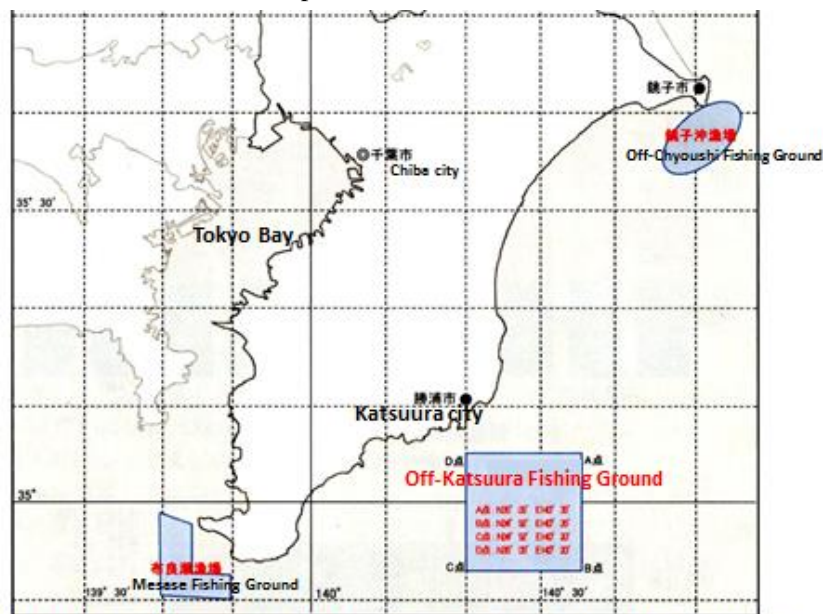


Figure2 Alfonsino Fishing Grounds, Chiba Prefecture

Source: Chiba prefecture (2014) [12] p.1

Figure 3 shows the total harvest of alfonsino in Chiba Prefecture, including the fishing ground off Katsuura, from 1969 to 2013. A rapid growth in catches can be observed from 1971 to the mid-1980s, after which a declining trend emerged that persisted until 1998, when off Katsuura, total catch was 268 tonnes. After this time, alfonsino resource conditions in Chiba's fishing grounds were at far higher levels until 2009, when another decline emerged in 2010. In 2013, nearly 60% of the total catch in Chiba occurred in fishing grounds off Katsuura.

In the 1992 season—during which the alfonsino season spanned from November to June—the landing value of the fishing ground stood at ¥0.9 billion, with a landing volume of 853 tonnes. By contrast, during the 2012 season—during which the alfonsino season spanned from October to June, a period introduced by the STCC in 1996—the landing value was ¥1.39 billion, with a landing volume of 892 tonnes. A reason for such constancy in tonnage can be clearly observed in the average price of alfonsino during the past 20 years, during which time the market price of alfonsino caught in fishing grounds off Katsuura increased from nearly ¥1,050/kg in 1992 to ¥1,880/kg in 2012.

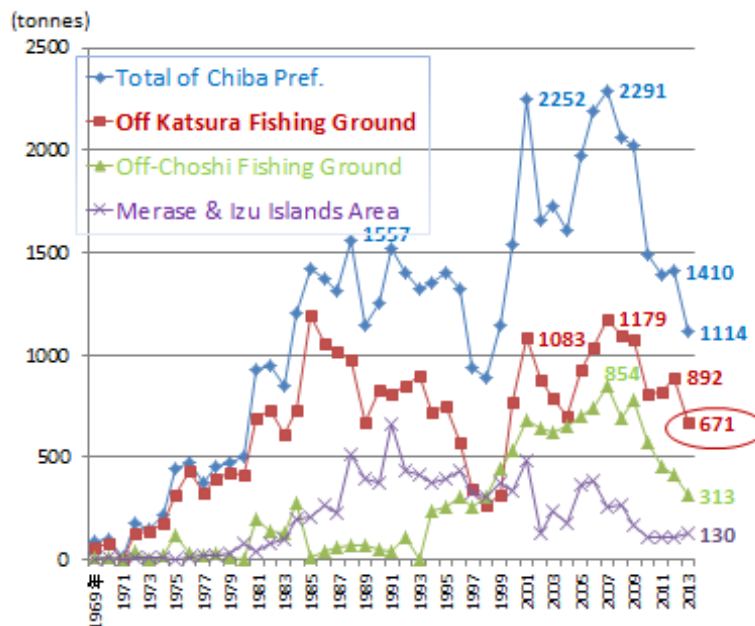


Figure 3 Catches of Alfonsino: Chiba Prefecture

Source: Chiba prefecture (2014) [12] p.86

According to Chiba Prefecture [12], from 1993 to 2012 STCC membership decreased from 609 to 380—that is, by roughly 40%—while the number of boats in fishing grounds off Katsuura during the same period dropped 17%—from 300 boats in 1993 to 249 boats in 2012 (survey and interview data from Kanetaka, 2014). As these trends clearly suggest, alfonsino fishing in fishing grounds off Katsuura among STCC members is highly important.

Alfonsino fishing vessels leave port at around 2:00 a.m. After roughly 90 min, they arrive at the fishing grounds off Katsuura. Casting begins at 4:00 a.m. and lasts until 6:00 a.m., though timing varies according to season. The latest operation hour occurs sometime between 8:00 a.m. and 10:00 a.m., in order to meet seasonal regulations allowing a maximum operation of four hours for each boat in each operation day. The vessels generally return to port between 10:00 a.m. and noon.

Tables 1 and 2 show operation patterns of small boat fisheries in the Sotobou region in the early 1990s and in 2014, respectively. Operation by any 1–10 tonne class fishing vessel—most of which are 4–5 tonnes—does not target alfonsino alone, but also various species according to the season, which can be observed in both tables. In the early 1990s, the combination of operations mostly consisted of vertical longline alfonsino fishing from November to June, squid angling from June to December, marlin longline fishing from January to March, skipjack trolling from March to May, and abalone diving fishing in some areas from May to September [4]. In 2014, despite a general similarity of combined operations, as shown in Table 2, some changes are clear, including the abandonment of squid angling due to the product's rapidly decreased market price. Alfonsino vertical line fishing season will start one month earlier in 2014 than in the early 1990s, since the

STCC set the alfonsino season to span from October to June in 1996. These changing situations indicate the increased importance of alfonsino fisheries for the fisheries business management of STCC members in Sotobou.

Main target Species	Fishing method	Entry ratio (%)	Operation patterns												Average	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Fishing days	gross revenue
Alfonsino	Vertical line	100	▼	▼	▼	▼	▼	▼					▼	▼	62	262
Squid	Angling	91						▼	▼	▼	▼	▼	▼	▼	57	204
Skipjack	Trolling line	84			▼	▼	▼								21	243
Marlin	Long line	17	▼	▼	▼										16	273
Mackerel	Angling	22												▼	9	18
Japanese bluefish	Vertical line	7					▼	▼	▼	▼	▼	▼			33	103
Abalone	Diving	22						▼	▼	▼	▼				25	168
Prawn	Gill net	26								▼	▼				14	44
Octopus	Octopus pot	7	▼	▼	▼	▼									20	159

Main target Species	Fishing method	Entry ratio (%)	Operation patterns												Average	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Fishing days	gross revenue (¥million)
Alfonsino	Vertical line	-	▼	▼	▼	▼	▼	▼				▼	▼	▼	-	-
Squid	Angling	-													-	-
Skipjack	Trolling line	-			▼	▼	▼					▼			-	-
Marlin	Long line	-	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	-	-
Mackerel	Angling	-	▼	▼	▼								▼	▼	-	-
Japanese bluefish	Vertical line	-													-	-
Abalone	Diving	-					▼	▼	▼	▼	▼				-	-
Prawn	Gill net	-								▼	▼	▼			-	-
Octopus	Octopus pot	-													-	-
			No Fishing Operation					Some Operation in early 1990s								
			▼ Fishing Operation					▼ No Operation in early 1990s								

Table 1 Source: Chiba Prefecture (1993) [13] p.12 Table 2 Source: random sample investigations by Kuronuma (2014)

Kuronuma [4] pointed out that, since alfonsino fisheries are line fisheries using vertical longlines, they are categorised as unrestricted fisheries that do not belong to fisheries with fishing rights in the context of Japanese fishery legislation—a circumstance that remains unchanged. Unrestricted fishery activities themselves are thus characterised by lacking any legal right, including in the case of alfonsino fisheries under STCC. It is generally considered that unrestricted fisheries tend to find themselves in weaker legal positions given the lack of support during conflicts with other legally backed fisheries, such as licensed fisheries and fishing-right fisheries, over a species or fishing ground. However, unrestricted fisheries nevertheless occur within a legal framework in which they are not identical to free fisheries in a strict sense of the word *free fisheries* in the context of the Japanese fisheries legal system [2–4]. In this context, the self-imposed management among alfonsino fisheries off Katsuura presents an extraordinary case of adaptive fishery management in Japan.

3. A Brief History of the STCC and Its Management After 1990s

Instances of administrative assistance with(out) legal support for alfoncino fisheries under the STCC can be observed since early 1990s. Registration approval was given to the STCC by Chiba's prefectural government in 1966, given the dispute concerning Tokegawajiri's mackerel fishing ground. In 1990, a policy for promoting Pacific middle block stock management by Chiba, Kanagawa, Shizuoka, and Tokyo commenced under the guidance of the Fisheries Agency of the Japanese government and in collaboration with JF-Zengyoren (National Federation of Fisheries Co-operative Associations). In 1995, the policy resulted in the Policy Plan of Extensive Migratory Stock Management in Chiba Prefecture (PEMSM) by Chiba Prefectural Fisheries Co-operative Association (CPFCA), including an alfoncino management plan, after which the Fishermen's Consultation Party of Chiba Prefectural Resources Management (FCPCP) was organised to support self-management by fishermen. The FCPCP is currently active and plays a central role in the adaptive management system of alfoncino resources and fisheries. Until these self-management policy movements in 1995, there were neither legal nor financial support from national and prefectural governments. As such, up to this point, alfoncino fisheries management can be characterised as having pure self-management by fishermen in order to improve their business by resource management.

In 2007, the Resource Recovery Plan (RRP) for alfoncino in the southern area of the Japanese Pacific was formulated by the Fisheries Agency of the Japanese government in collaboration with the governments of Tokyo Metropolitan and the prefectures of Chiba, Kanagawa, Shizuoka, and Kochi. The alfoncino division of the STCC under FCPCP plays a central role in the consultation of fishing grounds management for waters off Katsuura, Choshi, and Merae (Figure 2). A revised RRP and Insurance for Fishermen's Income Plan (IFIP) were introduced in 2011; the purpose of the revised RRP is to accomplish the urgent recovery of low stock level resources [11]. Under this RRP policy, fishermen retain self-imposed management, yet both national and prefectural governments are responsible for fishermen's self-management with both legal and financial support. These circumstances differ from those brought about by PEMS in 1995, as previously discussed. The safety net of IFIP works when fishermen cannot earn income similar to that of the previous year, by which they can receive up to 90% of the previous three years' average income within last five years, excluding the highest and lowest income years. In 2011, 83 members of Shin-Katsuura Fisheries Cooperatives initiated fisheries cooperative insurance, and 65 of the 83 members entered the IFIP, 37 of whom received insurance payment [12]. Though these fishermen must pay certain amount of insurance premium, they can avoid business risks when needing to manage alfoncino resources based on the revised RRP. Here, an adaptive fishery management system involving co-management among alfoncino fisheries can be clearly observed.

As for fishing grounds management, as noted by Kuronuma [4], the prefectural and national

governments do not directly give exclusive use rights to fishery groups, yet also does not prioritise agreements made between fishery groups that resulted from past conflicts. Also, fishing area regulations have been attached as collateral conditions for round haul net permits. This exclusive use is “exclusive use resulting from experience” [4] and thus not supported by law, which indicates that rights are not directly given for alfonso vertical line fishing. However, support is given in that self-management of the fishing grounds off Katsuura is prioritised and that other fisheries are regulated [4]. In this sense, fisheries other than those prohibited by law in permit conditions can freely enter the fishing grounds off Katsuura. However, other fisheries should consider that no entry to fishing grounds off Katsuura should be taken into account, given governmental recognition of high-grade self-imposed fishery management by the alfonso division of STCC [4]—a situation that has not changed much in past 20 years. In this case, the situation can also be considered part of adaptive management system.

4. The Content of Self-Imposed Management in 2013 and the Current Situation of the Fisheries

The Provision for Operations in Fishing Grounds off Katsuura (POKF), as revised on 25 September 2013, consists of 16 points: 12 items, plus a supplementary four items, as well as appendices for three items [12]. Generally, the POKF stipulates operation methods and other conditions in order to ensure the conservation of alfonso resources and to categorise the fishing grounds off Katsuura as sustainable production grounds, as Item 1 states. Item 2 states that, in 2013, the fishing season is set to start on 1 October 2013 and end on 30 June 2014, while Item 3 measures the position of fishing grounds off Katsuura to be about 600 km², as shown in Figure 2. Provisions regarding operations and operation methods in Items 4–7 are designed to respond to actual requirements, including the maximum fishing time of four hours thought to best meet the seasonal conditions and the limitation of fishing gear and methods. Item 8 stipulates the adjustment and allocation of harvests in the case of line entanglement based on year-long experiences, while Item 9 provides prohibitions of some fishing gear and non-fishing days—all Saturdays except the first and third Saturdays in December—as a measure to preserve the fishing ground and promote family services. Penalties listed in Item 10 include one operation day off by all members of the fishing vessels group of the region if any member violates any items of the provisions. Supplementary measures include the prohibition of operations during the closed season (1 July to 30 September) in the continental shelf area of fishing grounds off Katsuura; the restricted access of recreational fishing boats to the fishing grounds off Katsuura; and the corresponding Ootakane fishing ground provision of 2003. As an appendix, it includes a measure to protect age-1 juvenile fish less than 200 g and 25 cm. In 1994, these standards were less than 180 g and 18 cm [4].

As of September 2013, the provision of alfonso fishing grounds off Katsuura have been

improved, with 32 revisions over a span of more than 45 years since documentation began in 1969. It has functionally succeeded in protecting the fishing grounds off Katsuura by excluding other fisheries and fishing methods and due to fishermen's efforts toward self-imposed management. As background to the initial condition, it should be noted that the settlement of competition and disputes with mackerel purse-seine and line fisheries were external conditions that induced the protection of the fishing ground [4].

Fishing days in fishing grounds off Katsuura increased from 105 days/year in 1992 to 164 days/year in 2012 [12]. In 1992, these fishing days constituted 44% of the alfonso fishing season at the time, which rose to roughly 60% in the 2012 season. These shifts also indicate the importance of alfonso fishing for business. Catch per unit of effort (CPUE), on the other hand, decreased from 41 kg/day per boat in 1992 to 29 kg/day per boat in 2012, to produce a 20-year average of CPUE of 36 kg/day per boat [12]. This decrease may indicate a decreased stock level of alfonso, suggesting the need to manage this migratory stock with the cooperation of related fishermen and governments.

5. Concluding Remarks

This paper has sought to identify conditions crucial for the sustainability of CBFM in unrestricted fisheries in Japan. It has re-examined more than 50 years' worth of empirical evidence about the outcomes of socioeconomic rationality in the self-imposed management of common property of alfonso fishing grounds off Katsuura by the STCC. Its observations show that the exclusive use of fishing grounds and other factors, such as a communal solidarity and social milieu dedicated to protecting the fishing grounds among fishermen during the past 20 years [3], have continuously been necessary conditions for sustainable CBFM in unrestricted fisheries of alfonso fishing grounds off Katsuura for over 50 years. Observations also reveal that adjustments of fishery operations and other matters have also been necessary, based on the establishment of an organisation of fishing ground users [3,4].

During observations made during the past 20 years, including those of reduced alfonso stock in 2013, we have noticed that the resource management of alfonso as a migratory species could have been required by different types of fishery operations in fishing grounds other than those off Katsuura. In response, a co-management system was recently introduced with the cooperation of the Japanese government, the Chiba prefectural government, and the STCC that includes a resource management plan and fisheries risk management plan under the fraternal insurance of the fishery. This so-called co-management system, as one type of adaptive Japanese fishery management system, could be significant for key sustainable conditions for CBFM of unrestricted fisheries with self-imposed management in the alfonso fishing grounds off Katsuura, Japan.

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