

**Co-Management of Artisanal Fisheries in Mozambique: A case Study of
Kwirikwidge Fishing Centre, Angoche District, Nampula Province**

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ACHRONYMS

ADMAR	Maritime Administration
CAP	Fishery Administration Cimmission
CL	Local Committee
DNP	National Directorate for Fisheries
IDPPE	Institute for Development of Small Scale Fisheries
ICLARM	International Center for Living aquatic Resource Management
IFM	Institute for Fisheries Management
IIP	Institute of Fishery Reseach
MAP	Minister of Agriculture and Fisheries
RPM	Maritime Fishing Regulation
DAPN	Provincial Departament for Fishery Administration in Nampula

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1. Introduction

Mozambique is situated on the east coast of Africa between 10°27'S and 26°52'S latitude and has a coastline of 2,780 Km, which can be divided into three regions: The Northern region (characterised by the occurrence of corals and rocks); the Central region (sandy) and the Southern region (composed of dunes). Partly, this division determines the distribution and the potential of the marine ecosystems, their access and also influence the choice of fishing methods and equipment.

In Mozambique, fishing is a highly ranked activity not only for the absorption of the local labour force but also for the provision of aquatic protein products to the local populations and earning hard currency for the country. The main marine resources are crustaceans (mainly prawn, lobster and crab), pelagic and demersal fish, shellfish and marine algae / seaweed, presently cultivated in Cabo Delgado province.

During the last 15-20 years, prawn fishing / fishery is considered as one of the most important national revenue generators, accounting approximately to 40% of the total exports of Mozambique. Artesanal fishing is an important sub-sector in the socio-economic life of the country due to the social stability it provides amongst the coastal communities. As a matter of fact, over 500 thousand people in this country depend on artesanal fishing activities, of which 100 thousand are direct producers.

However, problems regarded to the knowledge of the behaviour of the resources accessible to this fishery still persist. There are few scientific (and consistent) studies about artesanal coastal resources which results in the scarcity of data on the potentialities and sustainability of the resources accessible to this fishing sub-sector. The few data available points the need for the introduction of urgent protection measures and rational utilization of national resources.

The fisheries Master Plan approved by the Mozambican government in 1994 sets the priorities and strategies for development to be pursued in subsequent years. With regard to the management of small-scale fisheries, the Master Plan lays emphasis on the involvement of fishermen in setting and enforcing the management regimes.

Thus, pilot measures for the sensitization of the users begun three years ago in Nampula province, district of Angoche, in the fishermen village of Kwirikwidge, where the IDPPE Angoche delegation had stated to run an artisanal project.

1.1. Study Objectives and Methodology

The present study is a continuation of a research begun in 1996 in the Kwirikwidge area and its main objective is to evaluate the present stage of the implementation and the expectations of the co-management of fishing resources in that area. The study was carried out using two types of sources: written and oral.

The written sources included various documents considered important for the theoretical background of the study. These included sectorial reports, fishing legislation, Maritime Fishing Regulation, master Plan, various monographies about Angoche district. The consultations were carried out in Maputo and Angoche.

The oral sources consisted of semi-structured surveys (attached) which involved interviewing fishermen, Maritime Administration Officers and other authorities including some local Non-governmental Organizations. A total of 40 fishermen, including owners (members and non-members) of the Kwirikwidge co-management committee, seamen and traders were interviewed. In addition, a seminar with the view to evaluating the co-management activities under way in that part of the country was organized. This enabled us to collect valuable data for our study.

The survey was structured in such a way as to enable a qualitative evaluation of the attributes (socio-economic, cultural and institutional) related with the co-management program in this area and which have been identified in the previous study.

The type of information collected and analysed in this study include demography, access and ownership of the resources, current structure of economical activities, level of participation in decision making and the attitude of community members in relation to collective action and the co-management program.

2. Characteristics of the Area under Study

2.1. Geographic Location and Number of Fishermen

Kwirikwidge is a fishing centre situated in Morua village in Angoche district (Nampula Province), 25 Kms away from the district's capital. Angoche district is situated between 15° 58' S 17° 01' S latitude (Roteiro da costa da República Popular de Moçambique, 1986), covering an area of about 3,500 Km² (Enciclopédia, Edt. Verbo 1945) and has a fishing population of about 12 thousand people (IDPPE, 1996).

The study area has about 700 fishermen, of which 100 are owners of fishing nets (mainly beach sein fishing nets) and fishing boats. The remainder are those who do not own fishing nets and constitute the local working class.

The Kwirikwidge fishing centre, with a coastal extension of 15 Kms, has limits to the North with "praia das pedras" (rocky beach), Sangage village, to the South with Natancala village, to the west with the continental village of Morua, to which administratively Kwirikwidge belongs, and to the East the open sea, where the population practises its main economic activity, fishing.

2.2. Physical and Biological Attributes

Along the Kwirikwidge coast there is a hill range whose altitude gradually increases from 90 to 120 metres. The hills are covered with vegetation which becomes more rhombus/rala??? near Sangage bay. By and large, the coast is generally low lying and arboreous in some parts.

Further North, the coast is edged by sandy beaches and further down it is pinnacled and edged with rocks.

For an extension of 10 metres from the coast towards the open sea, there are numerous corals, rocks and reefs but the South of Kwirikwidge has a sandy/argillaceous seabed, appropriate for trail fishing. The average depth accessible for artesanal fishing in this area is 20m, whereas the average wave height in the same fishery is a minimum of 2 metres and a maximum of 4 metres (Roteiro da costa da R.P.M, 1986).

The resources accessible for artesanal fishing in Kwirikwidge are demersals, big swallow and deep water pelagics (mainly, germon and saw-fish), small pelagics (for example sardine, anchoves, helsea kelee, horse mackerel, fish silver) deep sea cephalopods and crustaceans.

2.2.1. Climate

Like in the rest of the country, the climate in the area of study, humid tropical and temperatures vary between 17°-24°C minimum and 27°-33°C maximum. Throughout the year, mainly along the coast, there are calm winds in the mornings but rarely in the afternoons. By and large, the wind blows from the south, with a 15-30 Km/h speed from March to September and in a north-south direction during the remaining period of the year. In general, the rainy season is between December to March (Balói & Premigi, 1997).

2.2.2. The Fisheries

According to IDPPE census carried out in 1998, beach sein represents over 70% of the total of fishing methods used in artesanal fishing in Angoche. Normally, the beach sein fishing nets are operated between 100 to 250 metres and, in some cases, over 650 metres from the beach. The wings for these nets have a 24 to 48mm meshing.

During our study in Kwirikwidge, there were about 90 beach sein nets, of which 73 were fitted with a mosquito net cod end. We noticed that the use of beach sein nets with mosquito net cod end was a common practice which results in the catching of great quantities of spawns and small fish.

These nets are cast from small boats, locally known as “almadias”, with a capacity for 7 to 10 people. When the catch is particularly big more than 10-12 people join in to help trail the net ashore in exchange of a small percentage of the product. During the peak period these nets can be cast 3 to 4 times per day.

Very few gill nets are used in Kwirikwidge. These account for 15% of the total nets used in Angoche. They have a maximum length of 200m and are cast in deep water for 2-3 hours from small boats. No use of hand line fishing was recorded in this area.

2.2.3. Species Caught

The composition of the species caught in the area of study varies according to the weather conditions and the migratory characteristics of the resource. The main resources caught are fish belonging to the *Engraulidae* family (predominantly between the months of March to July), Clupeidae (which occur mainly in January, August, September and December), Sillaginidae and prawn from Penaeidae family (whose peak months are April, May, June and October). In addition, a great quantity of small unidentified species, which is believed to be anchovy, is also caught (Cf. Baloi & Premigi, 1997).

According to Balói and Premigi's study, the main species caught that belong to the Engraulidae family are *Thryssa vitirostris* and *Thryssa baelama*. The predominant species from Clupeidae family are *Sardinella albella* and a *Hilsa Kellee*. Two main species, *Upeneus vitattus* and *Upeneus sulphureus*, that belong to the Mullidae family occur in this area whereas only one species, *Sillago sihama*, was identified as belonging to the Sillaginidae family (Ibidi, 1997).

No statistical data about the percentage of catches per species area available for the Kwirikwidge, but qualitative data collected during our field study supported by the already mentioned Balói and Premigi reports, it appears that *Thryssa baelama* is the principal fishing resource caught, followed by *Sardinella albella*, *Upeneus taenoppterus* and *Peneus indicus* prawn.

3. Market

The criterion used in the previous study for this component consisted in the analysis of four main variables: the level of commercialization, the demand, consumer preference and the value of the product. Although there is a certain evolution in some of the indicators previously presented, this is not very substantial mainly due to the embryonic nature of the co-management system in the area. The section below focuses only on the fundamental aspects which, in general, influence this process.

3.1. Level of Commercialization and Demand

In the Kwirikwidge area fishing has still a commercial nature although it also plays a role of capital importance in the local subsistence. At least 99% of the people interviewed reported that from the total daily catch only 5% was for consumption. However, as mentioned in the previous study, the level of commercialization and the demand for fish vary according to various factors, among which the season of the year.

In the rainy season, there is, on the one hand, a substantial increase in the catches, and on the other hand, a relative reduction of traders due to the conditions of the access routes¹ In some areas, Quelelene island for instance, the increase of the catches in the rainy season leads to the deterioration of

¹ Although the road from Angoche to Kwirikwidge has been rehabilitated, the problem persists with the road that connects Angoche to Nampula city and other areas that consume fish from the Angoche/Moma area.

considerable quantities of fish due to the lack of traders. Such situation was not reported in Kwirikwidge.

In this season, despite the increase of catches there are always traders from Angoche looking for fish. According to the fishermen, some times it is difficult to guarantee a constant supply of fish in this area, as the demand created by the traders exceeds the local production capacity. This enables the fishermen to set the price for their product, unlike in other areas where the traders are, most of the time, the ones that take pricing decisions. In Kwirikwidge, it was reported that in case a trader does not agree with the set price, he can bargain.

Normally and depending on the demand, the traders buy fresh fish and sell it without processing it or they process it to sell later. Presently, the main market is the district capital of Angoche, where the fish is then transferred to inland markets such as Mogovolas, Meconta and Nampula city. There are also reports that the dried fish from this area is sold in the markets of neighbouring provinces of Niassa, Zambezia and in some districts of the distant (in relation to Kwirikwidge) province of Manica.

In the last years there has been an improvement in relation to the condition of the access routes to Kwirikwidge centre, despite persisting problems in the road that connects Angoche to Nampula city, particularly in the rainy season. The Kwirikwidge - Angoche road was rehabilitated as part of the Artesanal Fishing Project in Nampula.

3.2. The Value of the Product and Consumer Preference

Kwirikwidge centre, compared with other centres, is situated in an area which allows constant movement of traders. As a result, as mentioned in the previous study, the price of the fish there is relatively high.

The consumers' preference is for small fish. This, as earlier pointed out, is considered as one of the factors that motivate the use of mosquito net in this area, where most fishermen justify its use to catch anchovies.

Prices also vary according to the season of the year. In the rainy season where there is an increase in the catches, the price of the fish tends to go down, increasing only in the summer. In general terms, the price charged for fish at Kwirikwidge centre is below that charged in the markets of inland areas, despite the fact that the purchasing power of these populations is very low. The 1996 study did not present information about prices charged at the time, which would make it possible to carry out an analysis of its evolution. Only very recently, did the IDPPE branch in Angoche start regularly collecting the price of fish in the area under study.

4. Socio-economical and cultural attributes

4.1. Socio-economical and cultural Characteristics

The Kwirikwidge population is predominantly composed of fishermen of the Makwa ethnic group who, in general terms, profess the Islamic religion. Makwa is an ethnic group predominantly from Nampula province. It is composed of various sub-groups with own linguistic characteristics of which Kwirikwidge is a concrete example, as it belongs to an area, Angoche, of Makwa Koti, whose language variant is not accessible to the other autochthon of the province.

The fact that the majority of fishermen residing in Kwirikwidge are from neighbouring areas of Angoche and not makwa-koti, naturally influences the way the different fishermen families of the area under study live. It was not very obvious, but we noticed that the existing relationship is not of the type that Coley called face to face. The existing homogeneity and agreements are apparently the result of a common economical object, fishing.

The socio-economic structure in this area consists of (a) formal political, traditional and religious authorities, (b) owners of means of production, and property owners and (c) the rest of the population. In the latter group, we find peasant/fishermen, fishing professionals, seamen, the main labour force for the fishing activity. It should be noted that the owners of means of production, the property owners, due to their wealth and socio-economic influence that they have in the community, are currently the main social class in the area under study as, in the last analysis, they decide on various aspects, particularly economic ones.

The fishery workers, locally known as seaman, the local fish processors as well as women have no right to opinion or comment about common socio-economic aspects of the community. An inquiry about the problems affecting the community is made involving the populations but the decisions are analysed and taken by the property owners and the local authorities. Nevertheless, for political purpose, these classes are called upon to legitimize the demands of the most influential, the political leaders and the owners of means of production.

The existing socio-political and economical differentiation is a result of the local society differences in relation to the access and ownership of natural resources (particularly access to means of product for the exploration of the resources), social opportunities such as education and consequently, the access to information and decision making means, at local level, on various aspects of the community life as well as the influence of cultural-hereditary characteristics of that coastal society.

4.2. The economic weight of fishing in Kwirikwidge

The fishing vilage of Kwirikwidge consists of just over 260 houses inhabited by basic and extended types of families, totalling 1260 people with an average of 6 people per family. During our research, 98% of the people interviewed stated that fishing is the main source of family

income, which was even to finance other complementary activities such as farming and informal trade.

Information provided by the local organization of fishermen, indicates that Kwirikwidge employs 680 people (of which 170 are seasonal imigrantes recorded during the period of study) directly in the production, which corresponds to 8.5% of the total local population. To this, a considerable number of people (fishermen, processors, and ambulant traders) who normally imigrate, for short periods, to this fishing centre from various parts of Nampula province, in search of better income, can be added.

The lack of production infrastructures in the region, causes a situation of lack of employment alternatives in Angoche district, with serious consequences for Kwirikwidge, where the majority of the population is illiterate with possibility to resort to other type of activity other than fishing, family and subsistence agriculture and informal trade. Due to the ecological and climatic conditions of the region, coupled with the fact that the best and fertile land belong to big plantation companies or to individuals with greater financial power, the young people/men almost systematically have to resort to sea i.e. fishing, as a means of survival and economical independence.

On the other hand, there is an ever increasing importance of fish in the province and in the country as a whole, which enables the generation of imediate profits, despite their being lower than the desirable. This greatly contributes to raise the importance and role of artesanal fishing in the region under study.

4.3. Local Knowledge about the behaviour of the fishing resources

The results of our study show that all the people involved in the fishing activity are aware that that the fish that they economically depend on is part of renewablere natural sources. Our interviewees, particularly the elders, stated that there are inherited community methods which contribute to the compliance with conservation measures, regulations and allocation of natural fishing resources.

According to our informants (fishing community), their interaction with the fishing natural resources and related ecosystems based on adequate ecological, social, political, cultural and even economic conditions, has enables them throughout the centuries to acquire sound empirical knowledge about the environment in which they operate, the ecosystem and the behaviour of the marine resources they explore.

As until before the country's independence in 1975, artesanal fishing was not considered as a priority, little or no investment was made in terms of scientific studies which could provide valid data and aguments for the definition of adequate fishing methods for the rational use of fishing resources. On the other hand, the problem of institutional weakness on the control and monitoring of this activity in the region still persists. Consequently, the Kwirikwidge fishing

community has no other alternative than to resort to customary methods to defend the necessary sustainability of the increasingly shrinking resources.

The customary methods are based on a knowledge, enriched by day-to-day contact with the marine eco-system, which enables the fishermen to determine, with an impressive precision, the best location and periods for the fishing of economically viable species for the available market as well as the necessary fishing equipment for the available species.

This knowledge is based on the phases of the moon, the wind movement and the temperatures recorded in different periods of the year which are related to the behaviour of the marine resources.

4.4. Community habits in the use of fishing resources

According to local oral tradition, various rituals and myths related to phenomena like rain, drought, calamities and others, were found as an integral part of the socio-cultural way of life of the community under study. In the community's opinion, the control of the economical balance exercised by their ancestors is related to the control of natural forces. Therefore, the occurrence or non occurrence of certain geophysics phenomena is construed as being the good or bad will of the ancestors who are considered as the owners of the marine resources.

In fact, we were informed about the existence of myths, beliefs and customary habits which, among other functions, are an attempt to regulate the manner in which the fishing resources are utilized in the community. Basically, they are moral and social values culturally inherited and which are used by traditional religious institutions and even the traditional authority in the management of the fishing activity in Kwirikwidge.

Cultural phenomena reported in our 1996 study still prevail. We are referring to thanks giving ceremonies known as *Olomba*² and *Sataka*³, with the sole objective of asking for blessing of (their) gods and their surveillance over the destroyers of (their) resources.

These rituals, that in the past were religiously followed, are justified by the fact that the populations believe that as long as they please (their) spirits, all their wishes will come true. The rituals, according to the local community, mark their tradition and are considered as fundamental for their existence.

The Kwirikwidge fishing community is, in essence, rural and inhabites an area economically very dependent upon the fishing activity. But the production levels have become a problem and the local fishermen, particularly the middle-aged ou older, contrued this phenomenum as a result of violation of local customary and, consequently, desobidience to the ancestors.

According to their belief, to garantee success in the productive process, it is necessary to make certain ritual and magic practice to the spirits of their ancestors as well as respect certain myths

² A ritual aimed at securing good catches. It is led by a "Mwalimo".

³ A ritual, led by an "Imamo" (religious leader) with the view to protecting the nets and fishing equipments.

and beliefs so that their production aspirations are not countered by adverse forces. In their cosmological view, they believe that the ancestors determine the level of catches of the fishermen.

In our view, these cultural phenomena must be considered, at this community's level, as a traditional form of fishing resources community management and as an environmental protection and for compliance with social conduct measures established by the society. Most of the identified folk-tales, myths and custom encapsulated this type messages, which presupposes a high level of awareness of the need for resource preservation.

As a matter of fact, it seems that the religious phenomena give the community a social dynamic, as in the community's view the rituals and myths provide an explanation for existential questions about the world, human life and provide a sufficient spiritual and moral power to overcome day-to-day difficulties.

5. Agreements and Institutional Organization at Community Level

5.1. Power and Leadership Structure

Administratively and traditionally, the fishing community of Kwirikwidge depends on formal ("grupo dinamizador", local political parties' secretaries and other minor political bodies) and traditional institutions, both based in Morua. The traditional structure is headed by a traditional chief, seconded by religious leaders and their direct counselors. This is the structure with greater implantation in the community.

The traditional chief is the maximum authority of traditional power and in the recent past he enjoyed important judicial and religious functions and had also the responsibility of for the reinforcement of law and order as well as as symbol of unity in (his territory). He is the representative of the fundamental values that ensure fertility, prosperity, peace and justice in the community.

His counselors are normally individuals who belong to his direct lineage (mainly nephews) to whom the traditional chief can allocate territory and political and spiritual responsibilities for controlling the respective population, manage land utilization, the coast as well as to lead the various traditional ceremonies. This social class, generally composed of elders with vast experience resulting from the socialization with previous generations of chiefs, is in fact the manager of generally delicate community matters. The power of the traditional chief is counterbalanced by the counselors who do not owe him absolute obedience like the other subjects.

The religious leaders are charged with the responsibility of ensuring (a lot) of good fortune to the community as a whole, minimizing the occurrence of phenomena that cause death, soil and women infertility, scarcity of marine resources, etc. The Kwirikwidge religious leader plays an important role in the beliefs related with bad spirits. To that end, he needs to possess solid

knowledge about patent and latent human conflicts in his community as well as extreme sensibility about the emotions in question.

The religious leaders are an important social class in the socio-cultural and economic organization of the community under study as, generally, there are the epicentre of all critical events, at community as well as at individual levels. They are the guardians of the traditional values as they are viewed as the base for all to benefit from a plentiful life. Reports from the colonial period indicate that during this period the authorities made use of the traditional structure to launch their political and economical objectives in the area such as the control and management of the natural resources, including marine, control of labour force for various planned construction and production projects, and even for an efficient territorial administration.

According to our sources, the local traditional authorities cooperated with the colonial administration hence the persistence of their customary habits which contributed to their *modus vivendi* until the year of independence in 1975, when they started being discouraged. However, despite efforts from politicians, the traditional institution is “*de facto*” the most respected in the community in detriment to the then imposed formal structures.

5.2. Access to and ownership of natural resources

Contrary to what is happening in many countries of the southern Africa region, there are few studies undertaken on the ownership and access to artisanal fishing resources based on customary laws and other social relations before and during the colonial period in Mozambique. As a result, no documental information on the access to and ownership of artisanal marine resources is available for the area under study.

According to the local oral tradition, by the customary law, the management and control of the fishing areas/lots as well as other important natural resources, are the responsibility of the local traditional authority considered as the “real” owner of such property. It is on the traditional where the powers and competence in relation to the access to and use of the natural resources rest. In the last analysis, he is the one who decides over them.

It appears that in the past, among the powers of the traditional chief in relation to the fishing resources included the authority to approve or not to approve the negotiations for the allocation of fisheries in their territory. According to our sources, the local customary norms and principles did not “authorize” the use of fisheries by community outsiders.

After the country's independence in 1975, new socio-political, cultural and economical values were introduced in the country. In the socio-cultural and political spheres, the role of the traditional chiefs was connoted with the colonial authority. So, the Kwirikwidge traditional system was discouraged for the sake of a new mentality (free of obscurantism) which was to be inculcated onto the “*New Mozambique Men*”. The customary organization systems were considered as out-date, anti-progressive and inefficient.

In this context, the local traditional authority, lost its power and, consequently the authority that it had in “*its territory*” in favour of the new political structure, known in the country as “grupo dinamizador”, consisting of the secretary, deputy secretary, heads of residential blocks, youth, cultural activities and Frelimo party secretariat in the village.

After some time, mainly during the 1980s, the period of the escalation of the war, drought and famine in the country, the new political structures in the community started to facing some difficulties to carry out their duties, eminently political in nature, as the ecological context did not allow a social and cultural dynamic of the community members.

On the other hand, the local population always considered the *new* political structures as illegitimate and therefore, not recognised by their ancestors. The reduction of the catches and famine that devastated a majority of the local families, was justified as a result of the anger of the ancestors in face of the socio-political changes that had taken place after independence. Rarely do they associate these phenomena with the ecological, socio-political and economical factors of the time.

From late 1980s, when the new economic rehabilitation program, PRE, was launched in the country, and which entailed changes in government political philosophy of the time, the two structures (political and traditional) gradually begun to approximate and “co-habit” the same community space.

As a result of a new socio-political and economical dynamic in place in the country, and in face of the new socio-political and economical reality, there was a tendency of (re)integration of the traditional authority in the governmental community structure. This fact is not yet officially acknowledged by the political authorities of Angoche district, who claim the non existence of official promulgation of their operational regulation and coordination mechanism with the formal institutions and authorities.

Nevertheless, the traditional authority is there, occupying, once again, its socio-cultural space and role in the local community. As a concrete example, we were informed that in the last years, representatives of the traditional authority have been leading traditional ceremonies related with the local fishing activity and the process of the (re)implementation of measures that contribute towards the control and access to the resources.

5.3. Organization and partnership in the established co-management system

As a follow up to the recommendations of the 1996 study, and as a confirmation of the existence of local willingness and initiative with the view to the management of resources, the IDPPE began a process of sensitization of community members and fishermen aimed at a (greater) participation of these groups in the discussion of identified problems and the important decision making about

them. The suggested mechanism was the creation of Kwirikwidge resource management community committees and a district co-management committee⁴.

So, the area now has, from 1997, a fishing resources community management committee which IDPP refers to as local committee (LC), consisting of ten apparently elected members. The committee is headed by a chairman, supported by a vice-chairman, counselor, secretary, treasurer, voting members and the remaining members.

According to collected information, the general objective of this committee is to contribute towards the efficient management of the fishing resources available in its area of jurisdiction, among others, by:

1. Mobilizing and sensitizing the fishermen about the need to use fishing material and equipment that enable sustainable exploration of the coastal marine resources, i.e. fight the use of mosquito nets, “quinias” and “m’pururos”.
2. Discussion and decision making about problems/conflicts resulting from the nature of the fishing activity, per se.
3. Refer to the relevant authorities cases whose solution is over and above their capacity.

The dynamic of the process begun in Kwirikwidge resulted in a better organization of the fishermen of other communities which led to the creation of a district level co-management committee (which later evolved into an inter-district level committee) where the representatives of all community committees, including Kwirikwidge, meet with the governmental institution responsible for this sector in the district, such as, IDPPE, Institute of Fishery Research (IIP) and Maritime Administration (ADMAR). It is in this forum where discussions and decisions about issues of common concern in the region are made and a decision about referring to the Fishery Administration Commission (CAP)⁵ issues that are beyond the capacity of this forum is taken.

To allow a greater and better operationality of both committees, IDPPE and IIP technicians, designed sensitization and training activities for the extensionist working for both institutions as well as for representatives of local fishermen. The activities focused on the concept and experience on coastal marine resource co-management based on the experience of other regions in the world. Trips for exchange of experience with other communities, at internal and external levels, were also promoted.

Discussions about fishing problems in Kwirikwidge involve all the fishing community but, the decisions are taken only by the members of the local committee (composed of mainly by the owners of the more prestigious nets and fishing boats) and the other owners, sometimes in the presence of the traditional authority. According, to our research, by decision of the property owners, the seamen do not take part in these meetings. They are only informed of the decisions taken and are responsible for their implementation.

⁴ Which will be composed of representatives of all community committees of the district, IDPPE, IIP and Angoche ADMAR.

⁵ Created in light of the Maritime Fishing Regulation

The employers argue that the employees (the sailors), as do not risk any capital in the fishing activity, do not have the authority to give an opinion about marine resources management aspects. However, they (sailors) are of the opinion that as they daily deal with the resources and the marine ecosystem, they have better knowledge of the situation of the fisheries than their employers.

Therefore, in their opinion, they should not only be consulted in the process of discussion about resource management issues, but also be eligible to hold posts in the community committee so as to enable them to be represented in the co-management committee of Angoche district where their interests, as a social category with the added responsibility for the utilization of resources, would be safeguarded.

5.4. Local rules for the access to fishing resources

The results of the study indicate the existence of a series of locally established measures and rules attempting to reduce the negative impact resulting from uncontrolled fishing which took place in the area before the creation of the community committees in Kwirikwidge. In fact, some of these measures had already been identified by the 1996 study. The following are the measures in force in the area under study:

1. Prohibition of afternoon fishing;
2. No use of “quinia” and “m’pururu”;
3. Demarkation of areas of jurisdiction;
4. The need of a permit from the local committee to fish in the area;
5. The limiting to 40, the number of vacancies for fishermen who migrate to the area in the each fishing season;
6. The compulsory need to request the issue of a migration permit to local fishermen wishing to migrate to other areas outside the control of the local committee;
7. Total prohibition of under water fishing in the area;
8. Definition of minimum malhagem??? For the fishing nets;

It should be noted that most of the measures taken locally are, in fact, a result of the inefficiency of the local administrative authorities to implement the legislation in force (provisions of the 1990 fishing legislation and the 1997 Maritime Fishing Regulation). With the exception of the above referred measures 1,3,4 and 5, the remaining measures are provided for in the legislation. Even these measures (1,3,4 and 5), are implicitly safeguarded in the sector’s legislation under the Ministry of Agriculture and Fisheries (MAP), as regards the organization and planning.

As sanctions for the non compliance with the locally established measures, the committee charges amounts that vary between 7.000 to 15.000 mts (US \$0.8 to 1.2) apart from the confiscation of the fishing net for periods that may vary between 10 to 15 days or even the expulsion from the area, in case of reincidence. During our study, we were informed that some

committee members with management functions, had also been sanctioned for breaking the locally established rules. This served as an example to the others.

These are the most relevant local initiatives which are being implemented with the view to mitigating the negative situation resulting from over fishing and the abusive use of available resources.

6. Incentives for Cooperation and Interaction Standards between the Parties to the Co-management

The incentives for cooperation may be evaluated at various level among which the following: between the fishermen and the institutions connected with the administration and fishing management and between these and the artisanal fishermen.

6.1. Among the Fishermen

Among the fishermen, the reduction of the catches and the conflicts between artisanal fishermen and between these and the industrial fleet are still the main factor that provides incentive for them to cooperate⁶.

Some research suggest that the cause of reduced catches is the abusive use of mosquito nets. This type of conflict is born out of the concentration of beach seine nets in the same fishery, particularly at times of great migratory movement. The local committee has been promoting a series of activities aimed at sensitizing the fishermen about the need to remove the mosquito net cod end from their beach seine nets, and the fixing of limit of the number of vacancies for migrant fishermen. The committee also plays an arbitration role promoting consensus between the parts in conflict and resorting to the use of fishing permit to control migration.

The fishing permits are issued by the committee to all fishermen in the jurisdiction who intend to migrate. This document contains the identification of the fishermen including his behaviour, and to guarantee navigation safety, it is accompanied by the navigation slip provided by ADMAR. The fishermen must present his permit to the local committee at the destination place which will be responsible for controlling his behaviour during the period of stay in such place.

The other factor that makes cooperation and interaction between the fishermen necessary, are the conflicts between artisanal fishermen and industrial prawn fishing fleets in the Sofala bank. Conflicts of this level rarely occur in the Kwirikwidge area⁷ due to the topographic configuration of the fishing

⁶ It appears that the catches started reducing late 80s as a consequence of the war that forced inland migration to the coastal areas thus causing steady increase of fishermen and other individuals depending upon fishing at a time when continuous degradation of the maritime control and supervision services was taking place.

⁷ Recent data show that the 13 cases that occurred in the main fishing centres of Angoche and Moma districts in the first four months of this year (1999), only one occurred in Kwirikwidge.

areas which makes it difficult to operate industrial boats. However, the few times that these conflicts occur, they are not tackled efficiently which is to the disadvantage of the artisanal fishermen.

Among the factors that contribute to the persistence of conflicts between these two fisheries is the nature of the Maritime Fishing Regulation which authorizes industrial fishing up to 1 mile from the coast and the fragility of the current control and conflict resolution mechanisms.

Alternatively, the fishermen committees from PPAN area in coordination with IDPPE, submitted to the Minister of Agriculture and Fisheries a proposal for the extension of the minimum limit of operation of industrial fishing from 1 to 3 miles from the coast and the legalization of the use of half inch In replacement of the mosquito net cod end. These measures will be put on trial for one year and depending on the results achieved, their renewal or extension to other coastal areas may be negotiated.

The Provincial Department for Fishery Administration in Nampula (DPAN), a provincial institution of the National directorate for Fisheries, presented during the last session of the co-management commission held in Angoche in April 1999, a preliminary proposal about the conflict resolution methods. The advantage of this criterion will be the involvement of DPAN and, probably, the National directorate for Fisheries (DNP) in this process, a fact which has never happened in this region. However, it should be noted that, in our opinion, the mechanism is still complex and disadvantageous for the artisanal fishermen.

The procedures used to channel the lawsuit are winding, slow and demand systematic travel and contact with the industrial companies which are based in other provinces. On the onset, and due to financial constraints, this process places the offended artisanal fishermen at a disadvantage.

6.2. Between the fishermen (the Local Committee) and the government

The lack of material, financial and human resources for the implementation of a centralized management system has influenced the option for the participatory resource management system. For the fishermen, the co-management is considered as an important way for the decentralization and strengthening of their authority, and the integration of the local traditional norms of resource use into the formal resource management system of the country.

For the government, the co-management minimizes the costs of implementation and supervision of the resource management system and other socio-economic development packages, and the introduction of new standards of interaction between the government, organizations, economic agents and the fishing community.

The creation of the Fishery Administration Commission (CAP), was an important starting point in the process of the interaction between the government and the fishermen. CAP was created by Maritime Fishing Regulation of January 1997 with the objective of assisting and advising the Ministry of Agriculture and Fisheries in relation to regulation, management and conservation of fishing resources. This commission is composed of representatives of institutions related to fishery administration (DNP)

and research (IIP and IDPPE), artisanal, semi-industrial and industrial fishermen who meet four times a year.

However, despite the fact that there are provisions for the representation of artisanal fishing in CAP, experience shows that the not in all sessions of this body are the fishermen from the area of study represented due to financial constraints, as the sessions are always held in Maputo, situated 2,000Km away from Nampula. On the other hand, even when they are represented, they are rarely pleased as the main issues debated in the forum are always of the interest industrial prawn fishing, and never of artisanal fishing.

This situation was discussed in various forums, including in the national seminar on co-management. Due to the importance for the operation of the committee, it was suggested that this body be decentralized to provincial and district levels, with clear mandates.

Notwithstanding this situation, there have been improvements in the interaction process between the government and the fishermen. At the time of preparation of the present report, HE the Minister of Agriculture and Fisheries, approved the proposal for the extension of the exclusivity area for the artisanal fishing from 1 to 3 miles and the nets minimum size from 38mm to 12mm, which is an evidence of the political will in this process.

6.3. Between the sector's institutions and between these and the fishermen

The current structure responsible for the administration and research in the fishing sector was created, as mentioned in our 1996 study, in 1994 as a result of the socio-economic and political changes introduced in light of a program that was aimed at the rehabilitation of the economic framework of the time.

In this context, the Ministry of Agriculture and Fisheries (MAP) was created thus replacing SEP which was dissolved and stripped off the responsibility of fisheries administration. The MAP organigram, apart from the various directorates in the areas of agriculture and livestock, forest and wild life, is also composed of the following fishery sector institutions which have specific responsibilities:

- i) National Directorate for Fisheries (DNP), in general terms, responsible for the fisheries (management, licensing, inspection, supervision, among others). At the provincial level this directorate is represented by provincial Fisheries Administration Services (SPAPs) or Fishery Administration Department, as is the case in Nampula, working in direct co-ordination with ADMAR, an institution under the Ministry of Transport and Communication, which by delegation from MAP, is responsible for maritime supervision, artisanal fishing licensing and the implementation of fishing and maritime regulation in the maritime water of Mozambique⁸.

⁸ This situation is due to the fact that ADMAR is the only institution connected with maritime issues which has representation in the whole coastal area.

- ii) Institute for the Development of Small Scale Fishing (IDPPE), with specific responsibilities to promote the development of small scale fishing (semi-industrial and artisanal) through extension activities, including the promotion of co-management activities.
- iii) Institute for Fishery Research (IIP), is responsible for the research on the behaviour of the available resources for all fishing activities (industrial, semi-industrial and artisanal)

In 1997 the new Maritime Fishing Regulation (RPM) was published through Decree 16/96 of the Council of Ministers. Among other issues, it envisages the creation of a Fishery Administration Commission (CAP). This is an advisory forum to the MAP on issues related to planning and fishing organisation and it is composed by representatives from various areas and with economic interest in the fishing sector such as the industrial, semi-industrial and artisanal fishing, state institutions and private institutions.

The only weakness of this structure is the lack of institutional sensibility which, in our opinion, is the result of an inefficient co-ordination between the relevant institutions of the fishing sector which, in principle, should be the ones giving greater support for the consolidation of the process.

In the area of study, it was noted that difficulties still persist as regards the co-ordination between the intervention forms of the sector's institution (DPAP and AMAR) and the local committee in the management of the fishing resources. On the other hand, ADMAR appears most of the time to be carrying out tasks which normally should be done by DPAP. As such, it becomes difficult for the Local Committee (and/or the artisanal fishermen) to accept a clear idea about the authority of each one of these institutions, which, in general terms, limits the process of consolidation of local initiatives.

In our point of view, the lack of experience of these institutions in working with decentralised structures as well as the complexity of the process in itself, are the main factors which make the involvement of these institutions difficult. Thus, we suggest the training of the administrative authorities, not only of the local level, as it is generally recommended, but also those at the central level, where the ultimate decisions are taken.

Presently, the integration of DPAN into the local fishery management and administration system is under way. In this stage the transfer of DPAN headquarters from Nacala to Angoche where it will work in collaboration with ADMAR and other relevant institutions is in process.

The increasing need for the minimisation of conflicts also constitutes motive for the establishment of new forms of co-operation and interaction between the fishermen and ADMAR/DPAN particularly, for the integration of the latter into the present fishing resources management system.

To a certain extent, the co-ordination and interaction process between ADMAR, the local fishermen community is being fuelled by the fact that, among other members, the committees

involve the head fisherman⁹, who is also considered as ADMAR representative. He serves as the main liaison between the fishermen and that institution. Moreover, the inter-district co-management committee involves ADMAR, among other institutions¹⁰.

⁹ The head fisherman is a member of the community elected by the fishermen to control fishing activities in the area and provide relevant information to ADMAR.

¹⁰ There are prospects for the involvement of DDAP whose function in the co-management program is being clarified.

Summary Table of the incentives for cooperation and interaction standards

Levels	Incentive to cooperate		Interaction standards
	Influencing factors	Description	
Among the fishermen	<ul style="list-style-type: none"> - Reduction of catches; - Conflicts between the artisanal fishermen 	<ul style="list-style-type: none"> - Increase of the # of fishermen, use of mosquito nets; - Cexcessive concentration of fishermen in a fishery and net entanglement, movement of imigrants ; 	<ul style="list-style-type: none"> - Dessimination of the idea about the ban on the use of mosquito net s; - Establishment of fishing permit to manage and control migration ; - Extension of the minimum limit of industrial fishing from 1 to 3 miles from the coast.
Between artisanal fishermen and industrial fleets	Conflicts	<ul style="list-style-type: none"> - Area violation and destruction of artisanal fishing material by the industrial fleet 	<ul style="list-style-type: none"> - Discussion on the need for the establishment of a formal criterion which involves DPAP in conflict resolution; - Plan for the involvment of industrial fishing fleet owners in the co-management forum.
The government and the fishermen	<ul style="list-style-type: none"> - Inefficiene of the the centralized resources management system; - The increasing process of decapitalization of artisanal fishermen 	<ul style="list-style-type: none"> - Lack of material, financial and human resources for the implementation of the centralized resources management system. 	<ul style="list-style-type: none"> - Encouragemt of co-management: decentralization, strengthening and legitimization of local norms/traditions - Establishment and regulation of CAP. - Promotion of community committee and co-management commission - Need for legal framework for co-management systems .
Between the sectors' Institutions	Fragility of the maritime/fishing control and supervision services	<ul style="list-style-type: none"> - Weak presence of DPAP in resources management - Weak coordination between DPAP and ADMAR in the fisheries' management process. 	<ul style="list-style-type: none"> - Involvement of fishermen in the process of maritime fishing control and management - Involvement of DPAP in conflict resolution. - Need for the involvment of DNP in co-management forums.

7. Impact of the Co-management Actions

7.1. Sustainability

There is, in fact, a great sensibility about the need for preservation and rational use artisanal marine resources. This statement is based, for instance, in the fishermen's awareness about the danger of the use of mosquito net cod end in beach seine nets. During the first celebration of the international fishermen day (21 November), the representatives of the co-management committees of the PPAN area, prepare and signed, by consensus, a commitment document- known as the Larde Declaration- in which they commit themselves to definitely abandon the use of mosquito net cod end from 1st January 2000.

This position was strengthened by the recent approval by the Ministry of agriculture and Fisheries (MAP), on an experimental basis, of the use of half inch nets in the region in replacement of the minimum of 38mm in force. This measure is a value added for the sustainability of the co-management program under implementation as, it is a result of a petition from the fishermen themselves, who are increasingly believing the government commitment to this process.

However, despite the fact that the ban on the use of mosquito net has already begun in Kwirikwidge, the current process demonstrates that for the effectiveness of this measure, it will be necessary to guarantee not only a continuous availability of appropriate nets but also the identification and implementation of small credit programmes to mitigate the problem of the decapitalization of the fishermen. The adoption of the fishing permit (as a means of migration control) issued by the committees at the unit cost of 25 thousand meticaís, enables the raising of a small fund for the committees' self-financing, which will contribute to the continuity of resource management activities on a community basis, even with the phasing out of the project.

On the other hand, the "Fundo de Fomento Pesqueiro"/Fishery Promotion Fund, is receptive to the idea of providing at least 50% of the amount raised by each fishing centre, if the committees cooperate in the process, which will ensure increasing collection rates for the State revenue. However, there are not yet clear indications of the operation of the co-management inter-district committee after the PPAN, but MAP joint efforts are being made with the view to securing specific funds for the next three's budget.

7.2. Efficiency

The introduction of management measures at local level as well as the imposition of sanction in case of violation, constitute important factors for the implementation of the co-management system at local level.

The evaluation carried about in the context of this research, demonstrates a considerable reduction of the rate of conflicts between artisanal fishermen resulting from theft of fishing material, entanglement of nets during the fishing or disputes of fisheries between the natives and

immigrants. In the relation to the conflicts between the artesanal fishermen and the industrial fleet, the local committee in coordination with the inter-district commission have intensified discussions on the ways of solving and preventing this type of conflicts, which resulted in the submission and approval of 3 million proposal for industrial fishing.

However, the effectiveness of the initiatives being implemented in Kwirikwidge is hampered with constraints of legal natures. The committees do not (yet) have a legal recognition (for the specification of the respective mandates, powers and duties), which results in the lack of legal validity of decisions taken by such bodies. The delay in the provision of a legal framework for the committees is fundamentally due to the (yet) non-understanding of the concept, objectives and advantages of the co-management system by the relevant institutions of the sector, making the desirable development of co-management activities in the area under study difficult.

The persistence of this problem may lead to the breakin out of conflicts between the co-management parties. For instance, there are some who have started questioning the legitimacy and authority of the measures and mainly the sanction applied by the committee, while, in actual fact, there are appropriated institutions, with clear mandates but, due to human, financial/material constraint, do not make their presence felt in the field.

Nevertheless, efforts are being made at MAP with the view to obtaining clear and transparent official coverage which will enable the implanted structures to operate without violation of the fishing legislation or the country's constitution. IDPPE, in the context of the fishing project in Nampula province, has contracted a consulting company for the study of the legal aspects of the local co-management committees.

The objective of this consulting service is to gather socio-cultural and legal elements that will serve as input for a better analysis of the situation and better preparation of the necessary argument for a governmental decision on the powers and authority of the co-management of community committees at provincial and community levels.

7.3. Equity

Gradually, the co-management is being considered as an instrument not only for the rationalization of resources but also for consolidation of the process of participation and interaction between the parties involved in the management of natural resources.

The strategy use in the implementation of the committee (in the fishing centre) is helping the fishermen to understand the essence of the program and the co-management philosophy as well as the need for their participation in this process. For the time being, the committee is concerned with the resolution of fishing related conflicts, in spite of the occurrence of the gradual and automatic process of integration of other issues related to their activities.

Partly, this tendency is a factor that contributes to the consolidation of the authority and legitimacy of the committee in its jurisdiction.

Presently, the level of participation, in terms of numbers of the fishing population, in the meetings promoted by the local committee can not be considered as very high due to, among other reasons, the premature nature of the program and the lack of an information and extension system which can maximize the process of community sensitization about the amplitude of the tasks of the committee. However, the most important thing at the moment, is the fact that the majority of fishermen already recognise the committee as a body through which they can solve some of their problems.

Despite the above mentioned situation, there is a greater approximation between the sector's institutions relevant to the process (IDPPE, IIP, ADMAR and DNP/DPAP) and, between these with the fishing Kwirikwidge. We also noted the involvement in the process of a non-governmental organization, CARE, which is implementing a micro credit program in the region.

CAP¹¹, created in light of the Maritime Fishing Regulation, as an advisory body to the MAP on issues related to planning, regulation, management and conservation of fishery resources, is a forum where the parties involved in the co-management meet at least four year per year, despite the fact that not all the pilot areas where the co-management program is being implemented participate in the sessions due to lack of funds for travel to and from the meetings¹². And the areas that have attended this forum are rarely satisfied, as the issues under discussion are always of interest to industrial prawn fishing and never the artisanal fishing.

8. Final remarks

The results of the research demonstrated that the situation in Kwirikwidge is very encouraging, and can even be said that it exceeded the expectations. The following are the most relevant aspects resulting from the co-management program in the area under study:

- The creation of a fishin resources community management committes which operates is a liason with the government and other involved parties;
- A considerable part of mosquito net cod ends removed and sensitizing work with the view to the elimination of this practice by 31 December under way;
- There is a substantial improvement in the compliance with the fishing legislation in force by the fishermen, as witnessed by the drastic reduction of cases of violation;
- The fixing of a limit of of 40 as the number of immigrant allowed to fish in the centre which means that the centre has been demarked and control of the access to the location established;
- The rate of participation of the local fishemen in the discussions and decision making on thefishing activity of their ares tends to increase;
- Theft of fishing material and fishing acticity related conflicts between the local fishermen are a thing of the past.

¹¹ This commission is composed by the representatives of the fishery administration (DNP/SPAPs) and researchh institutions (IIP and IDPPE), and the producers (artisanal, semi-industrial and industrial) fishermen).

¹² Fishermen from Kwirikwidge and other PPAN areas have never attended this forum.

The positive impact, as can be witnessed below, of the program being implemented in Kwirikwidge was surprisingly fast at the PPAN region level, which encompasses Angoche and Moma districts.

- 12 more community committees created and consolidated; Some of these achieved organization and implantation levels high that that of Kwirikwidge:
- Creation of an inter-district co-management committee involving the sector's local government institutions, territorial and public administration and the fishermen;
- Improvement of the control of artisanal fishermen movement which contributes to the reduction of related conflicts;
- The submission and approval of the change of minimum malha??? For beach seine nets from 38mm to 12mm as well as the extension of artisanal fishing area from 1 to 3 miles, as a means of avoiding problems caused by industrial prawn trawling;
- The meeting held in Larde, in the context of the first celebrations of the international fishermen day, involving fishermen from Mongibual, Angoche and Moma. Important decisions on the fishing activities in the region were taken in this meeting These include the decision made of the unconditional prohibition of the use of mosquito nets in the region from 1st January 2000. A result, nearly 400 mosquito nets were removed in the region.
- Two district, one regional and one national level seminars on co-management of artisanal fisheries have been held in which various people, representing artisanal fishing, the sector's institutions and non-governmental organizations with interest in the fisheries' sector participated.

However, despite the encouraging scenario, the (still) non legal or official recognition of the established co-management community committees and the (still) non understanding of the concept, objectives and advantages of the co-management system on the part of some of the sector's relevant institution, hampers the desirable development of the a solid structure in the country as a whole and, in particular, in the area under study.

With the view to providing legal and social elements to allow to overcome these problems, in the context of PPAN, a consulting company has been contracted to carry out a study of the legal aspects pertaining the local fishing resources co-management committees and to suggest forms of inter-institutional cooperation in the process.

But, in Kwirikwidge, special attention must be paid in relation to the representativity of the different categories in the committee. Currently, this represent the traditional organization of the coastal fishing communities dominated by the traditional, owners of fishing nets and boats and/or influential members. Sailors, the important socio-economic group in the fishing activity, is excluded from the process, and is not pleased with the situation. We think that their involvement may contribute for the better achievement of the desired objectives of the program.

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