

Original article

# Fish less, earn more: an experience of Japanese cooperation in Senegal

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## Introduction

In the Republic of Senegal, the growth of artisanal fisheries, accounting for 90% of the country's fisheries production (447,961 tons in 2012), has highlighted the need for fisheries management [1]. The problems faced by the artisanal fisheries include: (i) the depletion of demersal fish resources due to the increased fishing capacity, (ii) insufficient manpower of the public body to monitor fishing activities, and (iii) the absence of an alternative livelihood to fisheries. A reasonable way to solve these problems is to provide technical assistance to small-scale artisanal fishers to actively conduct fisheries management and access to new markets [2].

The fisheries characteristics in Senegal and Japan are similar in that: (i) artisanal fisheries are the main sub-sectors of fisheries and there are many types of fishing, (ii) there is a long stretch of coastline with many fishing villages, (iii) fishery products caught are diverse, including cephalopods and crustaceans in addition to fishes, (iv) fishery products constitute an important source of protein for people, (v) the distribution channels of fishery products are complex, and (vi) there is a strong stand from fishing communities, making the enforcement of fisheries management based on a law difficult. These characteristics are recognized as conditions for the introduction of fisheries co-management by fishers and administration. The fishers should play the principal role in fisheries management and that the administration, a supporting role. The voluntary participation of fishers is crucial because: (i) regardless of age and geographical locations, fishers are resistant to dictates by the authorities, especially when told not to fish, but abide by rules which they have decided for themselves, (ii) it makes sense to use the experience and knowledge of fishers in fisheries management, and (iii) the participatory approach to fisheries management is more advantageous than the centralized approach in terms of labor cost and thus, appropriate for Senegal experiencing severe financial difficulties [3].

To make the stable income of fishers, it is imperative to promote the fisheries co-management under the slogan of “Fish Less, Earn More” [4]. Fishes

of Senegal are somewhat poor in quality because of the improper handling after they are caught. This causes a loss of value or reputation of Senegalese fisheries products in international markets. In order to add value to fisheries products and maintain, or even increase, revenue of fishers, when managing artisanal fisheries, Senegal has been receiving technical support from Japan in the past 14 years.

This paper presents the results of the Japanese technical cooperation during the period 2003-2017 in Senegal.

## Materials and methods

As target resource, octopus (*Octopus vulgaris*) was selected for several reasons: (i) despite a high market value as an export product, Senegalese octopus are seldom exported to Japan but destined for the European market because of the poor quality, (ii) the catch had been decreasing with the size becoming smaller, (iii) as the lifecycle of octopus is as short as 12-24 months [5], there is a good chance for positive effects of fisheries management to be observed early, (iv) Japanese experience of the management of octopus fishing could be referred to, and (v) there are many things about octopus that Senegal can learn from Morocco and Mauritania.

We adopted the concept that the income from fishing activities should remain the same as before or even increase despite a smaller catch by means of raising the prices of octopus through the improvement of their quality.

The most challenging situation was the lack of price difference between good and bad quality octopus. To change the traditional way of pricing, add value to octopus, and diversify its export market, we conducted technical demonstration with the fisheries administration and the fishing company. One of the methods used was comparing the octopus caught by pot fishing and handled carefully using ice and plastic bags with the traditionally-handled octopus. We then asked fish dealers to set prices for the different quality of octopus in front of fishers. The good quality of octopus was immediately transported to the fish processing

plant, removed all the internal organs without using water and frozen prior to export to Japan.

## Results and discussion

The results can be divided into two: fisheries co-management and value addition of octopus.

### *Fisheries co-management*

It was decided that the introduction of a closed season and the use of octopus pots for spawning would be the components of the management of octopus line fishing. The closed season for octopus had previously been attempted by the government several times but had failed. It therefore left the decision on the period of the closed season to the fishing community. While there was an opinion favoring a closed season lasting for two or three months, it was decided to start it with one month in view of the capacity of fishers. Octopus pots for spawning are considered effective to increase octopus resources and are also used in Japan. To establish scientific proof of the timing of the spawning of octopus, the Oceanographic Research Center of Dakar-Thiaroye and fishers jointly conducted participatory research over a period of one year. This research found that September-October is peak spawning months based on the sexual maturity of octopus, supporting the belief of fishers. To motivate fishers to participate in fisheries management, local administration enacted a prefectural ordinance on closed season for octopus fishing. After obtaining positive results in a single fishing village, the management of octopus fishing was extended to other neighboring villages, and eventually to the regional and national levels. The closed season has been properly observed every year as almost 100% of fishers follow the rule of not catching octopus during the season. It has also been verified that many octopus enter the pots for spawning.

The experience obtained in Senegal illustrates that: (i) while various fisheries management methods, ranging from top-down methods to bottom-up methods, have been tried, positive results have only been achieved at those villages where the community has taken the initiative, and (ii) when fisheries management receives the support of the administration and a research organization instead of leaving everything to the community, the willingness of fishers to participate gains momentum. There is an increasing interest in fisheries co-management among Senegalese fishers and administration throughout the country.

Currently, the issue is that the management of octopus fishing is still lenient when compared to Morocco and Mauritania applying a closed season of four to five months. The sustainability of octopus fisheries management depends on economic benefit which is why it is necessary to promote adoption of value addition of octopus to improve their reputation

and prices.

### *Value addition of octopus*

Firstly, a research on the needs of the Japanese market for octopus products was conducted. Demand for octopus in the Japanese market is high quality, low price, stable supply and small size. Secondly, the quality of octopus was improved on fishing boats, at beaches and at processing plants. Thirdly, octopus samples were exported to Japan to participate in the Japan International Seafood & Technology EXPO. That time a questionnaire survey of buyers (importer, wholesale, retailer) was conducted. Senegalese octopus received a high reputation as having comparative quality to Moroccan and Mauritanian octopus. Fourthly, negotiations were undertaken to urge Senegalese and Japanese companies to make different prices between good and bad quality octopus. At the same time, a request was made not to buy octopus smaller than 350 g because it is prohibited in Senegal. Fifthly, the technical demonstration was conducted in Senegal to find out if it is possible to increase prices on good quality octopus. The studies showed that there was a noticeable difference between the two octopuses in terms of quality as well as in prices offered by the Senegalese company.

**Table 1.** Price difference between good and bad quality octopus

Size of octopus	Good quality octopus	Bad quality octopus
Over 2kg	N/A	N/A
1kg to 2kg	5,000 CFA Franc	4,500 CFA Franc
500g to 1kg	4,000 CFA Franc	3,000 CFA Franc
Under 500g	3,000 CFA Franc	2,000 CFA Franc

1,000 CFA Franc = 1.74844 USD. 2017-07-15.

It was therefore assumed that fishers will be able to earn more by improving the quality of octopus. Diversifying export markets is an important strategy since Senegalese economy depends heavily on fishing industry.

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