Control of Foreign Fisheries
Policy Brief: Kenya

How can Kenya capitalise on the control of foreign fishing to maximise revenue and ensure a sustainable tuna fishery?

1. Background

The offshore tuna fishery in the Western Indian Ocean is dominated by purse seine and longliner vessels that target three main species of tropical tunas: skipjack, yellowfin and bigeye. These species are each assumed to be from a single stock[1]. These stocks are also classified as highly migratory. These two features have important implications for national and regional fisheries management. The first is that stock assessment is an ocean-wide issue and as such it is carried out primarily through the activities of the Indian Ocean Tuna Commission (IOTC) and its Working Parties[2]. The second is that the tuna fishery, at least for purse seiners, is both seasonal and highly variable.

The level of fishing by the purse seine and longline fleets inside the EEZs of coastal East African states is unclear, even for those states with bilateral agreements with the fishing nations. Historically the reporting of data from these fisheries to coastal states has been poor. Indeed, the nature of these agreements may influence the reporting of the fishing nations with the financial compensation agreed under the agreement being dependent on the catch reported from the EEZ. Although not strictly divided into EEZ and high seas areas, an indication of the tuna catch within Tanzanian EEZ can be derived from data submitted to the IOTC (Figure 1).
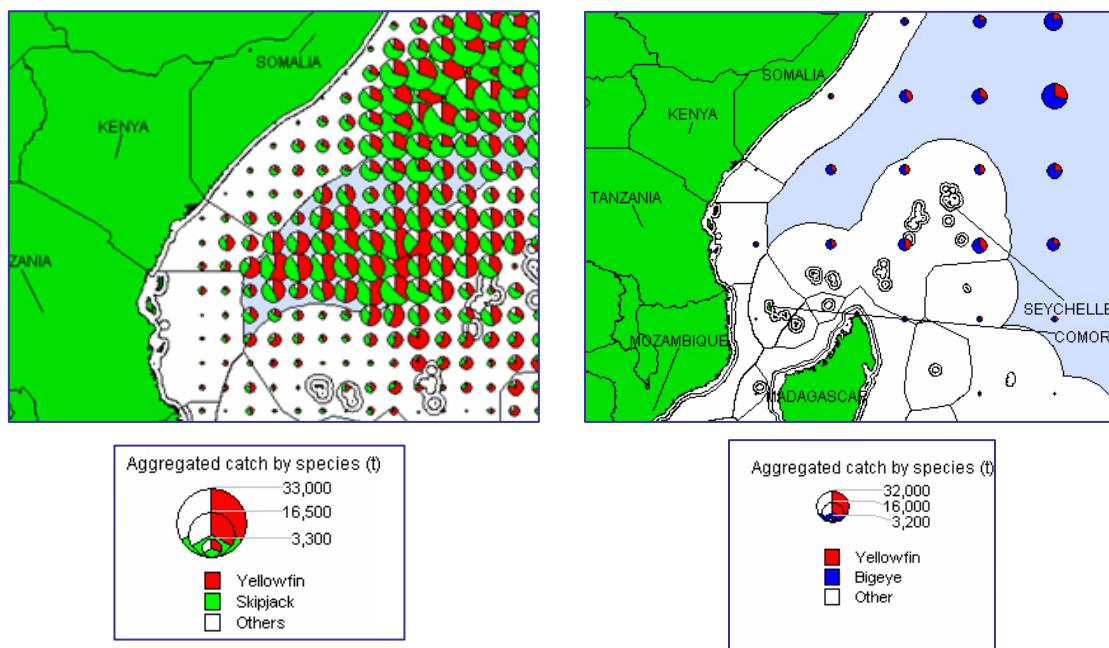

Figure 1. Aggregate catch of major tuna species in the western Indian Ocean from (left) purse seine (1° rectangles) and (right) longline (5° rectangles) fleets 1983-2001.

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[1] That is, the available genetic and morphometric data have failed to demonstrate the presence of more than one stock of each of these species in the Indian Ocean.
[2] This is essentially true also for the important bycatch species. This means that any limits on the catch of tunas, required for example in the event that they are thought to be over-exploited, are also likely to be discussed and agreed in this context. There would be little point in imposing catch limits in one part of the Indian Ocean if there were none imposed elsewhere, because this would provide little or no benefit to the stock as a whole.

A regional project entitled the Control of Foreign Fishing (CFF), funded by the UK Department of International Development (DFID) under their Fisheries Management Science Programme (FMSP), has been working with the Department of Fisheries in Tanzania to increase local capacity and awareness of economic models to maximise benefits from controlling foreign fishing activity within the EEZ. The key findings of this work, recommendations and general lessons learned from previous case studies are summarised in this brief.

There are two types of analysis that make up the CFF methodology. The first relates to the estimation of catch per unit effort both inside and outside a coastal state's EEZ to explore the potential benefits to foreign fishers of fishing within the EEZ compared to fishing elsewhere. The second involves an estimation of the probability of detection of vessels fishing without a licence arising from different surveillance operations and the penalty that illegal fishers expect to suffer. In both cases, it is important to tailor the analysis to the particular fisheries and surveillance characteristics of the region or country.

For the Kenyan study, catch and effort data are available from two sources. The first is IOTC database, which covers the area both inside and outside the EEZ up to and including 2004. These data are aggregated at the scale of 1° rectangles. The second is from the Kenyan Authorities, although little or no information is currently available in electronic form.

IOTC data for purse seiners show that catch rates in the Kenyan EEZ vary substantially from year to year and month to month. When fishing, these vessels need to maintain a critical level of catch per day (approximately 20 tonnes) to operate profitably. When the catch falls below this, they will search other areas for better fishing conditions. In some years, it appears that the distribution of the migrating tuna is such that fishing outside the Kenyan EEZ is sufficiently good that vessels do not to venture into the zone, or if they do, then they do not find favourable conditions there and therefore do not remain. However, each year there is the possibility that in order to be economically viable, vessels will wish to enter the EEZ to fish.

2. General Lessons Learned

Reviews of strategies for controlling foreign fishing have also been conducted for the tuna fisheries of Seychelles and the British Indian Ocean Territory using the CFF methodology (See Box 1 & Box 2). These reviews offered recommendations to the relevant management institutions on the optimal license level, fines for illegal fishing and the required surveillance effort in order to maximise net revenues from the fishery both in the short term through license and fee revenue, but also in the long-term through a sustainable fishery. These and other studies have provided the following recommendations and general lessons learned for licensing foreign fishing:

- **Each case study emphasized the importance of imposing large fines for illegal fishing activities.**

  Available funds to support surveillance activities to the coastal state are often limited. If there were significant potential benefits for foreign fishing within the coastal state's EEZ, then it is reasonable for the coastal state to set relatively high licence fees. This is only possible, however, provided the expected fine faced by the fishers for fishing illegally considerably exceeds the license fee. If the amount of surveillance that can be afforded is strictly limited, this can only be assured by imposing very high penalties, potentially including the forfeiture of the catch and vessel.

Box 1: Case Study conducted for the Seychelles Offshore Tuna Fishery

The offshore tuna fishery in the Seychelles EEZ is almost exclusively targeted by foreign vessels. The fishery is administered by the Seychelles Fishing Authority (SFA) which maintains a database on all fishing activity within the EEZ, provides licenses to purse seine and long-line fleets, and conducts surveillance by offshore patrol vessel and reconnaissance flights. The CFF model was used to develop advice on optimal license fees and fines for illegal fishing. Recommendations were provided for the different fishing fleets including the European purse seiners and Japanese and Korean longliners. In addition to revenue from license fees the study also needed to take into account both additional revenue generated from Port duties and transhipment costs, and the additional advantage for vessels entering the EEZ of access to the transhipment, landing and processing facilities at the port of Victoria on Mahé.

- **Although high values of maximum net revenue can be obtained from fine proceeds alone, this could lead to unpredictable and unsustainable levels of revenue and put the status of the resource as risk of over-exploitation.**

  While it is important to set penalties as high as possible, the proceeds from fines should not be regarded as a long term source of revenue in the same way as proceeds from licence fee are. Access to a fishery is limited, when necessary, for the purpose of achieving conservation targets, not so that revenue can be generated from catching vessels fishing illegally. By basing revenue expectations on the opportunity to impose fines without addressing the central problem of illegal vessels catching too many fish, the stock comes under increased pressure and risk from overfishing. The management aim should therefore be to strongly deter any unlicensed fishing. Only if this is successful, thereby effectively eliminating revenues from fines, will there be a long term sustainable fishery from which licence revenue can be generated sustainably.

- **Estimates need to be made of the probabilities of detection and successful arrest of unlicensed fishing vessels arising from different levels of surveillance activities; the perceived and actual probability of detecting illegal vessels can be very different.**

  One case study showed that even though the actual level of surveillance was constant over a 3 year period, it was only following a near record fine imposed on one vessel caught fishing illegally that license applications increased markedly in the third year. Clearly this arose because the perceived risk of being detected and fined rose to a level at which the expected fine exceeded the cost of obtaining a licence, even though the actual risk had not changed at all.

- **Following a high profile surveillance operation, it is important that the perceived increase in the probability of detection is maintained.**

  This can be achieved, for example, by increasing the number of patrols throughout the year to enhance the appearance of surveillance, thereby maintaining or increasing the perception of the probability of detection. Depending on how the extra surveillance effort is applied, this may also elevate the actual probability of detection. A degree of targeting can be used to increase the chance of detection during surveillance patrols by making use of reports from other sources that illegal fishing activities are occurring (e.g. overflights, or on-board observers).

- **Increasing the efficiency of surveillance can substantially reduce the cost as a proportion of the licence revenue.**

  When the maximum fine is reduced, surveillance can be increased to compensate by increasing the probability of detection and thereby maintaining the level of expected penalty. However, under these circumstances, the cost of surveillance can approach the total revenue from licence fees, hence net revenue may be reduced to zero. Where the deterrence of illegal fishing is the primary management issue, affordable surveillance is therefore vital. If the maximum fine must be reduced, and the cost of surveillance must be kept constant, to maintain the perceived level of expected penalty, the efficiency of surveillance must be improved.

- **Very high fines may be impossible to collect in practice.**

  Vessel owners may chose instead to forfeit the vessel, particularly when vessel value is low. The value of the vessel may be the best estimate of the maximum possible fine.

- **Licence fees of 10% of the catch value are rare fisheries for migratory tuna.**

- **It is better to calculate licence fees as a proportion of the marginal benefit arising from fishing inside the EEZ, rather than as a proportion of the catch taken inside the EEZ.**

  This is because the value to the fishers of obtaining a license arises from the difference between the catches that can be taken inside and those taken outside, rather than just the amount of catch taken from the EEZ. Results from the case studies showed that strong inter-annual variability could occur from the expected benefits of fishing inside the zone. In calculating appropriate levels of license fee, average estimated benefits were mainly used, but this meant that in some years the cost of a license was greater than the expected benefits. If this were to occur several years in a row, foreign fishers may become reluctant to renew their licences. Under these circumstances, it might be necessary to develop innovative solutions to the problem.

- **Additional benefits can be generated from alternative sources of revenue.**

  The results of the model currently assume only two sources of revenue; from the sale of licence fees and fines generated from successfully prosecuting illegal vessels. There are however, a number of other benefits that can be generated from foreign fishing activities such as transhipment fees and port facilities offering goods and services, for example.

Box 2: Case Study conducted for the British Indian Ocean Territory (BIOT)

The offshore tuna fishery in the BIOT waters is principally for skipjack and yellowfin tuna which spend part of their annual migratory cycle in and around BIOT waters. The 200 nautical mile fisheries conservation and management zone was assigned in 1991 and since this time licenses have been allocated, surveillance activities conducted and fines levied on illegal operations. Licence applications have varied from year to year. Use of the CFF model helped to understand the licensing patterns depending on the perceived value of the catch in any one year, the perceived threat of detection and the fees imposed for illegal fishing. It also provided recommendations on setting the license fee for both good and bad years (in terms of catch) and the level of surveillance required to deter fishermen from the alternative of fishing without a license.

3. Policy Recommendations

Issues of data quality

- While the data on the purse seine fishery in the Kenyan EEZ are better than those for the longline fishery, both are still relatively poor. The Kenyan Authorities have very few data themselves and the subdivision of the IOTC catch and effort data by area is fraught with uncertainty.
- Under the terms and conditions of licensing, catches by licensed vessels should be recorded weekly but no format for these reports has been specified and no data are submitted to Kenya on a routine basis. This lack of data has clearly been a significant impediment to Kenya when trying to undertake analyses of the value of fishing and the optimal level of licence fee, such as that attempted here.
- There is scepticism within Kenya as to whether the available data accurately reflect the true extent of fishing inside the EEZ. There are anecdotal accounts which suggest that unlicensed vessels may fish inside the Kenyan EEZ, possibly reporting positions to IOTC that are outside the Zone, or that licensed vessels may simply not report their catch data. Due to the lack of surveillance of the Kenyan EEZ, there is essentially no independent corroboration of the available catch and effort data.
- Due to restrictions in the quantity and quality of available data, the results generated from the model should be viewed with some caution. For example, to complete a comprehensive analysis, further data is required to link the cost of surveillance with the actual probability of detection.

Fee levels for purse seiners in Kenyan waters

- Overall, based on the available data, it would seem that the incentive for the purse seine fleet to fish inside the Kenyan EEZ at a seasonal licence fee of $20,000 is marginal. However, as indicated previously, it is the opportunity to fish inside the zone that the fishers are purchasing rather than a specific amount of catch. This fee level has proved to be acceptable over a long period of time and, so long as the fishing remains good in the region as a whole, it seems likely that the demand for access will remain.
- It would clearly be of value to the Kenyan Authorities, however, to achieve better compliance with the data reporting provisions set out in the terms and conditions of licensing and to obtain first hand information on the actual level of effort by purse seiners in the EEZ. The resulting data might then help to undertake an assessment of the value of the fishery with greater confidence than is currently possible.
- In the short-term, any potential increase to the total state revenue from foreign fishing activity is more likely to occur from increased compliance and the number of licences sold, rather than a direct increase in licence fee.
- Although increases to the cost of an annual licence fee may not be considered in the short-term, the duration of the licensed period might be important. The current value of the licence fee reflects the opportunity to fish throughout the year, although fishing activities usually occur over a finite 2-3 month season. Restructuring licence fees and developing licensing strategies would require a separate study altogether. However, the value of the licence should be maintained, particularly if the licensed period is reduced from 12 months to the period when peak catches are known to occur.
- Over the medium to long-term, additional information on the fishery should take priority to provide more precise data on the variability and value of the resources taken within the EEZ, from both licensed and illegal vessels. For example, additional surveillance is required to check the veracity of catch reports and make sure there are no unreported incursions at the edge of the zone. There may be more vessels interested in licences once they realise that there is a good chance that entry into the Kenyan EEZ will be detected.