



Octopus Fishery Management Initiatives: A Promising Approach for Managing Coastal Fisheries

Octopus as “entry point”

Fished on all coasts of the Western Indian Ocean region, octopus - *Octopus cyanea* - is a source of income for numerous coastal communities. As it occurs in lagoons, octopus is generally fished on foot at low tide, although in numerous locations, the increasing scarcity of the resource has driven fishers to dive over the submarine wall. Formerly considered as a low-value product that only fisher households consume, octopus from South West Indian Ocean is now widely marketed. Nowadays, the region exports over 3,000MT of octopus per year, the largest part of which is provided by Tanzania and Madagascar. The octopuses are mainly intended for the European Union market, particularly Portugal, Italy, and France.

Octopus is characterized by a relatively short life cycle (average of 18 months), as well as an exponential growth pattern under which it doubles weight every two months. A mature female will lay eggs in its den and usually die one month after they hatch. Once hatched, juveniles lead a planktonic life for two months, before returning to the lagoon to colonize it. The biology of this animal is of special interest to fisheries management as octopus seems to have potential to respond very rapidly to any biological recovery action aimed at promoting the growth phase or recruitment of stock.

The first experiences in octopus fishery management were conducted in Madagascar. Nearly 15 years ago, the villages of Southwestern Madagascar initiated voluntary closures with the help of Blue Ventures, a British NGO. At about the same time, the Government enacted a period of biological recovery of one month and a half. Although the support provided by IOC at the time (ReCoMaP programme) exclusively addressed scientific

aspects, the organisation was already preparing to play a role in regional exchanges.

These experiences and the fishery's potential to generate tangible results in a short period of time convinced IOC's SmartFish Project to use it as the “entry point” to encouraging a full set of fishery management reforms. Since the beginning of the programme in 2011, the fishery has become a select laboratory among the “pilot” initiatives conducted by SmartFish - a project whose aim is to provide a practical and suitable framework for promoting better governance of coastal fisheries.

In Rodrigues, the promotion of an annual two-month closure across the full littoral has allowed for halting the decline of the fishery and setting up an original collaborative surveillance mechanism in collaboration with the authorities and communities. In Mauritius, the results of a voluntary closure conducted in seven coastal villages convinced the Government to implement a national-scale biological recovery, restoring the dialogue between the administration and fishers and triggering positive developments in the governance of coastal fisheries. In Zanzibar, the establishment of no fishing zones in several villages allowed for making local joint management arrangements operational by granting local fishers' committees the possibility of deciding their own regulations.

Rodrigues: the closure mechanism achieves maturity

In Rodrigues, octopus fishing is a traditional economic activity that has become oriented on supply neighbouring Mauritius over the last decades. The elements that led the regional

government to enact an “octopus closed season” in 2012 are explained in another document (Smart Sheet #12). However, it is important to remind that the severe decline of the fishery led the authorities to take action, given the importance of this activity for the island’s economy.

After the first temporary closure of the octopus fishery, it was noted that the CPUEs, total landings, and economic returns of the fishery on the island had increased. Deemed a success by local fishers and decision-makers, the closure was repeated in 2013 and 2014, with continued support from the SmartFish programme. Since 2015, the Rodrigues Regional Assembly (RRA) has been able to self-fund the annual closure. During its first year, the collaborative effort between the regional government, local authorities (fishers’ villages), main exporters, and partners (NGOs and donors) was formalized within a Steering Committee and the mechanism was able to gradually improve some of its components to optimize its overall operation and increase its impact.

Although the first closure was enough to convince most fishers, full buyout of the communities was achieved only after the second one yielded its results. The consultations subsequently held with fishers highlighted the need to improve the surveillance mechanism to address the limited effectiveness of public services. Therefore, as soon as 2013, proposition was made to dot the coast with fifty posts kept by the fishers themselves. This system allowed for increasing the physical presence of field surveillance but failed to sufficiently involve communities, resulting in significant poaching. Since 2014, this system has been replaced with a more effective community surveillance plan that promotes villagers’ participation.

The first three closures had clear, short-term effects on the fishery. At the reopening following the first closure, the average weight of male and female octopuses had doubled (meaning female ones were able to reach sexual maturity) and CPUEs had increased threefold, which translated into a significant increase in the annual volume as compared to the previous year (from 383T to 508T). Similar results were noted on the second year, although catches at reopening were not as consequential as hoped. The third closure yielded extremely good results, especially in terms of the female average weight that amounted to double of the weight at first maturity.

Political will was a decisive factor considering how unpopular the action was with some communities at the beginning of the process. The biggest success of the “Octopus Closed Seasons” is that it convinced both fishers and administration of the possibility of instituting sustainable management of this fishery and at the same time, deriving large benefits from it. Political authorities also showed tremendous courage in reforming the fisheries surveillance service in a social context where regulation enforcement remains a challenge.

This project also promoted the creation of an environment where coastal communities have the possibility of taking part in the management of the resources they depend on, in spite of an institutional framework that – as a reminder - still precludes joint management. It also allowed for launching into an institutional learning process where the different stakeholders work together at identifying new solutions, especially with outlooks to regulating access to the fishery. As such, this new collaboration will enable Rodrigues to build its own management model for octopus fishery, as well as for the other fisheries that the island depends on.

Mauritius: in the footsteps of its little sister

Test phase in the Southwest

Drawing on the results of the experience in Rodrigues, the fishery authorities of Mauritius requested IOC’s support to assess the feasibility of a similar temporary closure. Considering the big differences between the context of Rodrigues and that of Mauritius with respect to the socioeconomic importance of the fishery, governance, and geographic scale, the SmartFish programme proposed a voluntary “test” closure in the Southwestern region of the island.

The idea was to focus efforts on a “pilot area” deemed highly

productive (approximately a quarter of octopus landings, according to national statistics) and relatively isolated (limited risk of poaching by outsiders), to maximize chances of success. More importantly, this project also aimed to assess people’s perception of the fishery’s state and collaborate with villagers interested in becoming models for the rest of the country. As such, the project organized a series of meetings between the fishers and the administration at the central and local level.

Like in Rodrigues, a steering group was set up at the level of the Ministry of Fisheries to monitor field work and provide all relevant partners with guidance. A local NGO (MMCS) was tasked to organize consultations in the villages and form CRO groups (Community Resource Observers). CROs played a key role in organizing periodic sensitization sessions and fishing surveillance activities. Actual closure ran from mid-August to mid-October 2015, like in Rodrigues. Although the pilot phase did not have any legal basis, the project received the support of FPS (Fisheries Protection Service) workers in the form of increased presence on field and stricter implementation of existing regulations (prohibition of underwater fishing and minimum size) that are generally largely bypassed.

When the fishing season was reopened, it was noted that average size had clearly increased and some of the individuals caught reached a size that had remained unobserved for years. The data collected through participatory monitoring of the fishery showed that the average weight of the octopuses had doubled (from approximately 400g before the closure to approximately 1Kg at reopening) and fishers reported perceptible increase in catch till the month of January.

In all villages, fishers concluded that the experience was well worth renewing but that this time, the process should involve an official closure backed with appropriate regulations and better control, and should consider informal fisher-related issues. The project consequently demonstrated that a practical case could reactivate discussions between the fishers’ communities and the administration, allowing for identifying and addressing more general fishery governance issues linked to the access to the resources and enforcement of the law.

Towards a national-scale closure

The very next year, the government expressed unprecedented political will for national-scale temporary closure. The management of a national-scale closure in Mauritius was likely not to be easy as the multitude of informal marketing circuits encouraged poaching. Indeed, unlike Rodrigues, Mauritius does not export octopus and most of the time, the landed catches are consumed by fishers’ households or directly sold to caterers and tourist establishments. This was topped by the lack of means of FPS and the “legacy” of a certain leniency towards offenders, which significantly weaken the coastal fisheries control function.

These difficulties are exacerbated by the free access to the fishery and the fact that octopus is further targeted by “amateur” rather than “professional” fishers (who, theoretically, are expected to report their catches). According to the estimations of the Ministry of Fisheries, their number is tenfold higher than that of license-holding fishers.

To address this, the sensitization efforts rolled out by the administration and partners targeted not only coastal communities but also the larger public, with some messages targeted directly at consumers, as well as the numerous caterers and hotel trade operators of the island to dissuade consumption during the closure period. With respect to this, the role of the SmartFish programme was to coordinate the efforts of a group of NGOs well-established in different regions of the island (MMCS, Eco-Sud, Lagon Bleu, Eco Mode Society, Reef Conservation) with cofunding from the “Small Grants Programme” (UNDP-GEF).

In 2016, the government issued a regulation for the first national-scale closure of the octopus fishery. Coastal communities and law enforcement agencies were mobilized to participate in control efforts, especially by facilitating communication between the public and the surveillance posts scattered around the island. Furthermore, the government refused to grant “compensations” to fishers - an act of bravery in a context where



the provision of welfare has led some communities to rely on it. However, the mechanism had a major weakness in that the regulations prohibited exclusively the catch of octopus - not its possession or marketing - making sanctioning extremely difficult.

Still, the data collected by the authorities indicate substantial increase in average size at national scale, i.e. from 668g (catches made over the 4 months prior to closure) to 1,553g (catches made over the first week following reopening). The catches reported by some fishers from different official landing sites of the island are also extremely encouraging as individuals of extremely rare size were fished over the first (6Kg) and second (9Kg) week.

Although massive sensitization has most certainly been successful in securing the population’s buyout of the need to implement a biological recovery period, compliance with this first national-scale closure was not optimal. An enduring demand on informal markets and the multitude of “amateur” fishers who often felt the closure did not apply to them, essentially prevented the halting of poaching. As such, this first attempt triggered a public debate on the access to the octopus fishery and other coastal fisheries in general. It also drove the government to forego the systematic granting of compensations, which certainly is a big step forward. It also triggered reflection on existing regulations: the prohibition of underwater fishing especially sparked off intense discussions in the northern part of the island where fishers perceive it as irrelevant, given the local conditions (no reef flat accessible on foot at low tide). By using octopus fishery as entry point for the action, the Government launched into a process that will enable it to identify ways of improving the management of coastal fisheries in consultation with users of the resource.

Zanzibar: promoting collaborative management

In Zanzibar, as in many places of the region, the increasing fishing pressure on coastal areas and little means allocated to management have made it necessary to distribute roles and responsibilities among resource users and public services. To

address this need, Zanzibar equipped itself with a regulatory framework favourable to the setting up of “co-management”, especially in MCAs (*Marine Conservation Areas*) which are the areas identified as most sensitive. As such, it was only natural that the octopus fishery, which is extremely important to the national economy, was selected to try these collaborative management principles out.

The *Kisiwa Panza*, within the PECCA (*Pemba Channel Conservation Area*) marine area, whose remoteness was expected to protect the project from *outsider* poaching was selected as test site. The community of *Kisiwa Panza* additionally showed sound social structure and was mainly comprised of fishers for whom octopus was a crucial source of income. Approximately 250T of octopus are annually landed in Pemba and 70% of it is shipped out of Zanzibar, mainly to supply exporters based in Tanga and Mombasa. However, the drastic decrease of average size of the fished individuals suggested that the stock was being overfished.

The *Mwambao* NGO was selected to implement the project, given its experience and the fact that it was already involved in an SFC (*Sheha Fishers Committees*) capacity building project. As such, the preliminary work conducted in *Kisiwa Panza* in early 2015 included consultation sessions with the local SFC, sensitization of the population of the two villages of the island (and neighbouring villages to introduce the initiative to them), and one participatory “mapping” of resources.

Regarding the overall governance of the project, a steering group was set up to enable national and local authorities and all stakeholders to take part in a process that was new to them. The group was comprised of representatives of the *Sheha* (administrative division) of *Kisiwa Panza*, local elected officials (district), representatives of the Ministry of Fisheries, traders (buyers from landing sites and main exporter), SFC members, as well as project partners.

The *Kisiwa Panza* SFC received support in selecting the fishing zone to be closed and deciding closure dates. To formalize the decision, a local regulation (*bylaw*) was drafted and validated by the authorities - the first local act governing fishing ever developed in Zanzibar. SFC prepared a participatory surveillance plan and the zone, called “*Ngazi*” was actually closed to

fishing for three months, between March and June. The idea of reopening the fishery at the beginning of the month of Ramadan allowed for a potential extension of the closure period as going underwater was not allowed during the sacred month. During Ramadan, women were the only ones authorized to fish on foot at low tide, ensuring a source of income to households during this good time. The committee's will to consider the economic needs of the community instead of limiting itself to bio-ecological considerations is worth noting.

The reopening of the fishery was a major event for the community of *Kisiwa Panza* and during the first two "bamvuas" (neap tides) the number of landings doubled as compared to the pre-closure "bamvua". A production peak was also noted at the end of Ramadan, coinciding with the resumption of underwater fishing.

Happy with the results, the community of *Kisiwa Panza* continued monitoring the fishery and the pilot project was concurrently extended to the neighbouring village of *Kukuu* with which it shares some fishing grounds. After two years of pilot project, these two communities had completed seven voluntary closures in three different sites. Furthermore, the SFC of the *Kukuu* village adopted a different closure model where the designated area is permanently closed and reopened for just short periods (and a limited number of fishers) spaced by a few months. Although average sizes remain low, an increase was noted and individuals of exceptional size (9Kg) were caught.

After securing the Government's buyout and new fundings, decision was made to expand the initiative to three other MCAs, including *Unguja*. The principles of co-management will be introduced in new communities, drawing on the experience built during the test phase and promoting exchanges of good practices between villages.

« Learning by doing »

Each of the three models presented had its own implementation and scope. The idea, when using the octopus fishery as "entry point" was not to set a unique model but actually use its "reactive" potential to initiate a "learning by doing" process, to trigger reflection and, ultimately, reforms of the local governance system of coastal fisheries.

There is no doubt that the involvement of fishers, whether through national consultation or a co-management approach at villager level, is the decisive factor of success of this type of initiatives. The weakness of control means in the region forces the legislator to secure resource user buyout to minimize risks and promote voluntary enforcement of regulations.

These projects oriented on the octopus fishery also offered a formidable tool for identifying bottlenecks that an ex-situ study can only catch glimpse of, as they allowed for confronting individual ambitions with field and institutional realities. As such, they largely contributed to demonstrating the rationale for the "pilot projects" developed by SmartFish (cf. Smart Sheets #27 and 28) in support of reform efforts and feeding of institutional work with practical experiences.

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