

CO-MANAGEMENT IN CONTINENTAL FISHING IN BENIN: THE CASE OF LAKE NOKOUE

CYRIAQUE ATTI – MAMA
Hydraulic Department, Cotonou-Benin

ABSTRACT

Introduction

This case study of co-management in Lake Nokoue in Benin comprises an introduction and 10 points based on the institutional analysis research framework. The introduction involves a brief historic recall of case studies, the reasons for the case study, and the methodology used. The 10 points which constitute the framework of the document are subdivided into three parts. The first part recalls the physical, biological and technical features of Lake Nokoue as well as socioeconomic and sociocultural context and fishing markets. The second part examines the institutional structures, organizational internal and external put in place for co-management, and the interactions between partners in a sociopolitical and natural environment in Benin.

Finally, the last part measures the impact of the co-management system put in place in examining the efficiency, equity and durability of the system. The conclusion comes back to the prominent points of the study and indicates some identifiable tracks.

Methodology

The study was carried out in six successive and interdependent phases: the documentation, development and the test of the questionnaire, the sampling and the choice of the investigators and informants, field work, the computerized counting and release of results and finally the reporting. Data compilation was essentially carried out using two tools: semi-structured interviews with an upkeep guide and structured interviews with the use of questionnaires.

Documentation

The documentation is limited and centered on the subject of the study. It is especially based on the document presented and discussed in November 1998 during a workshop seminar in Maputo (Mozambique) and whose objective was to favor standardization and comparison of the results of the case studies. During that workshop, many documents on the studies achieved in Asia and in other countries were provided.

In the case of Benin, the documentation was essentially obtained from the Fisheries Department, DIPA/IDAF and Lagoon Fishing Projects and this related to technical reports, political and strategic documents as well as the legal acts (laws) on fishing.

Semi-structured and Structured Interviews

Semi-structured interviews. This instrument has been chosen especially for an exploratory purpose, at fisher community level and at the level of the fishing administration. At the level of the fishermen, interviews were carried out on: the history of the setting up of fishing committees, their objectives, the structures which manage them, their working patterns and the activities carried out, the impact of the fishing committees on the activities of fishing and the involvement of women.

These interviews were conducted in groups or individually with men, women, the youth of all socioprofessional categories in the area. At the level of the administration of fishing and the center of Regional Action for

Farming Development (CARDER), the interviews with the persons responsible at different levels, were allowed to recall the genesis of the fishing committees and of appreciating the functioning of the system put in place.

Structured interviews based on questionnaires. The questionnaire was conceived in order to probe the issue during exploratory interviews. The subjects for questioning composed of the 10 charts of the document which presents the framework of the research. So the questionnaire addresses the following: biological, physical, technical, socioeconomic and sociocultural factors on one hand and institutional, organizational arrangements and their interactions on the other, and finally, the impact of fishing committees in terms of efficiency, equity and durability.

But this questionnaire has been found somewhat long and difficult to exercise especially with the addition of the scale-based performance indicators. About 270 questionnaires were addressed to the fishermen, both members and nonmembers of fishing committees in nine villages according to the sample.

Sampling and the Choice of the Investigators

The case study was conducted over 17 villages. For time and efficiency purposes, the study was placed on a least but sufficiently representative scale. The villages selected in the sample were on a reasonable basis but respondents in the villages were chosen at random. So, the 270 respondents to the questionnaires were chosen in nine (9) representative villages of the lake in the following manner:

- 6 villages among the 12 which already have the fishing committees, during the first case study and which are located at the periphery of the lake,
- 2 villages among the 5 villages situated at the periphery of the lake which didn't have fishing committees during the first case study, and
- 1 village in one of the peripheral villages of the lake and not selected in the first case study.

Six villages of the sample which have some fishing committees during the study were kept in their turn on the basis of criteria as follows: 2 have some committees which work very well, 2 of which the committees fairly work and 2 of which the committees don't work following the results of the follow-up vouchers put in place by the Fisheries Department. At the level of every village, 30 respondent fishermen were chosen on the basis of socioprofessional stratifications with the members of the committee bureau comprising 9 to 15 men and women. The 270 interviewed fishermen form the equivalent of 2.25% of the total number of fishermen on the lake.

Items of the questionnaire included questions that were technical in nature and required training for the enumerators, familiarization for the fishermen, as well as for those who have experience in the sector. Fisheries investigators, agents and technicians who had been in charge of fishing committees were therefore chosen. These agents have been used both as investigators and secondary informants after the key informants (i.e., the fishermen).

Computerized Perusal and Release of Results

The very number of the questionnaires (270) and their volume (12 pages each) requires a system of fast and efficient perusal. The progical statistical package SPSS/PC (Statistical Package for Social Science) which enables the analysis of information in both the quantitative and qualitative sense was used.

Nevertheless, difficulties were faced as follows:

- A lack of technical understanding required the hiring of a computer scientist program conception based on the questionnaire and findings, and
- The relatively long time taken between registration of data and exit of results.

Physical and Biological Factors on Lake Nokoue

Physical Environment

Lake Nokoue is the largest inland water system of south Benin and covers an area of 12 000 acres. It is situated northeast of Cotonou city, and bound on the west by Abomey-Calavi, on the east by the Porto-Novo Lagoon

(which is linked by the channel of Toch ), in the north by the Oueme and So flood plains, and in the south by Cotonou city. It is also connected to the Atlantic Ocean by a channel. The habitat that Lake Nokoue offers is varied and is composed of sandy, sandy-muddy and muddy bottoms. (Refer to the influence of *acadja* on the ecosystem).

Lake Nokoue is in the humid tropical climate zone of southern Benin. The temperature of these waters which alternates between fresh and brackish, varies between 27°C and 29°C. It has an average depth of 1.5 m. Fishing is carried out throughout the year but the waters yield more when the level is low, that is, from November to June.

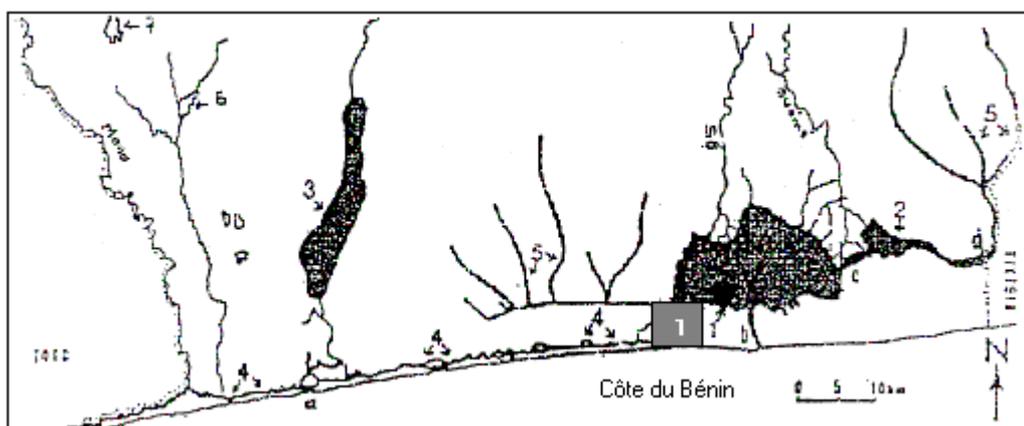


Fig. 1. Lac Nokoue

Resources

The catches from Lake Nokoue are multispecies with two large species types, i.e., sedentary and migratory. Species caught in Lake Nokoue are largely sedentary and mainly composed of *cichlidae*. Migratory species in turn are of two kinds, *clupeidae* and *penacidae*. Out of the 30 species caught on the Lake, three are predominant, i.e., *cichlidae*, *clupeidae* and other crustaceans representing about 85% of the production.

The German aid agency GTZ-financed Lagoon Fishing Project was a study on the fish population dynamic in the Lagoon complex. Conclusions from a follow-up of the catches from 1988 to 1998 indicate an average increase of the size of *S. melanotheron* among the catches from Lake Nokoue. This situation occurs because of the exercise of the *acadja* technique practised on inland waters. There is no doubt that the *acadja* contributed a big part to the repopulation of the fisheries. From 1995 till present a kind-of “stabilization” pertaining to the size of the fish has occurred in the inland water.

Generally, it is observed that the resources of Lake Nokoue suffer heavy pressure with the increase in the number of fishers which numbered some 13 500 in 1997 and the entry of new people into the fishery as a result of insufficient measures to limit access to the resource. When surveyed, 75.56% out of 270 respondents think that the quantities of catches at every exit are less than before, whereas 89.26% found that fish caught are less “thick” than before.

As for the fishermen of Lake Nokoue and others, access to inland water is free and open to everybody because according to their beliefs, inland waters are accepted as a “gift from God.” But with the upsurge of fish breeding boughs (*acadja*) the spaces covered with *acadja* become exclusive and even transferable properties for some alleged owners. This has direct consequence, such as encouraging conflicts over access to the resources between fishermen net users and *acadja* owners.

The Techniques of Exploitation

Fishing on Lake Nokoue is carried out on an artisanal basis using various simple technologies. The gears are often operated by individuals or small crew (2-3 persons) in dugout canoes.

The basic material, that is, the dugout is possessed by nearly all the fishermen (93%), with each one having an average of two dugouts, as the dugout is used as a means of transport for the majority of them. As for the fishing material in general 99.63% of respondents own dugout canoes.

Table 1. Types of fishing gear

Order	Type of material	Number of fishermen owners	Total number of gears	Minimum number	Average number	Maximum number
	Dugout	252	402	1	2	8
1	Fishhoop net	152	9 336	4	61	600
2	Sleeping net	129	1 844	1	14	160
3	Cast net	123	332	1	3	25
4	<i>Acadja</i>	108	140	1	1	10
5	Big net	61	16 717	1	274	1 000
6	<i>Acadja</i> net	23	196	1	9	25
7	Trailing net	21	167	1	8	43
8	Shrimping net	17	341	21	20	60
9	Fishing hole	9	20	1	2	10
10	Line	7	494	2	71	200
11	Hurdle	4	134	20	34	44
12	Paddock net	1	1	1	1	1
13	Landing net	1	2	2	2	2

Source: Findings of the study.

The fishing techniques used on Lake Nokoue can be grouped into four categories as follows: i) the net: stalled nets, trailing nets, cast nets; ii) the hoop: fish hoops, shrimp hoops; iii) fishhooks: line and palangre, iv) traditional fish breeding: *acadja* and fishing hole.

Socioeconomic and Sociocultural Factors

Direct Operators on Lake Nokoue

Users of Lake Nokoue are as varied as they are multisectoral. However, key users, i.e., those having activities directly linked to fishing are the following: fishermen, women fish merchants as wholesalers, sellers peddling different products, transporters of boughs for *acadja*, and operators of Lagoon sand quarry.

The fishermen on the lake are greatly heterogeneous. The majority of the population falls into four ethnic groups: the Ouemenou (32.96%), the Goun (32.22%) living close to the east, the Toffin (24.07%) and the Hxla (8.15%) inwards and to the west of the lake. The main religions are: Roman Catholicism (37.04%), Protestantism (20.74%), animism (19.26%), Celestial Christianity (a sect), (12.59%) and Islam (7.41%).

The examination of the social mobility indicators, notably the rate of migration, shows a sedentary population having a long tradition of fishing. Indeed, 91.48% of people interviewed live in their village since birth with 8.52% having already migrated from their village and did so for better welfare, job opportunities and a better fishing area. Their ancestors had settled in the present fishing village since a long time ago. Their great grandfathers number some 63.70%; their grandparents in turn 21.85% and their fathers 2.96%. So, most of the present fishermen on Lake Nokoue have a long established fishing tradition that spans more than three generations.

The majority of fishermen descendants of the lake (66.30%) live in the village, against 27.78% who live out of the village. The reasons why the sons and daughters of fishermen are living outside their place of birth are notably: marriage (30.26%), training for a profession (27.63%), school attendance (25.01%), looking for jobs (23.69%). This exodus could be qualified as regional because most of them are settled in a radius of 100 km and in some rare cases as far as in Nigeria. So a part of the demographic growth is absorbed by the regional and intraregional exodus phenomenon.

Fisher Household Income

The objective of this study is not to calculate fisher incomes, but to understand constituent elements of their incomes and especially to appreciate the fishing proportion in the whole case. In that case, as far as the fisherman income sources are concerned, the results of the study put on top fishing activities (64.90%), then agriculture (31.11%) and commerce in a regressive proportion. The following Table 2 gives precision on the propositions.

Table 2. Families' income share from fishing

Income	Size	%
More than half	121	44.81
Half	47	17.41
All	47	17.41
Less than half	42	15.56
None	11	4.07
Unable to answer	2	0.74
TOTAL	270	100.00

Source: Findings of the study.

As for productive income activities two situations need to be considered: Fishermen living on the lake get most of their income from fishing, to which trade in products of basic necessities may be added. As for those living at the periphery of the lake, fishing and agriculture are carried out together where one supplants the other according to the seasons. The time allocated for fishing essentially takes the same duration.

For the people interviewed fishing takes an average of 7 hours and a maximum of 15 hours, if one takes into account fishing in both the day and night times.

Fishermen of Lake Nokoue depend on their own income, because in 96.3% of cases, the family does not receive money from any other family member living outside the household.

Possessions and Wealth of the Fishermen Households

The fishermen's dwelling is usually considered poor due to the precarious state of their habitat, the hard lives they lead and because of a lack of minimum sociosanitary infrastructures.

Habitat

The Lake Nokoue villages and those of its vicinity are characterized by three types of habitat: a) houses built with strong materials: concrete walls (24.07%) sheet-metal or tile roofing (43.33%) and cemented floor (24.82%), b) houses built with semi-strong materials: banco walls (12.96%) straw roofing (41.85%) and mud floors (22.96%). These are largely found in villages located alongside the lake; and finally c) houses made of wood or bamboo (54.07%) straw- or sheet-metal roofing and wood-lath soils (38.52%) in the lake villages or flooded areas. This last type of habitat is prevalent on the lake.

If this type of habitat is quite adapted to the local conditions, it is not equivalent to describing the state of destitution of the local population.

Household (electrical) appliances

Ownership of these appliances, which are essentially a feature of modernization is nearly nonexistent on Lake Nokoue. Indeed, their utilization requires the provision of electricity which is unavailable except only in the fishing villages situated in the bigger clusters. Out of 270 people interviewed, 42.59% do not own any household appliance, whereas 41.48% possess a radio set, 17.70% have a radio-cassette player, 4.07% own a television set, 0.74% have a full recordplayer and 0.37% own either a refrigerator or a recordplayer.

Means of transport

The means of transport most currently used in that area is the dugout canoe which assists in the mobility from house-to-house in lakeside villages, from one village to another or to go to the neighboring big towns.

Out of 270 respondents, 252 (93%) own some dugouts for fishing and as a means of transport. Every one of them own a minimum of 1 dugout, a maximum of 8 and an average of 2 dugouts. Other means of transport for the fishermen include bicycles and there are very few motorcycles.

Fishing materials

Contrary to their counterparts in the agricultural sector, the fishermen and even artisanal fishermen make some huge investments with the working materials and quite often to the detriment of their habitat and life comfort. The correlation between the material owned by the fisherman and the state of his wealth gives way to the following typology of the Lake Nokoue fishermen.

Table 3. Typology of the fishermen

Socioeconomic status	Number of gears owned	Nos.	Percentage
Wholesale fish merchants	-	2	0.74
Poor fishermen	1	56	20.74
Medium income fishermen	2 to 3	183	67.78
Rich fishermen	4 to 6 and +	29	10.74
TOTAL		270	100.00

Source: Findings of the study.

The evaluation of the cost of each type of fishing material facilitates the appreciation of fishermen's investments from FCFA500 to FCFA1 200 000 (see Appendices 1 and 2). However, it is necessary to note that the cost of installation of one *acadja* is owned by 39.63% of the interviewed fishermen. Fishing materials used by the fishermen on the lake constitute some 94.8% of their own individual property; against 2.60% of inherited family property. Cooperative property does not exist except for the case of some fishing holes earmarked for a common communal goal.

Other properties owned by the fishermen

In addition to their fishing materials, the fishermen own many other properties. Thus, 53.33% of fishermen are landowners, the typical fisherman owning an average of 24 156.30 m² of land mainly used for agriculture, an additional activity for the fishermen living mainly in the surrounding villages.

Apart from some fishermen who own plots of land, 11% of the people interviewed own other assets such as: livestock, fruit orchards or palm groves, spatial access in the shallows (for harnessing of the fishing holes), generator sets, motorcycles, houses for rent, maize grinding mills and even boats for charter. Valuation of the cumulative assets may revise the perceived state of poverty among fisher communities in relation to the agricultural sector.

Features and Attitudes of the Fishermen

The people of Lake Nokoue have some fundamental features which qualify them as a complete community of fishermen.

A long tradition of fishing practice. Most of the fishermen have been fishing for a relatively long period: 9.63% since birth, 72.22% before the age of 20 years and 17.78% after 20 years of age. In addition, 87.78% of people interviewed during the study had never carried out any other activities not central to fishing. The remaining 12.22% were involved in alternative activities. They include newcomers who notably came from the agricultural sector and are involved in the trading of articles and artisanal occupations such as carpenters, tailors, bricklayers, auto mechanics, electricians and so on. However the market is often quickly saturated for the abovementioned occupations.

The attachment of the people to their fishing occupation is not only because of tradition but also because fishing remains the sole occupation for a large number of them. Even if it were possible to change their profession, about 68% still stated their commitment to fishing. The reasons given to retain employment in fishing may be grouped into several categories as follows:

- Fishing constitutes for them a source of income and livelihood
- Fishing is the occupation they had learnt and they are used to it
- Fishing is more profitable and offers more income than agriculture (see Appendix 3)

However, 68% of interviewed fishermen prefer other options for their sons if available. Here, 20% would tend to agree to their sons' personal preferences, 14% would wish them to be fishermen as well, whereas more than 60% would prefer occupations apart from fishing, notably those with paid salaries and better remuneration.

A high rate of illiteracy. Benin, like most African countries has a relatively low school-attendance rate. At the national level, official figures indicate approximately 56.01%. This rate is 68.43% for men against 42.71% for women, and hides a high disparity according to socioprofessional categories or gender.

At the national level the fishermen of Lake Nokoue are not the most affluent. At the formal education level, out of 270 interviewed fishermen with their 401 wives, the following school-attendance rates were presented:

Table 4. Fishermen school attendance rate

Educational Level	Nos.	Rate
Noneducated	208	77.04
Primary level	45	16.67
Secondary level	17	6.30
TOTAL	270	100.00

Table 5. Respondents' wives school attendance rate

Educational Level	Nos.	Rate
Noneducated	380	94.76
Primary level	19	4.73
Secondary level	2	0.49
TOTAL	401	100.00

Source: Findings of the study.

When looking at the two tables, the fishermen and their wives (671 people) total 9.98% of school attendance, that is to say, five times less than the national average, whereas the wives of the fishermen present a rate eight times less than the national average at the level of women. This illiteracy constitutes a handicap to the development of the fishing sector, where the rules and legal measures are written in a language unintelligible to 90% of fishermen.

Household sizes. Another feature worth mentioning is the size of fishermen community households. The 270 interviewed people during the survey have 401 wives, all in all 2 767 persons. Their households have an average size of 10 persons with a minimum size of 1 and a maximum of 54. These different rates, in comparison to the national averages present a wide gap (see Appendix 4).

Attitudes toward mobilization and innovation. Fishing activity, including artisanal fishing is a group activity. Fishing is often possible with a group of two or three people and even more for certain types of fishing. So far, their activity requires putting efforts together, complimented by the communities' propensity to mobilization. About 96% of people interviewed think that the population of their villages can be gathered to solve either the problems of their villages or other fishing-related problems. Such predispositions should favor community management.

The Lake fishers' susceptibility to innovation is essentially demonstrated through two fishing techniques: the *acadja* and mesh net called *Medokpokonou*. The *acadja* is a form of traditional fishbreeding typically Beninese. Used extensively on Lake Nokoue, it reveals an ingenious manner of creating a favorable ecosystem for the production of big fish unlike modern fish breeding.

The mesh net *Medokpokonou* in a funnel-shaped form utilized in circulating water. The major inconvenience it presents however is that the meshes are very small and therefore entrap everything including the juvenile species.

Marketing of Fisheries' Produce

The artisanal fishing on Lake Nokoue constitutes commercial fishing. The marketing of fish can be considered at two levels. Primary marketing, i.e., from the producer (fisherman) to the seller (wholesale fish merchant) and secondary marketing, i.e., either from the wholesale fish merchant to the consumers or to wholesalers directly. The marketing channel involves two main actors, i.e., the fisherman and the wholesaler.

Primary Marketing

At least 75% of smoked fish is sold on the lake with more than the half (69.24%) from the fisherman to the wholesaler. The fishing produce constitutes 59.63% sold on the fishing place and 36.30% when the fishermen are back in the village. At that level, the marketing is nearly carried out entirely by women with the exception of shrimps which are marketed by some fishing companies based in Cotonou town. The customers are also mainly women, with up to 32.52% of fishermen and other women living in the largely diversified community. It was revealed that 36.67% of people interviewed were attached to the same customers.

The main reasons attributed by the fishermen and which result in loyalty towards the same customers are as a result of the following:

- a. Their wives contribute to the household sustenance,
- b. Their wives participate in the marketing channel,
- c. Their wives and other women assist them in the time of crisis by offering credit, and
- d. Mutual confidence.

Though the price of fish is fixed mostly, i.e., 64.44% by the fishermen, it is subject to lengthy bargains from the wholesale fish merchants. Due to the lack of standard weights and measures like the kilogram, the criteria for fixing fish price are therefore based on its size (thickness), species, quality and period signifying abundance (or rarity). As for the wholesale fish merchant, the criteria which determines prices are supply and demand factors, the state of the market in the previous day, profit-to-gain and the perishable aspect of the commodity. After all,

the fisherman is influenced by the wholesale fish merchant as he remains a part of the consumption market and the produce he offers therefore is perishable.

That is why, though the majority of the interviewed fishermen are satisfied with the present prices (88.89%), a minority (8.52%) remains dissatisfied because according to them the price of the fish is too low and inadequate, making selling fish an unattractive occupation. In order to find a solution, the fishermen suggested that fish should be sold by the kilogram, which offers better commodity conservation and the diversification of the market.

Therefore, this primary marketing stage is dominated by customer relations, that is to say, search for profit, nevertheless greatly attenuated by family relationships, apart from the valorization measures imposed on everybody.

Secondary Marketing

The fish sold to the wholesale fish merchant is marketed in two different ways: fresh fish or processed fish. It is at that level that a real fish market is observed. A large part of fish and shrimps fished on Lake Nokoue is sold fresh and so the fact that Cotonou and secondary towns like Abomey-Calavi and Godomey are close to the lake is advantageous. The remaining fish is transported smoked or fried and sold most of the part in regional markets such as Parakou, Tori and Ouègbo; as well as in interstate markets.

Characteristics of the Fish Market

Two aspects seem to characterize the fish market on the lake: a highly-organized channel managed by fishermen's wives and customers who are perpetual fish buyers.

In order to take advantage of the opportunities offered by consumer proximity, wholesale fish merchants have their own means of transport (dugout canoes) and are quick to intercept fish landings so as to bring fresh fish to the market as rapidly as possible. This is due to the predominance of fresh fish marketing, which is deemed more profitable, as opposed to smoked fish, which requires additional processing.

Cotonou and its surroundings are undergoing rapid development and as such, offer potential customers at once to wholesale fish merchants. Moreover, those customers seem to have developed a preference for fresh produce from the lake. Closer analysis shows that the fisherman is often disadvantaged, with a limited market and often disturbed by the complexities of family relationships.

Institutional and Organizational Structures at the Community Level

Fishermen villages constitute the smallest entities of the territorial administration. Communities who live there are under state authority and enjoy all the rights conferred by the country's constitution, mainly the freedom of speech and organizational right to assembly. At the level of these communities there are three types of administrative powers, i.e., the local administrative power, religious and traditional powers, and the movement of organized associations.

Local Administrative Power

Benin's territory is divided into regions, subprefectures, township villages and city districts. At these different levels, there is a state structure with a corresponding administrative power. At the level of the villages like the case of the fisher communities, there is a village chief with elected counselors who are the state representatives. This institution has a main role, i.e., to administer the territory, to channel orders coming from the state to the population or concerns from the populations to the leading body, to ensure population security through conflict resolution. It is a modern state authority and as such takes the place of the traditional power which has somewhat become a remnant, occasionally entering into conflict with the latter. As a legal entity, this power is imposed on all and legitimizes any other power structures within the community.

The procedure of decisionmaking is democratic, and usually based on mutual consent and sensitizing issues via consensus. However, this is an enforcement arm, i.e., the State police force to which it may refer to at any time in cases of need. The resort to justice remains a possible avenue to settle problems in relation to legal matters.

The structure of the administration is the established organization at the local level so as to serve like a partner in the co-management process. Fishing committees have been put into place under its authority without any interference. The local administration like the central one has no local regulation for access to aquatic resources of the lake, neither the rights to fishing and/or provisions to exclude a group of people or individuals. It can only propagate management measures taken at a central level and which is made known to it.

Traditional and Religious Powers

Before these two types of power were intimately linked and cannot be separated from each other. The belief in gods (particularly the water deities) was almost generalized. The law which governs traditional societies and notably the fishing activities originate from beliefs in these deities. The fear of “divine” punishment constrained the population to follow the rule of law and development measures within the society.

Today, the traditional power is supplanted by the modern power and is therefore relegated to the past. The appearance of new religions and religious sects has resulted in an apparent “demystification” of the society. Out of 270 people interviewed in the course of the study, 19.26% still follow traditional religions based on idolatry. With the weakening of traditional values, several measures are no longer adhered to, e.g., the prohibition of fishing in some sacred identified places, prohibition of shallow fishing, i.e., privileged places for reproduction and repopulation and the respect for a rest day from fishing activities.

In spite of the decline of traditional religious influence, there are still some remnants of past practices. Of those interviewed 44.44% think that cult practices still exist which influence fishing activity.

The significance of the number of people who defend traditional rituals as opposed to those that exercise traditional religions (19.26%) prove that the former faiths rarely influence existing religious precepts held by these communities but on the other hand, more recently-emerged religions are not easily established, though adhered to by a large number of people. Traditional leadership structures are no longer significant terms of reference and they therefore give up room to newer types of powers structures such as the state and associative authority.

The Power of the Associations

Fishermen associations are numerous in fisher communities and date back a long time. They are derived from the modern authority that supports freedom of speech and association.

These associations have a high cooperative feature, as their first objective is to defend the interests of the fishing body. In that point of view, they differ from groups within traditional societies which usually aim at putting together the physical efforts as opposed to defending ideals.

Previous fishermen’s associations before the fishing committee. After the failure of the fishing cooperatives in the 1960s due to the rise of socialism, the fishermen were grouped in fisher associations according to the categories of fishing. The proliferation of *acadja* on the field led to a number of conflicts between the fishermen who practised the *acadja* system on the lake. Arbitration of these conflicts by the fisheries administration was nearly impossible and agreements were rare. The sole resort offered to fishermen is the creation of separate associations for different kinds of fishing technologies.

Table 6. Fisher associations

Order	Kind of association	Observation
1	Cooperation group	NOT INSERTED
2	Cast nets-owners association	
3	<i>Acadja</i> -owners association	
4	Hoopnets-owners association	
5	Sleeping net-owners association	
6	Shrimp nets-owners association	

7	Fishing holes-owners association
8	<i>Medokpokonou</i> nets-owners association

Source: Findings of the study.

As seen in Table 6, the main kinds of fishing technologies used on the lake are defined by association. The preoccupation of each of these associations is neither the promotion nor protection of fishing interests in general but of the association concerned. This erodes any potential synergistic relationships between the associations.

More and more associations exercise authority in the fisher communities. The fishing committee receives assistance from almost all the fisher associations, notably those with which it defends the same interests with the support of the local administrative authority. The internal partnership created therefore receives the support of an external partnership.

External, Institutional and Organizational Structures

In Benin, the structure which governs and regulates the life of the nation is the national Constitution which defines the general rules at the economic and sociopolitical levels. Benin is essentially a state with separately-distinguished legislative, executive and judicial powers.

Today, the State authority is preparing to put in place the structures of a decentralized state. Between the three powers (legislative, executive, judiciary) there exists some complementary relationships and mutual control.

Structures Directly Linked to Fishing

Benin's organic law defines the ministerial departments. The department which concerns fishing is the Ministry of Rural Development (MDR) which has the power to define development policies and promote the subsectors of agriculture, stock farming and fishing. The national structure directly responsible for the fishing subsector is the Department of Fisheries. As a national agency the Department of Fisheries has the following responsibilities:

- Looking after the implementation of the fishing and aquaculture regulations,
- Monitor the execution of all fishing and aquaculture-related development programs, and
- Assure the sanitary inspection of all products related to the fisheries industry.

In order to realize these objectives, the Fisheries Department has to have adequate human resources with some expertise directly related to fishing. It receives from the State an annual budget for operations. The main funding comes from partners for development through projects. This external financing is however more inclined to go into multisectoral regional projects. The financing lodged and executed by the Fisheries Department are those comprising an important part of institutional assistance and improvement of staff expertise in the sector.

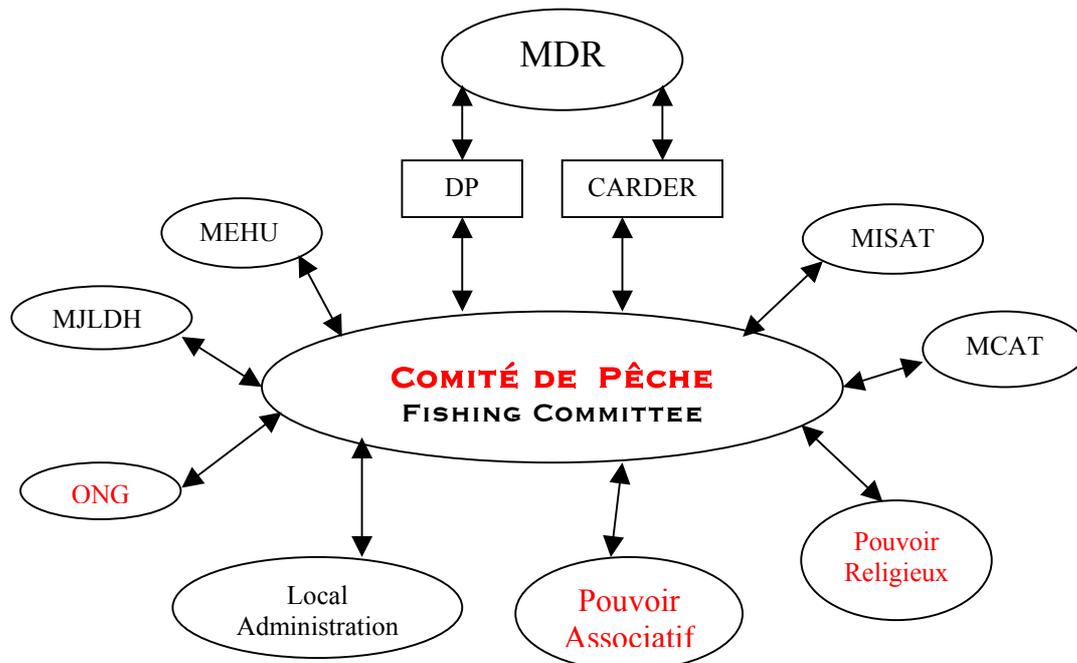
So it is at the national level that the Fisheries Department has a real influence on fishing, i.e., through a defined sectoral policy and the regulations it implements. The implementation of these policies and regulations are carried out by a regional structure under the same ministry. However the co-management of fisheries deriving from a development strategy is not only on the initiative of the Fisheries Department but subsequently evolved from the same department. The Fisheries Department essentially supports the fishing committees via the following measures:

- Mobilization of the fishermen and mooted the idea of a fishing committee,
- Setting up of the fishing committee,
- Training of the fishing committee members on their attributions and functions,
- Follow-up and monitoring on the field, and
- Physical and moral support during the settlement of conflicts, even before the jurisdictions.

Another unit in charge of its promotion at the basic, subregional and regional levels is called the *Center of Regional Action for Farming Development* (CARDER). Like the Fisheries Department, CARDER is a technical

structure of the Ministry of Farming Development. Between them only the functional horizontal relations exists. The regional center has the responsibility of promoting agriculture, followed by stockbreeding and fishing. In this center fishing has relative importance only because of the emphasis within a given region. The CARDER is essentially responsible for concurrently promoting the three subsectors of agriculture, stockbreeding and fishing.

At the fishermen level, they look to the Fisheries Department and Center of Regional Action which are directly responsible to them for policies and projects. The specific parts played by either party are however often confused or disconcerted to the fishermen, since the same officers implement briefings which originate from two different entities.



- MDR = Ministry of Farming Development
- MJLDH = Ministry of Justice Law and Human Rights
- MEHU = Ministry of Environment, Housing and Urbanism
- MISAT = Ministry of Internal Affairs, Security and
Local Administration
- MCAT = Ministry of Commerce, Craft Industry and Tourism

Fig. 2. Partners in co-management

Non-fisheries Structures with Influence over Fisheries

Apart from tutelage structures of the fisheries sector, two state structures exist which mandate fisheries-related activities. They are the Ministry of National Security and the Ministry of Justice.

In Benin, the ministry in charge of local administration is equally responsible for security at the national level. The local administrative authority has several ramifications up to the basic level. As for the security aspects, it is from the State police force at the subregional level (subprefecture) that the security over people and properties are ensured up to the most basic level of village. Currently security forces play two roles beside fisheries' administration bodies and fishing committees. In cases of conflicts which go beyond amicable settlement at the village level, it is up to the State police force or to the police as a security force itself to resolve, even by ruthless or repressive means.

Secondly, during some police controls on fishing organized by the Fisheries Department with the fishing committees, the State police force is associated so as to guarantee security in the course of the operation and to

stand as a dissuasion force. Without any value judgement on the implied effects of such an intervention, it appears that these institutions are acting in the course of their mandate in a legal manner.

Another state institution to which the fishing committees refer to is the Justice Ministry with related structures established at a regional level or prefecture. Cases of trials brought to court and mentioned by the persons responsible in the fishing committees in the course of their duties are rare and concern only isolated incidences of seizures of prohibited nets.

In these cases, the recourse to justice in cases of need is normal, as legal matters remain highly emphasized in Benin.

Other external influences over local authority structures and communities are the political parties, notably when electoral consultations approach. These talks are demagogic in nature and frequently question legal arrangements, making rather unrealistic promises before the fisher population becomes disillusioned with unfulfilled promises.

A few years ago, fisheries on Lake Nokoue was impacted unfavorably as a result of several segments of the local populace primarily dwelling on stilts. Tourism agencies in both the public and private sectors are interested in the villages on Lake Nokoue. Among the activities organized by these agencies include the development of excursion tracks on the lake, building of tourist centers and organization of local festivals in the vicinity of the lake.

This revival of tourism has a sure impact on fishing activities, marketing of fisheries produce and the life of the community as a whole. These activities are legally permissible in a free-market economy such as Benin.

Donor Organizations and Co-management

The main sources of development aid are from external donor organizations. In this regard these organizations take part in the promotion of co-management arrangements applied in Benin. A case example would be the Lake Fisheries Project currently applied in Benin since 1987 funded by GTZ, the German donor organization. The fisheries administration, despite promoting the idea of fishing committees, has to concede that this was only made possible as a result of the GTZ support.

The support brought by this project to the co-management structure applied since 1993 encompasses the technical, material and financial aspects. It translates into financing for the training of committee members, the supply of logistics to field agents, follow-up and for the development of this system on the lake complex as a whole.

Legal Roots of the Co-management System in Benin

In the course of this study in 1996, one of the major issues raised by fishermen involving co-management and which hindered its implementation was the structure's apparent lack of *locus standi* (legal standing). Progress nevertheless has since been made. Since September 11, 1997 the ministerial order NO. 312/MDR/MISAT/DCAB/CP which governs the institution, attribution and functioning of the fishing committees and councils in the Republic of Benin provides the following in Articles 1 and 2:

Article 1: Some fishing committees are established at the level of villages or group of villages as users of the Benin continental inland waters, some subprefectorial committees at the subprefecture level or city local government, and the fishing councillors at the level of each region in the Republic of Benin. The fishing committees and councils are responsible for the implementation of the regulation and management plan.

Article 2: The fishing committee is made of representatives of fishermen users of gears and fishing methods compliant with the regulation in force. They are democratically elected for three years, with their terms renewable by the fishermen gathered in a general assembly on the initiative of the local authorities.

Moreover, the Fisheries Department integrated into its plan of continental inland waters management in 1996, among others, the setting up of new fishing committees and the backing up of existing ones. Co-management therefore is a strategy adopted by Benin for the management of its continental inland waters.

External Factors to Co-management Arrangements

Socioeconomic and Political Scenario of Benin up to 1990

Since the end of the colonial era towards the end of the 1980s, Benin was referred to as the “sick child of Africa” – politically, economically and socially.

At the political level, Benin was characterized by a chronic political instability after a series of *coup d'état*. The political arena is dominated by the presence of the military and 18 years of socialism, with Marxist-Leninist ideologies.

During that period, the country had no significant political personality. Influences arising from international politics shaped the domestic political climate, like most developing countries in Africa. It must nevertheless be noted that this instability did not degenerate at any moment into civil war.

At the economic level, an activity which was essentially a legacy of the colonial era was essentially the bringing of raw materials for a variety of domestic industries. The socialist era with nationalization did not resist the requirements of competition and good management. The result is a wave of liquidations of government companies and businesses which went bankrupt, putting many citizens in unemployment with all the corollaries. It was therefore in such an environment of rejuvenating the economy and of social tension that the national conference was organized, aiming at the macroeconomic balance and improvement of sociopolitical framework in the country.

Current Political and Socioeconomic Situation of Benin

The political and legal actions foreseen at the national conference were committed and brought returns. Since 1990, Benin started a process of economic recovery in the context of a new democratic era. This new political and economic framework pursues the following essential objectives:

- The reinforcement of the legality of the State as a sovereign nation by:
 1. Reconstruction of the national economy
 2. Reinstatement of Benin's position at the international level; and
- Reinforcement of national solidarity.

Most of these objectives are already translated into concrete actions such as strengthening mechanisms of a legal state, affirmation of economic liberalism and political alternation.

It is in such a context that the fishing committees and the co-management system as a whole are progressing today. It is hence recognized that external factors are favorable to the proliferation of such a system. Referring to natural phenomena, Lake Nokoue and the lake network of south Benin are yet to experience major calamities caused either by man or nature in spite of isolated floodings which actually encourage the exploitation of fishing holes instead.

Resource Availability

Two related issues seem to challenge the availability of these resources in both the medium and long term. The first issue is decrease in catch. The second issue is that of the fisheries administration, which based on the studies, sees the stagnation or even overexploitation of the resources. When these two elements are put together with the obvious growth of fisher population, it needs to be taken into consideration that serious problems exist in the fishery.

Possible Effect of the Utilization of the Acadja System to Fill the Lake

Studies are currently not available on previous and present depths of the lake. The utilization of *acadja* continues to leave refuse which in the longer term can choke the lake, as in the case on Lake Aheme on the west of Benin.

Interaction among Co-management Partners

Origin and Development of the Co-management Initiative

The co-management experience through the establishment of fishing committees was born in 1993 in the southeast region where serious conflicts were rampant over the utilization of the plan between *acadja* fishermen owners and fishermen with nets on inland waters. Indeed at a certain point, the extension of *acadja* was so prevalent that authorities did not permit any more such activity to fishermen. Sometimes, incidents of violence are common in the fishing place. Such situations lead to the finding of another form of more efficient management. That is how the idea of fishing committees as a structure capable of playing this role originated from the National Fisheries Department.

A close analysis shows that four fundamental reasons seem to motivate the creation of the fishing committees. These are as follows:

- Open access created by lack of traditional management,
- Failure of the existing administrative management,
- Existence of many problems over inland waters,
- Necessity of an organizational form involving the fishermen and fisheries' administration in order to solve problems related to fishing.

The initiative of establishing the fishing committee received positive responses from the fishermen. In the course of the survey, out of 61 fishing committee members interviewed, 88.52% attested that the idea of establishing the fishing committee came from fishing agents, and 98.36% affirmed that this structure corresponds to a real need of the fishermen. In order to sustain this assertion, 20 good reasons were given by approximately 60 fishermen (see Appendix 5).

The fishing committee is defined like a communal structure gathering representatives of the fishing occupation as a whole within a locality in order to promote fishing activities. The objective of this committee as defined by the fishermen themselves are presented as follows:

Table 7. Roles devolved to the fishing committee

Roles devolved to CP (Fishing Committee)	Nos.	Rate
No answer	3	5.45
Settle conflicts	19	34.55
Supervising of inland waters	17	30.91
Protect/safeguard fishing resources	23	41.82
Implement regulations	11	20.00
Sensitize fishermen	15	27.27
Suppress bad fishing practices	1	1.82
Serve as an intermediary between fishermen and the Administration	2	3.64
Reorganize the sedentary fisheries	2	3.64

Source: Findings of the study.

As shown in Table 7, the objectives pursued by the fishing committees supercede the interests of one type of fishing as far as fisheries is concerned.

Functioning of the Fishing Committees

Functioning. At the level of every village or group of villages a fishing committee bureau is established, comprising 9 to 15 fishermen (representing all the fishing professions of the locality) democratically-elected during a village assembly organized by decentralized structures in the administrative entity concerned.

Of the bureau members interviewed, 91.8% affirmed having elected persons responsible in the committees through voting. These bureaux which are dynamic elements of the committees meet once or twice every month following the fishing activities. During these meetings, bureau members examine fishing issues and either take legal decisions or define actions to be carried out. During meetings, decisions are taken democratically or collectively according to 98.36% of the respondents. At that level, contact is made with the local agent who is specialized in fishing for purposes of training the locality, need of opinion or merely to inform pertinent developments.

Following that, decisions are made known to the committee at the village level for a discussion about a final and mutual decision to be taken. When the decision is enforced, the local authorities, such as village chiefs and mayors in the local administrative structure and the community get together to implement the final task.

Studies on the nine management committees in the sample concludes that most of the committees understood the objectives assigned and carried to a large extent the following activities:

- Exit checking of net meshing,
- Seizure and destruction of mesh gears used by some fishermen,
- Cut off the banks of the lake for the peripheral villages.

The major strength of this system is the fact that all the fishermen are confronted with the problem of resource shortage or at least feel the beginning of a decrease. Moreover, a great number, apart from those who use prohibited gears adhere to the ideals of the fishing committee.

Motivations of the Fishermen in Order to be Engaged in Co-management

In recent years the fisheries situation is characterized by a constant deterioration at all levels:

- Resources of different inland waters show signs of stagnation, even subsidence under demographic pressure,
- Attempts at creating fishermen associations by the fishing profession are found to be inefficient to settle particular issues in the fishing profession and even those of fishing in general,
- Conflicts between fishermen over the utilization of inland waters are intensified,
- The survival of fishermen and future of the next generations seem compromised, and
- Alternative job opportunities seem attractive.

The motivations which brought the fishermen to be grouped together for co-management were found to be as follows:

Table 8. Main motives of grouping the fishermen for co-management

Motives of grouping	Nos.	Rate
Safeguard the resources	146	64.89
Better management of the resources	40	17.78
Protect inland waters	25	11.11
Settle conflicts	19	8.44
Improved living conditions	17	7.56

Increased fishermen's incomes	2	0.89
Conformity to rules	2	0.89
Reorganize activities on the lake	1	0.44

Source: Findings of the survey.

There were suggestions from the administration to create a structure within the fishermen community and which will favor their gathering for co-management of the resources. So, the real motive of the fishermen for being engaged in co-management is to ensure their livelihood whilst safeguarding resource sustainability for their children.

Motivation of Government Agencies to be Involved in Co-management

Like the fishermen, government agencies have their own reasons to adhere to the co-management system, which essentially aims at sharing responsibilities.

At their level, two main reasons seem to motivate their adherence; i.e., the achievement of the mission conveyed to them by the state (which is to promote the fishing sector) and put animal protein at the disposal of the population.

Authorized measures are managed unilaterally with limited application. The fishing police organized by the administration found little success apart from quelling the occasional rebellion by the fishermen. The mission of the Fisheries Department was somehow compromised by the failure to carry out actions in order to enforce the regulations as well as settling conflicts among the fishermen. The consequence of this situation is the nonavailability of fishing products in sufficient quantity and hence diminishes the level of animal protein for the population.

That is why the Benin Fisheries Administration suggested that from then on, fishermen were to share responsibility for managing the fishing resources, being aware of the failure of its lone management system. Such a concept supposes a total implication and at all levels for partners. These include among others, a globally-acceptable definition of the orientation to be given to the sector, working out of legal measures and definition of the mode of implementation. In order to show its political will by working in that sense after three years (1993-1996) of experience with the new approach, Benin adopted the co-management system as a management strategy of fishing committees and decided the extension of fishing committees on the inland waters within south Benin. The plan of management which worked out in 1996 gave privilege to the setting up of institutional mechanisms of participatory management, i.e., co-management.

It was clearly stipulated in the current management plan that: "The aims of participatory management mechanisms of inland waters remain the necessity and will of fisheries administration associated directly with fishermen committees to natural resources management."

Moreover, fishing committees were endowed with a legal framework which certifies and legitimizes their actions. Today, fishing committees that form the basis of fisheries co-management arrangements are characterized by the following properties:

- Gathering of professional interest,
- Members are democratically-elected,
- They are entirely made up of fishermen, and
- They enjoy both a social and legal legitimacy.

Communication between Different Partners

Communication between co-management partners should be considered at several levels. Between external institutions, the relationships are functional and communicable. These relationships become functional only in the case of issues which need the expertise of others. Between external donor institutions and the fishermen, the communication system takes several forms, i.e., meetings, minutes of meetings and letters etc.

Between fishing committees and external institutions the relationships are both vertical (village committee to subprefectural committee and fishing council at regional level) and horizontal (between the same organization level with full knowledge of the facts). However, whatever the level of organization, a structured and formalized communication system is yet to exist between the co-management partners.

Settling of Conflicts between Co-management Partners

The settling of conflicts does not involve conflicts between all partners involved in the co-management process. Conflict resolution is often only at the level of fishermen. To this level, mechanisms of resolution used are of two kinds. The first is the amicable settling of conflicts before local administrative authorities, fishing committees, eminent personalities and religious representatives. This mechanism is the most used and which originated from African traditional values which give privilege to reconciliation through the family and village councils. The second mechanism used is the recourse to council forces constituted by the State police force or other legal instruments such as the courts-of-law. Recourse to the second mechanism of conflict resolution is rather less used, representing under 10% of cases. With the creation of fishing committees in the villages, the responsibility of conflict resolution related to fishing passes through territorial administrative authorities, chiefs of villages and major subprefects to fishing committees at varying levels.

Efficiency of the Co-management Arrangements

After six years of responsibilities shared between fishermen and the fishing administration, the appreciation of this kind of management is generally good. This appreciation is often made on a profit basis that one can gain not in terms of output for the time and effort invested, but improvement of situation with regard to previous fishing committees. Indeed at this stage, system evaluation initiatives are difficult to appreciate, likewise to quantify time and effort devoted to co-management initiatives.

Appreciation and Assessment of the Efficiency of Co-management by Fishermen

With regard to numerous issues in which fishermen were faced with and those that constitute the motive of adoption of the co-management idea, the six years of co-management experience has brought potential solutions at all levels.

Table 9. Positive actions of the Fishing Committees (CP)

Positive actions of CP	Nos.	Rate
Less conflicts on inland waters	11	20.37
Sensitization of fishermen on prohibited gears	9	16.67
Repression on inland waters	4	7.41
Increase in catches	12	22.22
Improvement of fishermen conditions	2	3.70
Respect for the rule-of-law	8	14.81
Mangrove plantation	3	5.56
Conflict resolution	14	25.93
Reorganization of sedentary fisheries	3	5.56
Honoring of vows	13	24.07
Freedom for women to sell their products	1	1.85

Source: Findings of the study.

As shown in Table 9 and in Appendix 6, co-management started to have real impact on the lives of fishermen and on the fishing activities as a result of commitments from fishing activities. In terms of common management, a number of responsibilities are granted to the fishermen such as the following:

- Fisheries development,
- Settling of conflicts related to fishing,
- Proposition of legal rules, and
- Collaboration on the working out of laws and regulations.

The appreciation of fundamental aspects of this co-management arrangement seems to augur a promising future for further improvement.

Table 10. Improvement brought by Fishing Committees

Elements	Nos.	Rate
Conflicts settling	261	96.67
Involvement of fishermen in implementing laws	257	95.19
Knowledge of laws and regulations	243	90.00
Execution of fishing-related decisions	239	88.25
Protection of resources	265	98.15

Source: Finding of the study

Appreciations given here by 270 fishermen, comprising both fishing committee members and representatives of all fishing professions on Lake Nokoue seem highly optimistic. Moreover, these rates don't hide the effort to be expressed by those who have an opinion contrary to those mentioned in the table. For example, 8.89% of people who think that fishing committees didn't improve are challenged by the laws and rules, citing the following reasons: lack of information dissemination initiatives at fishers' disposal, illiteracy of the majority of fishermen and a lack of sensitization efforts by government agencies. The optimism of fishermen on the efficiency of the fishing committees seems to relate to the past where improvements were scarce. Without assessing the real effort and time, it is obvious that unpaid service jobs for the committee bureau members and time devoted to the monitoring and surveillance of other fishermen constitute a loss of earnings which has no compensation at the time of writing.

Appreciation and Efficiency Assessment of Co-management by the Fisheries Administration

Considering the numerous issues on inland waters and the reasons that led the fisheries administration to initiate the setting up of fishing committees, improvements and the progress point towards efficiency from the result achieved, which constitute the following:

- Existence of efficient channels to reach the fishermen at the village, subprefecture and region,
- Reduction of fishing police patrols during fishing,
- Respect for the rules, and
- Existence of a relay for information and decisionmaking concerning the fishermen.

So, as for the fisheries administration, with the co-management experience:

- Fishermen have good comprehension and willingness of their roles,
- Fishermen are ready to cooperate with Fisheries Department in its effort to promote the sector,
- Fishermen understand the necessity of being compliant to the rules, and
- Fishermen still constitute an "opposition" before the Department Fisheries.

On the other hand, Government resources devoted to co-management come from the following:

- Technical support brought by the government agents for the setting up, training and follow-up of the fishing committees, and
- Financial support for training, monitoring and publication of fishing committee materials.

Out of 93 established fishing committees, 55 (or 59%) are already equipped with dugouts, boots and other materials of work, with arrangements made to pursue such efforts. Compared to expanded efforts, government agencies seem to have been compensated by the reduction of fishing police patrols, information and sensitization campaigns and actions for which fishing committees constitute from now on.

Equity Effects of Co-management Arrangements

Though the idea of establishing fishing committees is an initiative of the Fisheries Department, it was favorably welcomed by the majority of fishermen. In the same way, two parties share in common a great part of assigned objectives to one another. However, the underlying question centers itself on the issues of equity such as the sharing of profits drawn from the target groups.

Target Groups by Co-management Arrangements within the Communities

The legal arrangements of co-management are as stipulated in Article 2: “*The fishing committee is made of fishermen representatives and users of gears and fishing methods compliant with the regulation in force.*” In that point of view the number of fishermen who use prohibited gears are excluded from the co-management process. Pursuant to fisher assessment, this category forms an average of 20-30% of fishermen. The conflict involving the Fisheries Department was unfortunately intensified by the fishing committees. Persuasive means were utilized to get the fishermen to cease their fraudulent activities.

Women. In conceiving this structure, initiators of the fishing committees excluded women who were perceived as secondary users of the lake after the fishermen. For them, fishing committees and co-management are considered as “men’s business” only. This concept of the perceived co-management actors is also found at the transfer level of fishermen who themselves have minimized the role of women in fishing committees (Appendix No. 7).

Answers mentioned on the list however indicate that fishers comprehend not only the role of women in fishing committees, but also that of the committee itself for enforcement purposes. Though effort had been made to involve women in recently-established committees, the number of women is still small in the fishing committees. Out of 9 fishing committees, a single female member represents women in two of them, or 22% of the committees proportionately having one woman member among them. Apart from women, other main users include carriers of *acadja* branches, passersby, dugout builders and other fishing materials also excluded from the co-management system.

Co-management Profit-sharing within the Communities

The co-management arrangement and involvement of players for the process, indicates little equity. There are yet notable positive impacts resulting from the fishing activities. Out of 270 people interviewed (fishing committee members, nonmembers and fishermen using prohibited gears) at the time of the investigations, 68.52% favor action carried out by the fishing committees whereas 70% accepted results obtained from those very committees. The remaining 30% is not in favor because it feels that these actions are against their interests. However, it is the fisher committees which gain advantage from these results by the reduction of conflicts, proper organization of sedentary fisheries and collaboration between villages.

Interestingly, even after six years of practising co-management, the feeling of injustice and dishonesty persists in about 30% of fishermen interviewed.

Sharing of Rights and Responsibilities between the State and the Communities

The political will of the fishing administration in being committed to the co-management process is to adopt them as a development strategy, establish them on the lagoon and lake of south Benin and in endowing them with legal basis. But today, there lies the problem of the definition of the real sharing of responsibilities between

the State and the communities. Despite the fact that 95.19% of communities affirm the implications on legal policies, most of the powers are still retained by the fisheries administration.

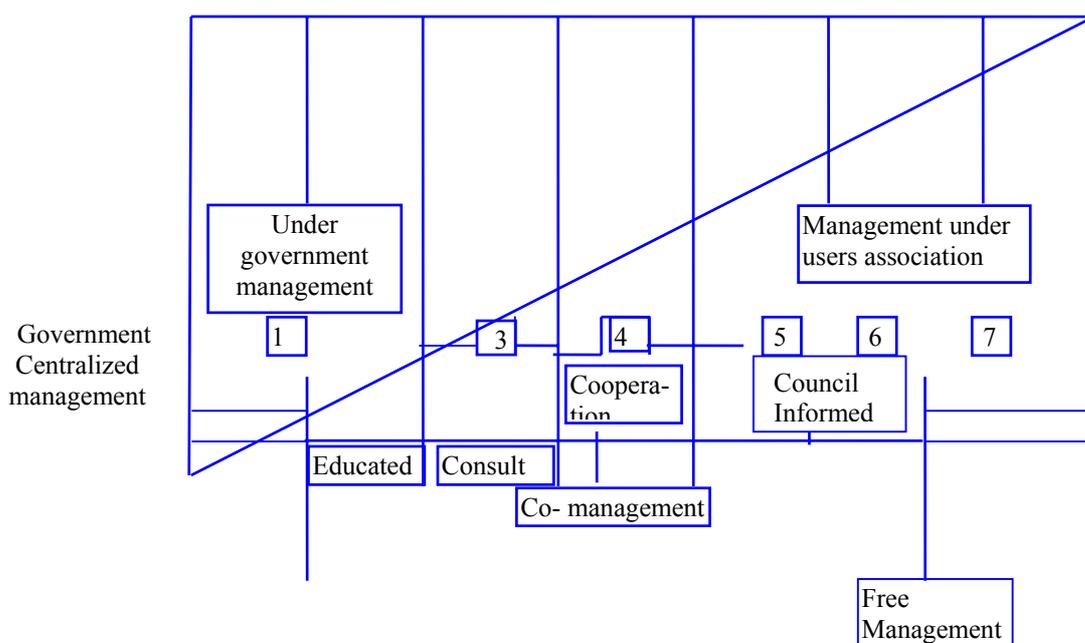


Fig. 3. Spectre of the co-management arrangements

As far as the spectre of co-management arrangements are concerned, the process changed from centralized management through government agencies to a consultation management style, even of cooperation with the communities.

Durability of the Co-management Arrangements

According to the results of the follow-up system of the fishing committees put in place by the fishing administration, 80% of fishing committees were found to function well. This rate is almost confirmed by the fishermen interviewed during the study and for which 75.56% of fishing committees work well. For only six years of experience the performance looks reasonably appreciable. However, it is the bad functioning of fishing committees that one should look for real obstacles to the co-management process.

Table 11. Bad causes of fishing committees functioning

Elements	Nos.	Rate
No conflicts with users of prohibited gears	2	3.28
Poor communication between the CP and <i>medokpokonou</i> fishers	2	3.28
The CP (fishing committee) are not rigorous with law	2	3.28
CP don't organize the village General Assembly	1	1.64
Even CP bureau members use prohibited gears	2	3.28
Nonexistence of funds	34	55.74

Lack of cohesion/divergent interests	4	6.56
Bad communication and lack of means	5	8.20
Lack of funds and cohesion	9	14.75
TOTAL	61	100.00

Source: Findings of the study.

As we can see in Table 11, 55.74% of those who mentioned bad functioning of the fishing committees think that the causes are due to a lack of means notably working materials: dugout canoes, boots, raincoats, torches and sound gears. Here, the needs mentioned for the good functioning of the fishing committees show very well the priority of the role of the fishing police granted to the fishing committees. As far as the fishing committees are concerned, 40.74% of people interviewed perceive that their good functioning depends on outside factors, notably the Fisheries Department and Centers of Regional Action for Farming Development (CARDER).

Fishing Committee

In spite of the problems which the fishing committees are confronted with in the system of co-management in general, fishing committees are endowed with opportunities which can constitute a guarantee of the system durability are as follows:

- Fishing committees are a real need for the fishermen and the fisheries administration.
- Participation of a great number of fishermen and nonfishermen to sensitization meetings, monitoring of mesh operations organized by fishing committees is important.
- Actions of the committees already contribute to the resolution of certain issues on fishing.

Conclusion

After the decline of the traditional system of fisheries management, co-management is presented today in Benin like a solution much awaited. Though the co-management initiative originated from the fishing administration it was adopted by about 80% of fishermen of Lake Nokoué because the fishing committees and community structures which establish co-management correspond to a real need of fishermen to defend the common interests of all. The political will of the departments in charge of promoting the fishing sector to share its management responsibilities following a solitary management since 1993 is tantamount to: adoption of co-management as a development strategy of continental inland waters in Benin, involvement of the fishing committees on all the rivers, lakes and lagoons of south Benin, and the establishment of a legal environment which renders the fishing committees both official and legal.

The established co-management arrangements which is endowed with a legal status is dominated by freedom of speech and organization and had started yielding results after six years of experience, notably: in resolving conflicts between fishermen, organization of sedentary fisheries, mesh monitoring and reforesting the lake bank with mangrove swamps. Since co-management is defined as the sharing of responsibilities, we should redefine and grant one another the responsibilities which are theirs so as to help the fishing committees evolve from merely state consultative structures to partners in the decision-making process. At the level of the fisher communities, it is necessary to revise the process of co-management to allow a greater number of actors to play a role, notably the women. Therefore, fisher adherence which implies durability should reach everybody through persuasive means rather than coercion.

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APPENDIX 1

Material cost and fishing technologies

	FCFA (Benin currency)
Wedge-mesh net	35 000
Trailing net	75 000
Cast-net	20 000
<i>Acadja</i> net	80 000
Fishhoop net	500
Shrimping net	6 000
Fishing hole (200 m2)	60 000
<i>Acadja</i> (1 ha)	350 000
<i>Acadja</i> (= 1 ha)	600 000
<i>Acadja</i> (1 ha)	1 200 000
Monoxyde dugout	70 000
Big net (250 hooks)	25 000

Note: US\$1 = 580 Fcfa

APPENDIX 2

Table 12. Age of the fishing gears

Type of fishing materials	Age of the materials							
	Recent (0 to 5 years)		Medium (6 to 10 years)		Old (more than 10 years)		Age unspecified	
	Total Number of gears	%	Total Number of gears	%	Total Number of gears	%	Total number of gears	%
Dugout	169	42.04	170	42.29	60	14.93	3	.75
Big net	13 383	80.06	9	.05	20	12	3 305	19.77
Sleeping net	1 296	70.28	150	8.13	142	7.70	256	13.88
Hoop net	7 729	82.79	320	3.43	150	1.61	1 137	12.18
Cast net	187	56.33	80	24.10	33	9.94	32	9.64
Fishing line	365	73.89	6	1.21	.	.	123	24.90
Small <i>acadja</i>	24	53.33	5	11.11	5	11.11	11	24.44
Medium <i>acadja</i>	9	21.95	9	21.95	17	41.46	6	14.63
Big <i>acadja</i>	27	50.00	7	12.96	17	31.48	3	5.56
Trailing net	115	68.86	4	2.40	.	.	48	28.74
<i>Acadja</i> net	25	12.76	121	61.73	50	25.51	.	.
Hurdles	134	100.00	.	.	.	.	.	.
Enclosure net	.	.	.	.	1	100.00	.	.
Fishing hole	3	15.00	14	70.00	3	15.00	.	.
Shrimpinghoop net	205	60.12	1	.29	.	.	135	39.59
Fish net	2	100.00	.	.	.	.	.	.
Total	23 673	78.58	896	2.97	498	1.65	5 059	16.79

APPENDIX 3

Table 13. Why will you continue to fish?

Reason	Number	%
No answer	9	4.92
Because it provides us income and food	37	20.22
It gives me more 'luck' to better gain my life	4	2.19
It is already a habit	10	5.46
It is my job and source of revenue	40	21.86
More profitable than agriculture	3	1.63
Fishing is an unfailing resource	10	5.46
Fishing is profitable	21	11.48
I'm born in fishing and I only practice it	16	8.74
It gives me more rest	1	0.55
Less difficulties in fishing than in agriculture	1	0.55
Supply of complementary income	1	0.55
Fishing is my passion	15	8.20
It is my parent's heritage	8	4.37
Lack of land suitable for cultivation	1	0.55
Fishing is already a habit and we live on it	1	0.55
It is our job and it is more profitable than agriculture	1	0.55
TOTAL	179	100.00

Note: Lines 3, 5 and 8 are redundant, lines 16 and 17 likewise.

Table 14. Why will you not continue to fish?

Reason	Number	%
No answer	1	1.16
Because it provides us with income and food	1	1.16
More income than fishing	5	5.81
Low output when there is flood	3	3.49
Fishing is less profitable	42	48.84
Fishing does not allow full open out [VAGUE]	6	6.98
Nonapplication of the texts [VAGUE]	4	4.65
One spends too much energy in fishing	5	5.81
Increase in the number of the fishermen	5	5.86
TOTAL	65	100.00

APPENDIX 4

Table 15. Size of fisher households

Size of Households	Number	%
1	6	2.22
2	10	3.70
3	11	4.07
4	15	5.56
5	18	6.67
6	22	8.15
7	17	6.30
8	27	10.00
9	22	8.15
10	12	4.44
11	17	6.30
12	13	4.81
13	19	7.04
14	11	4.07
15	5	1.85
16	7	2.59
17	5	1.85
18	4	1.48
19	6	2.22
20	1	0.37
21	5	1.85
22	4	1.48
23	2	0.74
24	1	0.37
25	3	1.11
26	1	0.37
27	3	1.11
28	1	0.37
32	1	0.37
54	1	0.37
TOTAL	270	100.00

Table 16. Number of respondents' wives

Type	Number	%
Monogamous	156	58.21
Bigamous	71	26.49
Trigamous	26	9.70
Polygamous (4 wives)	7	2.61
TOTAL	268	100.00

APPENDIX 5

Table 17. Why the fishing committee relates to the fishers' real needs

Reason	Number	%
No answer	5	8.33
CP contributes to the surveillance of inland water	4	6.67
Need of a rational management structure	3	5.00
This will give us our subsistence in the future	1	1.67
The State wants to save the fishermen	3	5.00
CP brings changes	2	3.33
Need to make people comply	5	8.33
Use of resources for too long	4	6.67
Fishermen are confronted with the problems of inland water management	5	8.33
Allow proper surveillance of the inland waters	4	6.67
This will help us solve conflicts	9	15.00
Need of a structure which represents the Government	6	10
Surveillance and need to comply	1	1.67
Lack of resources and need of management structure	1	1.67
Follow the rule of law and keep resources as long as possible	1	1.67
Problem of management and the need of a management structure	1	1.67
Surveillance and fight against destroying gears	1	1.67
Surveillance and the need of a regulation structure	1	1.67
Follow the rules and law and settlement of the conflicts	2	1.67
Perpetuate resource availability and settle conflicts	1	1.67
TOTAL	60	100.00

Note: Lines 7, 13, 15 and 19 are redundant.

APPENDIX 6

Table 18. Other improvements brought to the community

Other improvements	Number	%
The CP forbids some harmful practices	10	5.05
Fishermen are afraid of using prohibited gears	4	2.02
Follow the rule of law	16	8.08
Increase resources	28	14.14
Peace on the lake / No conflicts	38	19.19
Fishermen are more informed today	9	4.55
For bidding of the use of prohibited gears	13	6.57
Increase fishermen awareness	6	3.03
Reciprocal respect between fishermen	5	2.52
Fishermen are sensitized in order to change mentality	10	5.05
Plantation of mangroves	22	11.11
Reorganization of sedentary fishermen	23	11.62
The CP is the spokesman of the fishermen, the administration and external people	2	1.01
Opening of navigational channels	54	27.27
Surveillance of inland waters during floods	5	2.53
Fish breeding promotion through improved fishing holes	1	0.51
Many changes were brought [UNCLEAR]	2	1.01
Periodical consultation of CP from different villages	4	2.02
Collaboration with fishermen from other villages	1	0.51

APPENDIX 7

Table 19. Role of women within the fishing committee

Role of women within the fishing committee (CP)	Number	%
No answer	1	1.79
Sensitization of other women on buying small fry	53	94.64
Reception of the foreigners	1	1.79
Serve like an intermediary between wholesale fish merchants and the CP	1	1.79
Defend the interests of the wholesale fish merchants	1	1.79

Table 20. Why women are not CP members

Role of women within the CP	Number	%
No answer	26	12.38
Poor perception of women's role and the objectives of the committee	2	0.95
Lack of information over women representation	49	23.33
Women are not fishermen	3	1.43
Women cannot go on the lake for surveillance	3	1.43
Women refuse to meet with men	2	0.95
Women are afraid of carrying out repression actions	6	2.86
Women are often afraid of taking decision	1	0.48
Women were not chosen /invited /associated	30	14.29
Women are afraid	4	1.90
I don't know	17	8.10
Women were not sensitized	15	7.14
Women are afraid of doing men's job	6	2.86
Women don't keep secret	3	1.43
Women are not allowed to go out in the night	9	4.29
Women are busy with the household	3	1.43
Women have to avoid suspicion from the husbands	4	1.90
I don't know which role can women play in the CP	2	0.95
We don't find how useful are women in the CP	12	5.71
Women don't fish	5	2.38
Women will soon take part in fishing	1	0.48
It is up to the state to decide	3	1.43
Women lack information and vigilance	1	0.48
Lack of information and impossibility of going on the lake	1	0.48
Lack of information and refusal of being met with men	1	0.48
Lack of information and fear of carrying out repression	1	0.48
	210	100

Note: Lines 4 and 21 are redundant, lines 11 and 20 are redundant, lines 25, 26 and 27 are semi-redundant.