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Imperatives of the governance of marine protected areas in West Africa

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## **Abstract**

Marine and coastal protected areas in West Africa (MCPA) are currently paying witness to the emerging phenomenon of an alarming economic extraversion. Nearly 80% of fish catches are intended for the European, African or metropolitan domestic markets. Capture activities are increasingly damaging to marine ecosystems, while only a small share of the economic benefit returns to local populations. The result is a degradation of the natural, social and economic environment. Presenting conservation, well being and re-connection imperatives are part of a new way of looking at MCPA governance that breaks away from conventional approaches

**Keywords:** CMPA, Conservation, Development, Ethics, Fishery, Governance, MPA, West Africa

## Introduction

West Africa has three large marine and coastal protected areas<sup>1</sup> (MCPA): the National park of the Banc d'Arguin (hereafter mentioned as Banc d'Arguin) in Mauritania; the Reserve of Biosphere of the Saloum Delta (Saloum Delta) in Senegal; and the Reserve of Biosphere of the Bolama Bijagos Archipelago (Bijagos) in Guinea Bissau (see figure 1). Registered on the World Heritage within the UNESCO programme, "Man and Biosphere" (MAB), two of the areas (Banc d'Arguin and Saloum Delta), are also recognised as wetlands of international importance (Ramsar sites). As opposed to many European or North-American protected areas, these CMPAs have, since their creation, been sheltering local populations, whose exploitative activities of the resources/spaces<sup>2</sup> (RS) have gradually deteriorated the marine and terrestrial ecosystems.

Initially created in order to protect the marine and terrestrial biodiversity as well as the avifauna, these three MCPA saw day after day the emergence and growth of activities with a commercial aim, to the detriment of traditional and subsistence activities. The regulation in place was never able to contain the increase of the anthropic pressure on natural resources. Therefore, one sees today a significant degradation of forests, mangroves and marine habitats. The increasing pressure of the international market on the activities of the MCPA resident populations can be described as the first explanatory factor in the rupture of the balance between man and nature. The second explanatory factor consists of the absence or the inadequate implementation of the governance process in the MCPA. The protected zones are still managed in the same way as natural areas, dedicated only to the conservation of emblematic resources (marine mammals or birds). Until now, economic processes, in

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<sup>1</sup> These protected areas are located both on land and on sea, which explains their characterisation as marine and coastal protected areas.

<sup>2</sup> The notion of resources/spaces relates first of all to the combination of a space with renewable, natural elements characterised as resources. The resources/spaces can then be defined as some asset enabling the development of the social group and the constitution of its cultural identity. The concept of resources/space, developed by O. Barrière (2000) integrates notions of both nature and society.

particular the natural resources based commercial activities and trade, have not received much attention from the authorities. They have therefore not been included within the existing management schemes and are today endangering the existence itself of the MCPA. The objective of this paper is to present the need for the implementation of a governance process for the West African MCPA, with the knowledge that the West African experience can be useful in other contexts and under other latitudes.

This paper, structured in three parts, focuses on marine activities because of their strong exposure to the pressures of international markets. The first part describes the “tank” effect of the MCPA, the increasing trade in marine resources and the evolution of fish catches (in volume and value terms). It also shows the spatial dynamics of marine resource exploitation, as well as discussing the influence zones of resident population. The second presents the trade and distribution channels for seafood products by first underlining the way in which the MCPA are more and more put under pressure to satisfy an exogenous market demand, and then by presenting the prevalence of immigrant operators in the value chain. The third part, proposes three imperatives of governance, namely conservation, wellbeing and reconnection, intended to be used as a base for the implementation of West African MCPA governance.

## Figure 1

### 1. “Tank” effect of the MCPA and the increasing trade of marine resources

The scale of exploitation of marine resources varies from one MCPA to the other according to environmental or cultural factors (see table 1 for an overview). Within the Banc d’Arguin climate, aridity prevents the development of agricultural activities which leaves fishing as the main occupation, even more so as the presence of a permanent up-welling favours the development of the aquatic fauna. In the Saloum

delta and the Bijagos, agricultural and forestry activities dominate, with fishing representing the principal activity only for the share of the resident and allochtoon population living within the coastal zone. Cultural factors also limit the development of marine activities in the Bijagos archipelago. The rituals and beliefs of the resident population, the Bijagos people, are firmly linked with the Earth and its sacred forests, which is where many of their villages are located, deep inland on the islands (Agardy, T., 1991). They turn their back to the sea and to fishing activities that would require them to leave the forest behind.

### **1.1. The quest for high value species**

Fish captures of the three MCPA represent approximately 43.000 t annually. This figure includes those which are the object of official declaration (28.000 t) and those which were not recorded and carried out in an illegal way (15.000 t). The illegal exploitation of the resources in the MCPA of Mauritania and Guinea Bissau, is primarily carried out by artisanal fishermen who target species with high commercial value, bound for the European markets. In Nouakchott (Mauritania), the majority of demersal species entering the export market comes from the zone of the Banc d'Arguin as it is one of the rare areas of the Mauritanian economic exclusive zone (EEZ) where large fish are still encountered. In Guinea Bissau, Senegalese fishermen fish in trips ranging from 10 to 15 days to the archipelago of Bijagos and do not declare their captures, which are unloaded in Casamance or in Dakar (Senegal), with most of the catch aimed for the European market. In Senegal, the demersal resource being practically exhausted, illegal fishing is much less developed.

#### **TABLE 1 here**

Fish catches have gradually been increasing over the past 20 years in the Banc d'Arguin and in the Bijagos, where fish stocks are considered to be in a fairly good state (Failler P. et al, 2004), (Diop M. et al, 2004). Within the Saloum Delta, stocks

are fully if not over exploited. As a consequence, there has been a levelling in the captures of some species (small pelagic), but a strong decline in other species with higher commercial value (demersal species) (Barry M.D., Laurens M., Thiao D. and Gascuel D., 2002; Deme M. et Thiam D., 2001) Figure 2, presents in a schematic way the evolution of catches in volume and value terms since the 1970's (all species aggregated).

#### **FIGURE 2 here**

The trend in value of captures in the Bijagos and Banc d'Arguin increases more strongly than the trend in quantities meaning first that both quantities and price increase and second that price levels increase faster than quantities. In the Saloum Delta, values and quantities of the captures decrease and furthermore the slope in value terms is steeper than the curve of the quantities, meaning that price levels are decreasing. The increasing share of demersal fish (species of strong commercial value) in landings of the Bijagos and the Banc d'Arguin regions, and the increasing predominance of small pelagic (species with low commercial value) in the Saloum Delta are the main causes behind these trends. The orientation of the production towards species with strong commercial value in the MCPAs of Mauritania and Guinea Bissau attest to the shift in fishing practices from subsistence activities towards commercial ones with a focus on high monetary values. It also emphasises the "tank" effect of these two MCPAs, vis-à-vis the collapse of demersal fish stocks in the West African maritime zones (Chavance and al, 2005) and highlights their importance in the process of continuous growth of West African fisheries as shown by Pavé and Charles-Dominique (1999). The former modes of subsistence production, based on the exploitation of pelagic species migrating along the coasts, are thus gradually being replaced by commercial systems, with the support of both local populations and outside traders.

### **1.2. From the shore to the open sea: out of control fisheries**

Subsistence fishing activities are carried out in the coastal zone close to the shore and in the channels of the mangroves forests (bolongs), while commercial exploitation of resources happens mostly offshore. . Mollusc collection and subsistence fishing in the Bijagos archipelago keep women on the shores and within the mangroves forests while fishermen rarely sail more than a few hundred meters from the shore. Fishermen on the Banc d'Arguin, the Imraguen people, set their "shoulder nets" from the shore for their subsistence, but set off with their "lanches" (wooden framed Latin rigged sailing boats) for a daily fishing trip in search for fish to be traded. The following figure presents the major activities performed within the three MCPAs by the resident population as well as the ones carried out by foreign operators.

**FIGURE 3 Here**

In both the Banc d'Arguin and the Bijagos, the totality of the trade value of the marine resources is taken from the coastal zone. In the Saloum Delta, value creation is happening out of the park boundaries. Saloum resident fishermen are forced to move out of the Delta for commercial fishing activities. They are found all over the Senegalese coast, in Mauritania (Banc d'Arguin among other places), in Gambia and in Guinea Bissau (in the Bijagos archipelago among others). Generally speaking, activities of foreign fishermen and more specifically Senegalese in the Mauritanian and Bissau Guinean MCPA are usually of an illegal nature. In the Banc d'Arguin, while resident fishermen are the only ones authorised to fish, Senegalese or Mauritanian fishermen operating on the fringes of the Park often fish within its waters. In the Bijagos, the license logbooks show that only a few fishermen pay for the right to fish. The reserve at the Saloum Delta does not appear to be attractive to foreign fishermen, a situation completely different from the Bijagos and the Banc d'Arguin that act as marine resource reservoirs or "tanks" attracting fishermen away from the degraded state of the neighbouring ecosystems.

Figure 3 also shows the maritime areas where the population exerts some influence or control. With state operated surveillance systems often being unable to efficiently prevent illegal fishing activities, the local population is increasingly being asked to get involved in monitoring the maritime zones. Still, it appears that the resident population is unable to exert any control on the maritime zones, where illegal fishermen operate. It is indeed impossible for Imraguen and Bijagos fishermen to intervene on the high seas due to the fact that their boats are un-decked and un-motorised (Canarian type “lanches” and monoxyl pirogues) and their knowledge of the distant waters is limited. Furthermore, even if some of the fishing zones overlap, foreign fishermen tend to enter Banc d’Arguin Park boundaries mostly at night (they would sometimes also enter during the day ,but would then keep close to the park boundaries) while Imraguen mostly go out for daily diurnal trips in the channels relatively close to the shore.

## **2. Seafood trade and the increased opening-up of the MCPA**

### **2.1. MCPA as suppliers to outside markets**

The combined effect of the reduction of catches of demersal fish in European waters and the increase in fish consumption per capita, has induced a significant rise in the European imports of seafood products of high commercial value (demersal fish, shrimps, cephalopods) from African countries (Failler P. et al, 2004) over the two last decades. This has not only lead to an important increase in the attractiveness of the MCPA, but also in the development of new seafood supply chains. Today, four main fish supply chains can be outlined: demersal fish, pelagic, selacians and molluscs.

#### **FIGURE4**

The growing demersal chain focuses primarily on the species known as "noble". They are marketed fresh and bound for the European markets (French, Spanish and



Italian essentially). Traditional chains of small pelagic fish supply the neighbouring coastal countries (Guinea, Sierra Leone and Liberia), landlocked countries (Mali and Niger), as well as populations of the MCPA with dried, salted or smoked fish. The selacians chain (sharks and rays) is divided into two branches: one of carcasses, which supplies West African markets (Mali, Senegal, Ghana and Guinea); and one of fins, bound for Asian markets and shipped from the Gambia (Diop, Mr. and Ould Cheibani M.M., 2000). The chain of selacians shows the same characteristics as the demersal one in the way that their importance is due to the value generated rather than to the quantities traded. This chain is in decline however, because of the disappearance of sharks and rays in the Banc d'Arguin and Bijagos due to overexploitation. Lastly, the chain of molluscs, which is very short as it is mostly relied upon for subsistence, has a great importance because it compensates for an animal protein deficient diet (especially in the Saloum Delta and the Bijagos). On the whole, the chains supplying national African and international markets (European and Asian) represent 28.500 t (80% of the production).

## **2.2. A structural and structuring grip of allochtoon operators**

The following presentation aims to show the submission of the MCPA to the outside world, a submission resulting from the interference of national, regional and international markets. Four distribution channels have been identified (see table 2) according to the MCPA and to the final product.

**Table 2 here**

An III configuration, corresponding to an auto consumption process, has been identified for the mullet in the Banc d'Arguin, for the ethmalosa and oysters in the Saloum Delta and the shellfish and coastal fish species in the Bijagos. Neglected in the economic evaluation are the exploitation dynamics of the MCPA marine resources (Pomeroy R.S., Parks J.E. and Watson L.M., 2004). Auto-consumption

amounts, according to our observations, to consumption levels per inhabitant and per year, of between 80kg (live weight) in the Banc d'Arguin and the Saloum Delta and 130kg in some of the Bijagos islands, such as Orango, where fish is consumed during all three meals of the day. Auto-consumption is threatened in the Bijagos by the intensification of resource exploitation by foreign fishermen that has, as a consequence, caused a decrease in the coastal resources. Coastal resources are the only reachable ones for the Bijagos fishermen, as they do not use sophisticated fishing techniques (Bijagos mostly use spears, cast nets, traps and small set nets) , nor do they possess engine driven, sea faring boats. Bijagos fishermen therefore see the productivity of their traditional fishing techniques progressively diminishing and this drives some of them, notably those among the older ones, to leave the fisheries sector and turn to agricultural activities or to the exploitation of cashew nuts as reported in many interviews.

Auto consumption is also in decline on the Banc d'Arguin, not because of the lack of fish landed, but because Imraguen fishermen target mostly commercial species at the expense of those favoured for auto consumption, the landings are therefore hijacked by traders at the expense of the population. It has reached such a level that it is increasingly hard to find fresh fish for the evening meal in park villages and so, paradoxically, consumption of Moroccan tinned sardines is increasing each month. Just as damaging is the increasing difficulty encountered by Imraguen women when seeking mullet for the preparation of traditional fish products (Lekhlia, Dhin, Tichtar), as most of the production is sold fresh. Traditional production (represented by a IIE configuration on the graph) is therefore experiencing a steep decline on the Banc d'Arguin.

On the contrary, EEE configurations are booming. They correspond mostly to the exploitation, transformation and commercialisation by allochtoon operators of high value species (legally caught or not), mostly sold as fresh products and, in a more

limited way, to the exploitation by foreign women of oysters in the Saloum Delta and of shellfish in the Bijagos. In between these two opposed configurations (III and EEE) there are a certain number of configurations where tasks are distributed between foreign operators and the resident population. Without going into the details of these various configurations, one needs to remember that all chains of commercial importance finish with E. This implies that the resident population of the three MCPAs do not benefit from these operations as foreign operators control the trade (and often also the transformation process: salted and dried products for example). of commercially important chains. Mixed (IEE) and completely exogenous chains (EEE) are becoming increasingly important due to the know-how of foreign processors, and to the set up of flexible exploitation channels able to adapt rapidly to climate or political changes and supplying reliable markets. The increase in foreign fishing in the Bijagos (the number of foreign fishing camps goes up from 9 in 1991 to 30 in 2000) illustrates the scale of the phenomenon (de Silva A.O., 2002).

Furthermore, examination of the ownership structure of the means of production, transformation and commercialisation reveals that some parts of the chain that bear an I qualification should in fact be considered as E (as indicated between brackets in the table above). Indeed, these are part of the chains that are controlled financially by traders that are considered resident due to their family ties with the resident population, but who have settled with their close families in an urban centre in order to benefit from better living conditions. They take advantage of their lineage and social position to influence the exploitation of marine resources in the MCPA and transform the former social dependency into an economic one (Ould Cheikh, A.W., 2003). For example, traders in the Banc d'Arguin, even if they have family ties with the Imraguen, act as outside operators in not reinvesting the profit earned from the trade in fish products within the Banc d'Arguin; they invest their money in the urban

centres of Nouakchott or Nouadhibou, proving therefore that their involvement in the fish trade with the MCPA is only dictated by financial and individualistic motivations.

### **3. Governance imperatives**

Governance can be defined as the institutional and decisional processes able to reconcile the three objectives of sustainable development, namely: economic growth, social equity and environmental protection. If the term is abundantly used today by public decision makers, the MCPA's administrations as well as the NGOs, its practical implementation is, unfortunately, still lacking. That is explained essentially by the poor analysis of the situation, in particular, of the commercial determinants as well as the lack of experience and competence, which results in the application of ready-made approaches of a mechanistic and simplistic nature. In other words, one speaks about governance but still thinks and acts according to the general principles of single species management. The increasing vulnerability of local populations and the acceleration of environmental degradation, however, force the elaboration of such a governance mechanism that puts forward the wellbeing of local populations and the conservation of natural resources. To these two imperatives of governance, one must associate a third - the reconnection of the local populations with their surrounding environment. The human presence in the MCPA is consubstantial with healthy ecosystems. Current attempts from populations to emancipate themselves from nature degrade the ties between the populations and their natural environment, without generating conservation or human wellbeing. Therefore, it is advisable to propose a governance which, considering the urgency of the situation, is based on the imperatives of conservation, wellbeing and reconnection.

#### **3.1. Conservation imperatives**

Conservation imperatives are of three different natures: a change in the way the MCPA and conservation objectives are perceived, a change in conservation

practices, and a necessity to articulate the different knowledge. The change in perception consists in not considering the MCPA as islands of abundance, used to preserve the natural resource of interest, but as “tanks” where economic operators abundantly help themselves. For some MCPAs, the tank is almost already empty (Saloum Delta, except for some stocks with vast reproductive capacity: ethmalosa, shrimps), for others (Banc d’Arguin, Bijagos), the overall situation appears less critical. Still, the disappearance of some vulnerable species such as sharks, skates and costal demersal fish ((Ducrocq M., 1999), (Bernardon M., 1999), (Worms J., 2002), (Deme M., 2004)), represents a clear signal of the risk that threatens these two reservoirs. Conservation objectives must therefore be put under scrutiny and integrate the list of species requiring protection with all of the species of commercial interest.

The change in conservation practices consists in considering the MCPA as resources/spaces that form several ecosystems, whose integrity should come first in the protection agenda, well before the protection of a few emblematic species. However, ecosystem health is still only considered on paper in these three MCPAs. As an example, the recent interest in fishing practices in the Banc d’Arguin happened at the same time as the negative consequences of maritime activities on the bird population were put forward. How indeed can fish eating birds be protected while all fish are being caught in the fishermen’s nets? Development of ecosystem health indicators are therefore a first step towards new conservation practices. Focusing particularly on the changes affecting the species at the basis of ecosystems or on changes in the qualities of the marine and coastal environments, such indicators would have the advantage of being situated well upstream of the classical indicators (number of birds, nesting sites, etc) and therefore unveil changes that would go unnoticed or whose consequences would only be noticed much too late.

Knowledge articulation is a precondition of the implementation of any governance in the MCPA. The analysis of fisheries management in the three MCPAs underlines the inefficiency of the current system, which is based upon an unilateral top-down decision making process: rejection of management measures by the fishermen; an under utilisation of knowledge; a general mutual mistrust (between the administration and the fishermen); transmission of unreliable data; and lastly, a deficient communication. However, effective conservation requires knowledge, and to acquire good knowledge requires the accumulation of knowledge from the different stakeholders, i.e. the knowledge of fishermen, scientists and managers (field managers in particular), by the creation of a “knowledge articulation platform” similar to the co-viability model developed by Le Fur et al (1999). Such a change in the decision making process would enable the start of a co-management process of maritime activities that would be fed by common knowledge and based upon reciprocal trust (Chaboud and Cury, 1999).

### **3.2. Well being imperatives**

Well being imperatives focus on four points: the acknowledgement of trade as a driving force in the life of the MCPA; the control of product flows by the resident population; the implementation of the distributive justice principle; and the creation of a policy aiming at integrating the MCPA into the national landscape. The recognition of trade is of prime importance in the creation of MCPA governance. Indeed, trade acts as a first vector of transformation of economic activities and the population’s way of life. It annihilates all effects of management measures aimed at resource conservation and opens the door to unlimited exploitation. Populations enter the game as labour force, but without realising it, they are killing the goose that lays the golden egg. Worse is the attitude of administrations that perceive trade as a way to bring progress within the MCPA. Still, trade, under its actual shape, mostly acts as a vector of inequality since the terms of exchange are not fair. The deficiencies that

affect maritime productive systems reinforce a situation of institutional hostage where the MCPA producers are reduced to the state of economic “servants” of the outside traders. Trade needs therefore to be assessed in the light of its consequences - that it can be beneficial when it is understood and managed, but disastrous when unleashed without any framework.

The resident population must have control of product flows in order to contribute to their emancipation. The major part of the value generated by maritime activities in the MCPAs benefits outside economic systems. Value addition is mostly realised by trade. Demersal species from the Banc d’Arguin are sold at a price four times higher out of the Park boundaries than within the Imraguen villages; shrimp prices are multiplied by five as soon as the product leaves the Saloum. In short, trade of maritime products does not benefit the resident population. The sale price represents more a compensation of the labour force than a valorisation of the production.

Still, MCPA development cannot happen without the control of the exploitation, value addition and trade of extracted resources. Furthermore, MCPAs cannot let foreign fishermen exploit their resources without any consideration for the local population’s needs or for ecosystem health. It is fundamental then, to find a means of stopping the sidetracking process of the local population within their own resources/spaces. This would enable the population to become economically independent and in turn would transform the MCPA into living places instead of their actual use as working places. The population would get their dignity back; a dignity they say they have lost.

The application of the distributive justice principle is a step forward towards the elaboration of governance. First of all, trade implies a progressive deconstruction of the social structure in the resident population, according to the financial successes of some. The dominance of tribal influence further favours the hijacking of wealth by the elite and reintroduces at the same time an economic and social dependency.

Furthermore, trade under its actual form favours the transfer of wealth from the MCPA towards urban centres located at their periphery. The MCPAs therefore participate in the development of the cities at the expense of the resident population that benefit so little from the trade effects. A governance mechanism of distributive justice that operates a fair redistribution of wealth created within the MCPA must be implemented in order to improve the living conditions of the resident population.

The implementation of an integration policy consists of considering the MCPA as regions or areas, which have the same social needs as any other area of the national territory. The will to shelter ecosystems and in some ways populations from the negative influence of the development process that were happening everywhere has led to the artificial isolation of the MCPA. MCPA administrations, with the complicity of international donors, substituted themselves to the national administration in charge of the social and economic development by implementing their own social programmes. As a consequence, the State took this opportunity to free itself from that burden. Still, the social development differential is growing stronger and stronger between the population living within the three MCPA (especially for the Banc d'Arguin and the Bijagos) and those living outside. Lack of health and education infrastructures within the three MCPA are proof of this differential in social development. Furthermore, the fact that the resident population has developed resource production and valorisation modes similar to those observed outside of the reserves, forces us to consider the MCPA as geographical entities similar to the rural areas or those coastal zones for which land and development planning are devised.

### **3.3. Reconnection imperatives**

Reconnection imperatives mostly deal with the reinforcement of ties between populations and nature. The dissolution of ties between populations and their natural environment will occur while they have the desire to free themselves from their



dependency on nature for the satisfaction of their livelihoods. The introduction of imported goods for domestic use replaces the numerous types of food and tools which used to be produced locally and tricks the population into thinking that they do not need to rely so much on local resources. Worse still is the fact that the local population starts to consider the available resources/space under a trade angle and loose the cultural angle that used to prevail. They used to consider themselves as stakeholders in the resources/spaces in which they lived. The emancipation of the population from nature, which can be considered as a form of an entry point into modernity, carries with it deep social wounds, as the speed of change deconstructs the existing social structure.

It is therefore of prime importance that the population links back with nature and find the Ariane thread that enabled it to satisfy its needs whilst also protecting the environment. The role of the ancients and wise men is of foremost importance in the reconnection process as their persuasive powers are still strong.

The role of women in the development of ties with nature is also to be highlighted. They perceive nature as an entity that renews itself periodically, and to which they are part of by giving birth there and by feeding their children with what they gather in the resources/spaces. Time for women is cyclical, while for men it is linear (Naouri A., 2004). Hence, nature does not start at their birth nor does it end with their death. Man's conception of nature is on the contrary very rectilinear, as man perceives subconsciously his natural environment as beginning with his birth and ending with his death – from there stems a linear behaviour vis-à-vis nature that encourages him to take as much as nature can provide. This shows the importance of including women in the rehabilitation process of damaged resources/spaces as well as in the improvement of living conditions (Williams S.B., Kibongui A.M., Nauen C.E., 2004). Even more so because they can be considered as first losers of the entry of trade within the MCPA; resources/spaces trade activities are the prerogative of men

(Failler P., Deme M., Mendy A., Saine A. and Koroma M., 2005). The most striking example is the one of women from the Banc d'Arguin who, due to the reduced importance of mullet fisheries, have not only lost their economic role (transformation and packing), but also a food and an income source for their households (only partially compensated for by the rise in the income of their husbands, fishermen).

## **Conclusion**

Alienation of the resident population by the dispossession of control over the means of production, the value addition processes and the trade of natural resources (which have been handed over to some elite groups or to outside operators) leads to the characterisation of the MCPA as some sort of place for extraction, just like a mine or an oil field would be considered. The label "MCPA" is only a smokescreen created by the phenomenon of collective blindness and an illusion of controllability; it is instead, a wild exploitation of natural resources that does not fit in any way with the conservation objectives nor with the objective of the population's wellbeing. Taking into account the combination of the three objectives of sustainable development (economic growth, social equity and environmental protection), this translates into the three imperatives of conservation, wellbeing and reconnection. The implementation of these three imperatives is capable of giving some sense and content back to the label MCPA and would form a part of the execution of the Johannesburg Plan of Implementation.

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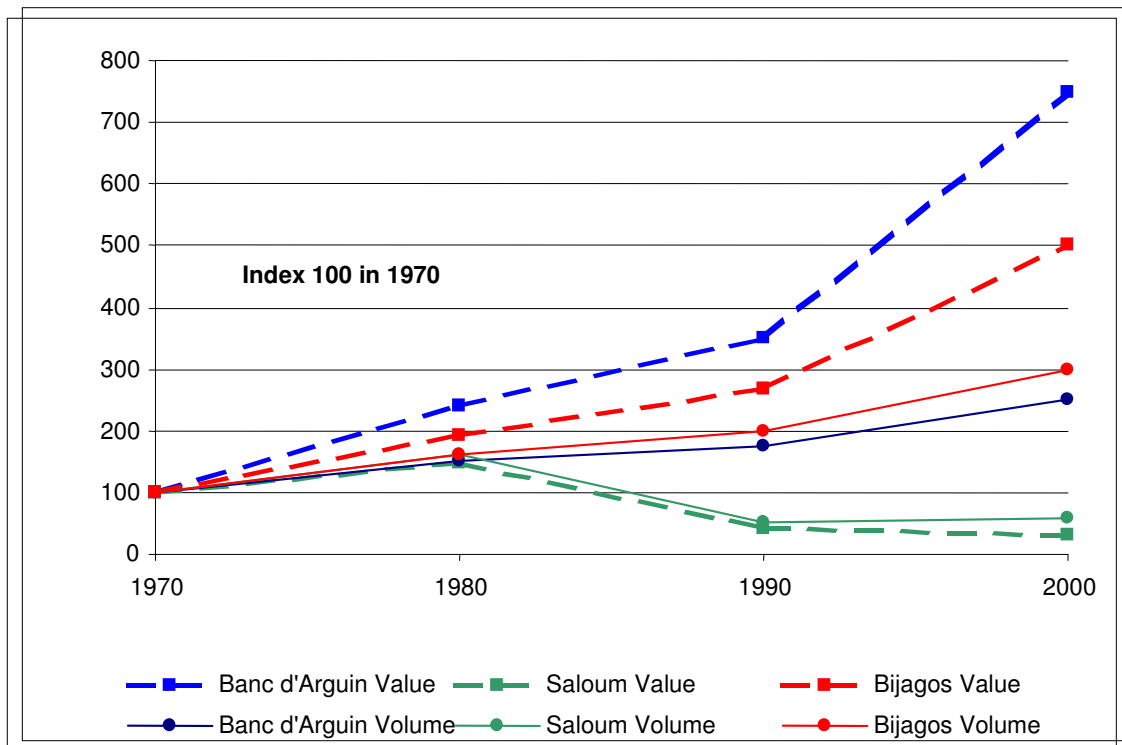
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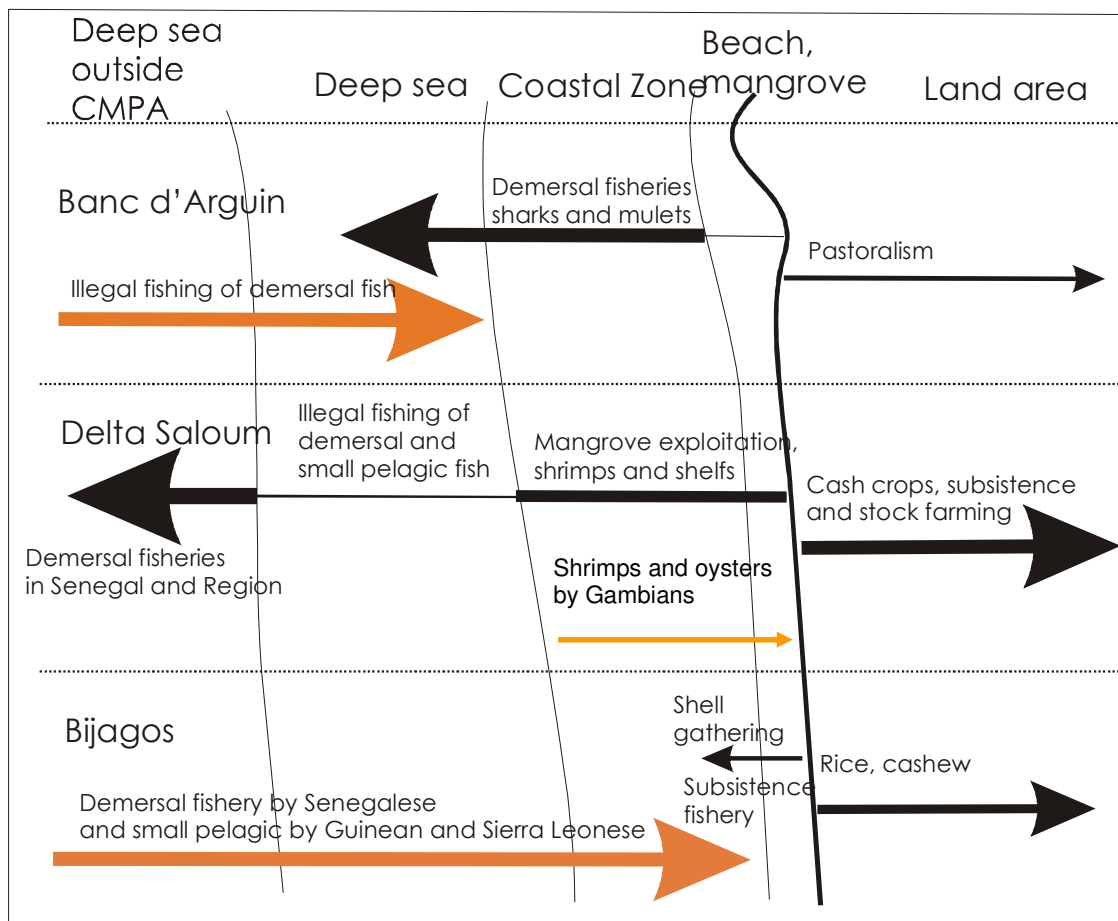


**Figure 1: Map of the three MCPAs**



**Figure 2: MCPA production trends in volume and value terms**





**Figure 3: The limits and importance of natural resource exploitation (with a specific focus on marine resources) by the resident and allochtoon populations**

Note: The black arrows represent the income sources of the resident population and the gray arrows these of allochtoon operators. The size of the arrows indicates their relative importance.

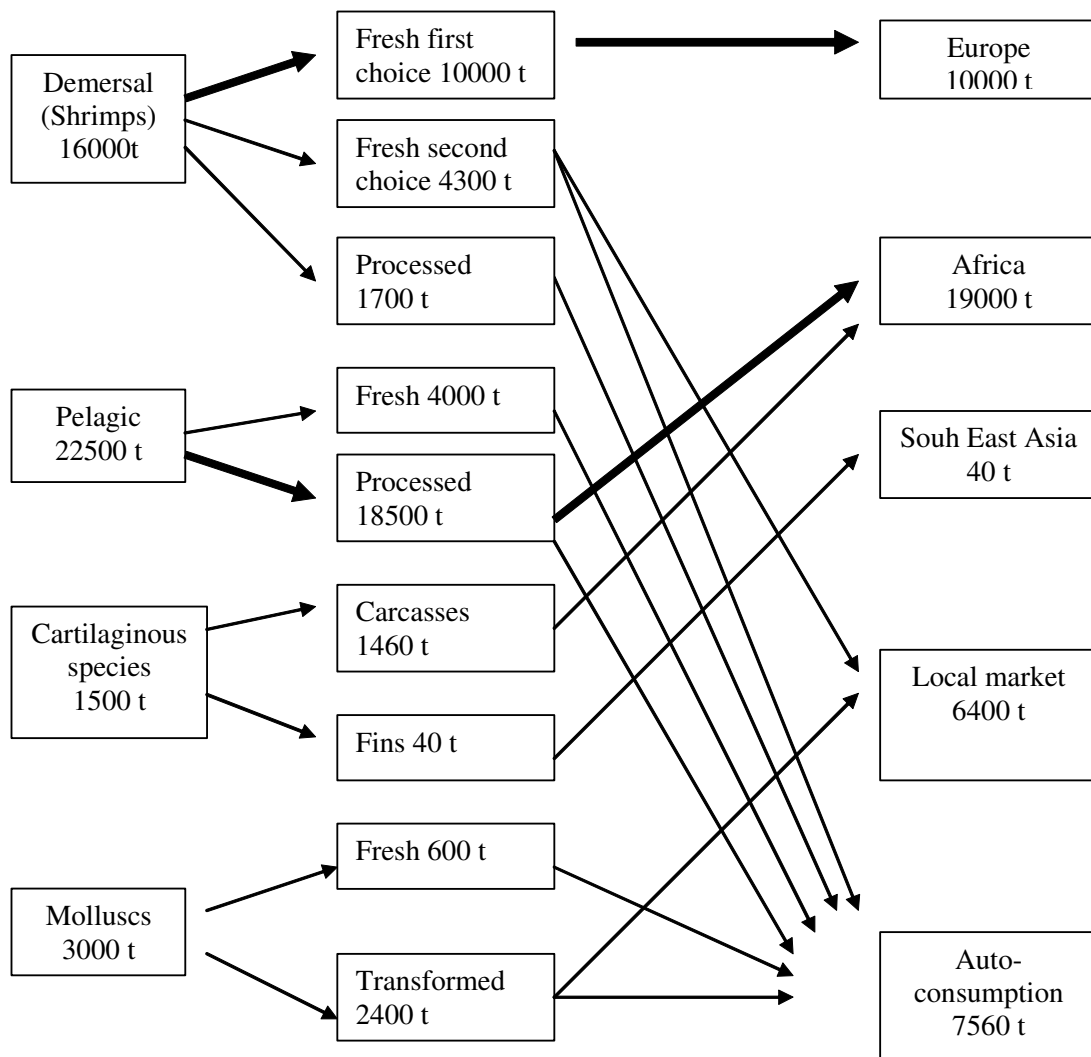


Figure 4: A global representation of product flows in the MCPAs (tons)

**Table 1: The main characteristics of natural resource exploitation of the three MCPAs**

	Number of fishermen MCPA	Production MCPA (t)	Production Value MCPA (million €)	Maritime area MCPA (km <sup>2</sup> )	National industrial production (t)	National artisanal production (t)	National EEZ (km <sup>2</sup> )
Banc d'Arguin	400 <sup>a</sup>	6000 <sup>b</sup>	9,5 <sup>c</sup>	6000 <sup>d</sup>	560000 <sup>e</sup>	80 000 <sup>f</sup>	230000 <sup>g</sup>
Sine Saloum	7360 <sup>h</sup>	17000 <sup>i</sup>	2,5 <sup>j</sup>	1800 <sup>k</sup>	150000 <sup>l</sup>	270000 <sup>m</sup>	158000 <sup>n</sup>
Bijagos	1190 <sup>o</sup>	13500 <sup>p</sup>	10,5 <sup>q</sup>	4854 <sup>r</sup>	44381 <sup>s</sup>	25000 <sup>t</sup>	124000 <sup>u</sup>

Source : a. (Failler, P., M. Diop, C. A. Ould Inejih, M. A. Dia, and Ould Soueilim M.M., 2004b) / b. Année 2002 (Ould Inejih, C. A., 2003) and field surveys ; inclusive of 2500 t of estimated illegal catches /c. Field surveys /d. Maritime share of the Banc d'Arguin (Worms, J., 2002) /e. (Failler, P., M. Diop, C. A. Ould Inejih, M. A. Dia, and Ould Soueilim M.M., 2004b) /f. (Failler, P., M. Diop, C. A. Ould Inejih, M. A. Dia, and Ould Soueilim M.M., 2004b) /g. (Bru, H. and M. Hatti, 2000) /h. (Deme, M., 2004) /i. (Deme, M., 2004) /j. Field surveys /k. Total area of the estuarine part of the Park (180000 ha) as it is estimated that between 87 and 95% of fishing activities are concentrated in this part (Sarr, O., 2002) /l. (Deme, M. and D. Thiam, 2001) /m. (Deme, M. and D. Thiam, 2001) /n. Sea Around Us Project /o. (CIPA, 2004) /p. CIPA data 2004 ; inclusive of 5500 t of estimated illegal catches /q. Field surveys/r. Maritime area of the archipelago (Total area of the archipelago (islands and water areas) = 6400 km<sup>2</sup>, islands areas = 1546 km<sup>2</sup> (Limoges, B. and M.-J. Robillard, 1991)) /s. (CIPA, 2004) /t. Estimations SIAP 2004 /u. Sea Around Us Project.

**Table 2: The limits of influence and control possibilities of the resident population on natural resource exploitation in the three MPAs**

MCPA	Products	Production	Processing	Marketing
Banc d'Arguin	Mullet for resident consumption	I	I	I
	Mullet for national consumption	I	I	E
	Demersal by Imraguen fishermen	I (E)	E	E
	Demersal by allochtoons, illegal fishing	E	E	E
	Cartilaginous species	I (E)	E	E
Saloum Delta	Shrimps by resident	I	I   E	E
	Shrimps by allochtoons	E	E	E
	Ethmalosa for local consumption	I	I	I
	Ethmalosa for the Guinean market	I (E)	E	E
	Oysters for auto consumption	I	I	I
	Oysters by Gambian women	E	E	E
	Demersal for the European market	I (E)	E	E
Bijagos	Pelagic salted/dried	E	E	E
	Pelagic salted/dried for resident consumption	E	E	I
	Demersal by Senegalese fishermen	E	E	E
	Demersal by northern Bissau Guinean fishermen	E	E	E
	Shellfish by resident women	I	I	I
	Shellfish by Papel allochtoon women	E	E	E
	Coastal demersal for auto consumption	I	I	I

Note: The term « I » means intern or the deed of the resident population, as opposed to the term “E” meaning exogenous (allochtoon) or carried out by national or foreign allochtoon operators, transformers or traders. The use of two different shades (light and dark) is aimed at highlighting the boundary between resident and Allochtoon activities. The notations between brackets help in defining the true nature of the control of the chain. It needs also to be stated that only main configurations are hereby described.