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Extension of the country needs and vulnerability of the protected surfaces in sahelian Africa (Case study of the Reserve of Binder-Léré Fauna in Chad)

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Abstract: ***The extension of the populations' needs which follows the rate of the demographic growth poses the problems of the durable development in many African countries. The conservation of the protected surfaces is put in evil by the conquest for survival, the research of the incomes and the weak manpower of the agents of National Forestry Commission to sit a monitoring with the size of the objective laid down by the creation of the surfaces. The case of the reserve of the Binder-Léré fauna in Chad is illustrative. There are texts which prohibit human activities in the perimeter and others which permit people living in the same area the right to do the same activities. This superposition of rights states the question of management of spaces and the resources of the aforementioned reserve. It results from it many consequences. Apart from the deterioration of the physical environment of the area, the destruction of the cultures, the attacks between man and fauna and the poaching are common. This article wants to be an appreciation of the dynamics of the reserve in response to the behaviors of human in the extension of their farming and food needs.***

Key words: Peasant- protected surfaces -Fauna- Usage-Conflict-Binder-Léré.

I. INTRODUCTION

The questions relating to the protection of the natural resources do not go back to today. They, for a long time, were taken into account in certain usual and religious considerations (GRAEFEN C and Kirsch-jung K-p., 2005). It is the case, for example, of the Indian emperor, Ashoka who promulgated the first edict into 252 before J.C. to protect certain natural, animal or vegetable richnesses. These concerns accelerated thereafter these last centuries leading to conventions and acts (MALDAGUE Mr., 2009).

On a world level, the first two conventions go back respectively from 1900 and 1933. The first sets the base of the environmental protection. The second seems to be the response to concerns of the colonizing countries vis-a-vis to the regressive evolution of the forest resources (LARTIGES A. and TIOMOKO D., 2009). In Africa, the first acts of environmental protection go back to 1968 with the charter of the Organization of the African Union (OAU) of Algiers (Algeria). It was from this time that Chad, with the support of its partners for the development, started the mechanism of the environmental protection with rules inherited from the colonial past (CHARLES L and KALAORA B, 2008). Thus, a dozen perimeters covering at least 13 055 310 ha, that is to say 10 % of the territory, were put in defens of which that of Binder-Léré created by Presidential fiat N°169/PR/EFPC/PNR/74 on a space of 135 000 hectares.

The article 4 of the aforesaid fiat prohibits all human activities inside this perimeter. However, it authorizes with the inhabitants being inside the reserve to preserve the rights of user except for the

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captures for the manatees, the crocodiles and the varans as well as the right of gathering, harvests of the natural products and collecting of the deadwood. But the groxtBut the growth and the need of the population increase leeding to the deterioration of the ressources put in defens.

II. FRAME AND METHOD

A. Spatial frame of the study

The Binder-Léré Reserve is located in the extreme South-west of Chad between 9°30 and 9°50 N and 14°10 and 14°40 E.It depends to the three cantons (Binder, Lagon and Léré) in the administrative department of Lake Léré. It includes two lakes with that is (40,50 km²) and the lake Tréné (10,50 km²) during the lowest water level (PRODALKA, 2008). The two lakes behave as a vat which opens in the west towards Bénoué (Cameroun) during the flooding periods taking the road to the Atlantic to the Niger river (cf. appears n1) (PALOU B-L, 2005).

Figure 1: Localization of the Reserve

Source: PRODALKA, modified and adapted by PALOU B-L, 2015.

It includes a soudano-sahelian field under an annual average pluviometry varying around 950 mm the maximum changes of the beginning of the rainy season do not last very long (15 to 20 days). The duration of the season depends much more to the beginning than the end of the season. The average dates of beginnings and end of the rainy seasons begin respectively from the fortnight of May and end from the fortnight of October (DREM, 2011). The potential of the grounds consists of the easily flooded plains in certain zones and makes it possible to develop a range of more productive cultures. The kind of agriculture pratised there is the one of the rainy season and the opposite-season on the floody plains (FROMAGET Mr. and CHEVERY C, 1962). In this area people use no more agricultural materials to produce food crops, cotton, oleaginous plants and tubers.

In the forest peristyles, meets a remarkable vegetable diversity, in particular on the edges of the principal affluents of Mayo-Kébbi in forest galleries, heavily thick. The landscape is of the type of savanna raised to those of grassy savannas with Combretaceae where the herbaceous carpet is characterized by the absence or the scarcity of graminaceous perennial varying thick with sparse according to area

The faunistic population is composed of nearly 190 species of birds and 38 species of mammals such as giraffes, buffalo of West Africa (Synceruscaffer savanensis), hippopotamus, Hypotarques, the manatee (Trichechus senegalensis), etc (UICN, 2004; HANGING-POST P., 1995).

B. METHODOLOGY AND TOOLS

The method which made it possible to carry out this study is based on the direct observations and on the investigations through the visits of ground and the data of the ones and others into the set of themes and the site. Four soils were selected more closely to observe the problems of management of protected surfaces in front of the peasants behavior. It gathers It gathers the villages Goungou, Tozoko, Tréné and Latta. The diachronic charts were carried out with the MapInfo software through the Landsat images of the years 1996 and 2007. The operated transects in the zone of study from project PRODALKA enabled us to calculate the Kilometric Indices of Abundance 10 (IKA10) of the phenomena

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observed on every ten kilometers. ¶These various indices are obtained according to the following formula:

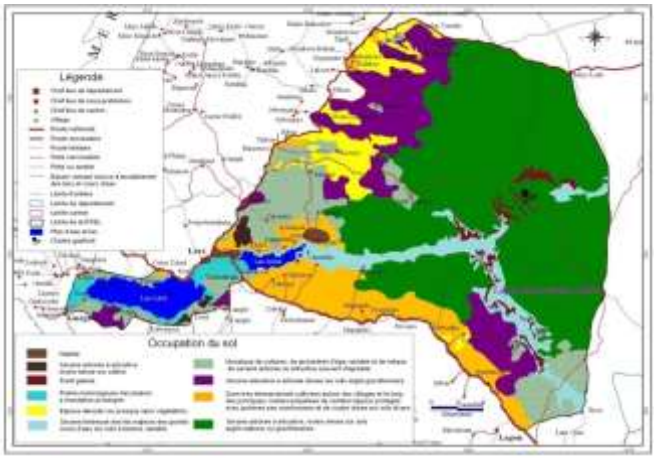
IKA = SPOT/SDPT
Kilometric indices of Abundance 10 (IKA10)
SPOT: Sum of Phenomena Observed at the time of all Transects
SDCT: Sum of Distances Covered at the time of Transects measures in kilometers 10 of them

III RESULTS

A. A formerly stable and dense space

For a long time ago the reserve remained a dense zone of vegetation and gathered a great amount of animal of different species as we enumerated above (cf. figure n°2) It held this state from its enclavement and the presence of the onchocercose which prevailed there. Some Some formerly significant villages such as Bissou and Binder Naîri were reduced in population. Others even disappeared because of the growth of the number of blind people due to the bite of stimulies (Tam for example). Finally villages were ordered to move (Gouin de Fouli Yakabo and of Lathed). The time rate of bite of stimulies was 33 near to the embouchure of the Mayo-kébbi River, 400 at the level of Gauthiot fall, 38 in Binder Naîri and 8 in Tezoko (TAUFFLIEB R. 1955).

Figure 2: Reserve in stable state



Source: PRODALKA modified and adapted by PALOU B-L, 2015

But the interventions of the colonial authorities through the «Imagocide Campaigns» changed deal from 1954. The first that was carried out on February 15th 1954 was put in a private firm called Survey firm for the Cleansing of the Overseas Territories. Thus these interventions reduced considerably the misdeeds of these insects gradually facilitating the return and the exploitation of the resources on the field a few decades later. Indeed, the various human settlements contributed in addition to cultivated surfaces, to the development of the stripped zones and the increasing reduction of the vegetable cover. Nowadays, this reduction concerns to shrubby savanna on the sablo-argillaceous grounds near to the course of Mayo-kébbi. People can see it cruelly in the East of the reserve. It happens It happens as a result an increase of cultivated surfaces never known before on the percentage of about 30% (Cf. figure n°3).

In South-west area the increase seems more spectacular. The use of the resources in the protected zone seems to be closely related to the demographic growth of its population (1,7% in 1963 to 2,3% in 1969 and more than 3% in 2009, according to General Census of the Population and the Habitat, 2012). The surfaces development almost doubled during the twenty last years. The facility of expansion of agricultural spaces is related to the demographic pressure, doubled by easy accesses to the agricultural intrants facilitating the agricultural works. The painfulness of the agricultural work is reduced to 81 days per hectare before the coupling at 20 days with the animal haulage and at 4 days with the hectare during the period of the use with excess of the agricultural intrants (PALOU B-L, 2014).

Figure 3: State of degradation of the Reserve of Fauna Binder-Léré

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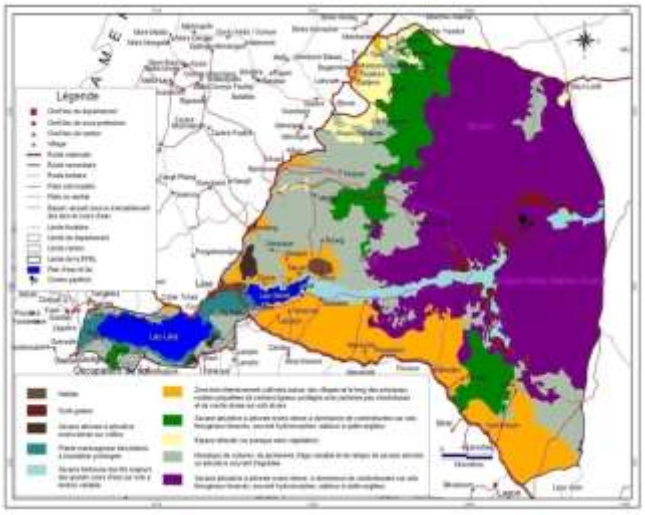

Source: From PRODALKA, adapted and modified by PALOU B-L, 2015

Currently in the reserve as the chart n°3 shows it, the landscapes are composed of a mosaic of cultivated fields, fallowes at various stages of reconstitution and protected zones. These landscapes have a balance weakened more and more by man whose action is characterized by the power and the extent of his impact on the ecosystems. The land exploitation was done in the difavour of the natural vegetation which does not cease accelerating gradually towards the south-west of the reserve, as the human footprints show it on the biodiversity.

B. A regressive evolution of the duration of the fallow, signs of a strong deforestation

A follow-up of fallow on the soil of Goungou in the west of the reserve during the six last years offers a result consigned on the picture n°1. The result puts forward landed saturation, signs of a strong deforestation.

On picture n°1, the duration of the fallow is decreasing in size as well as in duration. In 2003/2004, three hectares of pieces of land were left fallow during five years, two other hectares of pieces of land were left fallow during 4 years, four other hectares of piece of land were left fallow during three years and 6 hectares of pieces of land knew two years of fallow and eight other hectares during one year piece of land. One year later, two hectares left fallow during five years and to others left fallow during five years were found. Until 2013/2014, the soil has only one hectare peaces of land left fallow during one year. The reduction pieces of land put left fallow reflects the land saturation, signs of a strong deforestation within the reserve.

Tableau 1: Duration and amount of fallow evolution in Goungou soil

Duration / Years	5 years	4 years	3 years	2 years	1 year
2003/2004	3 ha	2 ha	4 ha	6 ha	8 ha
2005/2006	2 ha	2 ha	3 ha	3 ha	7 ha
2007/2008	1 ha	2 ha	1 ha	2 ha	4 ha
2009/2010			2 ha	2 ha	2 ha
2011/2012				1 ha	1 ha
2013/2014					1 ha

Source: Results of ground, 2004-2010

The passage on the ground leads us to affirm that the growing demographic pressure involved a concomitant increase in the cultivated surfaces according to two methods: reduction of surfaces left fallow so that they may become accidental in certain soils and, extension of the exploited fields for culture of millet on sandhill, towards the piémonts and the setting in culture of the argillaceous hollows usually reserved for the pastures and the gathering. Most of the peasants (more than 45%) have 3 to 6 hectares, followed by almost 30% of the peasants who have only 2 to 3 hectares. Rare (5%) are those which have between 8 to 10 hectares pieces of land and 2,5% between 10 to 12 hectares.

C. The direct anthropical factors and their effects on the natural resources

1. The anthropical factors: The active forces of the reserve are due to the anthropical factors from

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which the most burning are the selective cut of wood, the clearing, the bush fires (Photo n°1), etc. They are the major carriers of disorders of anthropogenic origin and causes damage on the vegetation. These effects depend closely on the type of vegetation and their interactions with the specific ecological factors on the environment such as the ground and the rainfall.

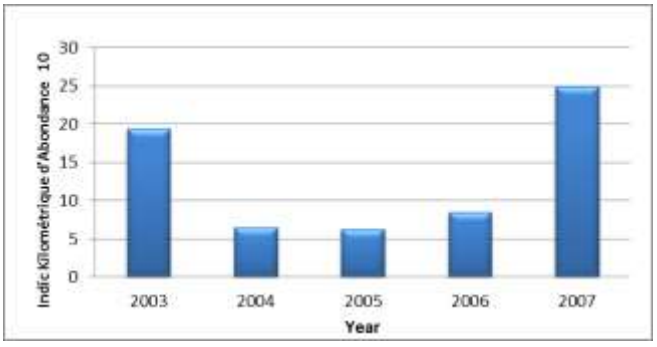
The peasants before installing a new field, cut and burn deforested space. There are also the There are also the bush fires which reflect the voluntary or accidental characters of the action of man.

Photographs 1: Type of bush fire for the installation of the fields in a reserve

Source: Photo catch on the ground, SOUGNABE P., 2010.

The Kilometric Indices of Abundance on 10 kilometers (IKA10) of the bush fires over seven years are visualized on the figure n°4.

Figure 4: Evolution of the bush fires in Kilometric Index of Abundance.

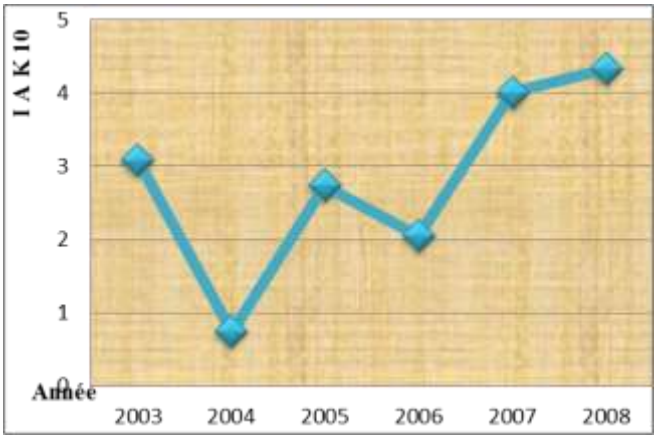


Source: From the data of PRODALKA, 2010.

The bush fires noted on every ten kilometers at the time of the transects in the reserve from 2003 to 2007 are seen with various degree according to years. The recurrence of fire supported by the selective cuts of wood denudes the ground and supports the entrenchement as well as hydric and eolian erosion.

The cultivation methods, the research of domestic energy and the habitat are at the main causes of the selective cuts of wood on the ground. For For example, the multiple cuts of Pterocarpuserinaceus for the pasture, added to the recurring fires in the reserve, prevent this species from expressing its strong impact and involves at the same time a fall of its manpower. On the other hand, the Acacia seyal often eliminated by these same cultivation methods and the strong mutilations for the pasture behave like a pioneer species invading the fallow thanks to its strong strong impact and the significant dispersion of its seeds. The evolution of the selective cuts of wood according to transects observed on every ten kilometers between 2003 to 2008 are visualized on the figure n°5.

Figure 5: Evolution of the selective cuts of wood noted in transects (2003-2008)



Source: data of ground and PRODALKA, 2010.

The new human settlements are also counted among the direct factors of the degradation of the reserve. The surface of the Reserve of Binder-Léré Fauna expresses the most significant demographic pressure, mainly explained by the

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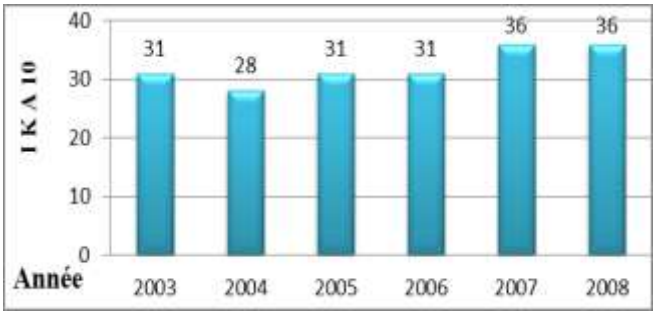
agricultural settlememnt of migrants coming from Fianga and Gounou-Gaya owing to the presence

Years / Cultures (ha)	2007/2008	200820/09	2009/2010	2010/2011
Sorghum	39	45	58	125
Maize	7	12	45	75
Rice	1		23	21
Peanut	8	10	18	22
Taro cards	-	12	21	15
Manioc	4	75	45	64
Others	73	123	102	125
Total	124	273	314	447

of the cultivable grounds as well as the pasture. In 2014 the head of forest quartering of Léré said, more than 70 hearths coming from Fianga and Gounou-Gaya closer to the reserve settled there devastating more than 100 hectares of the pieces of land. This demographic pressure generates a projection of the agricultural front. From 2003 to 2008, the new villages and districts are noted on the transects as the figure shows it below.

Figure 6: New settlements noted according to transects on each 10 km according to years'



Source: From the data of PRODALKA, 2010

2. *Resource sharing of the reserve and interactions Man/fauna:* The resource sharing of the reserve between men and fauna is regularly the cause of a promiscuity which appears by threats or destruction of cultural, forms of aggressions and a stressing of poaching (DIALLO M. S, (2011).

2.1 The damage of the mega-herbivorous on the cultures: The damages of mega herbivorous fauna on the ground are various. Two .Two species are responsible of this. They are elephants and hippopotamus. These noted damages are excesses of pasture (mutilations), tramplings or the predation. The mutilation consists of the direct consumption of the vegetable parts or taking away on the vegetable cultures. Tramplings are the repeated passages of the mega herbivorous on the sowed pieces of land. The damages noted during the five last years are as shown in the following picture.

Tableau n°2 : Evolution of the damages caused by mega herbivorous on the reserve

Source: National Agency for Rural Development and works on terrain

The damage caused by the hippopotamus is related to its strictly herbivorous diet. It nourishes itself, by tearing off grass after having it pinch with its lips. It is very often between 17 h in afternoon and 8 H in the morning according to whether the hippopotamus feed. In the course of the day, they have a rest or sleep (BOISSERIE J R., 2005). This agrees with the first hours of the farmers and fishermen activities (GUILLAUME Mr., 2013). It results from this accidents caused by these pachyderms which generated three cases of loss in human lives in 2004, three cases in 2008 and two in 2010.

The damages caused by elephants on the cultures are mainly by tramplings than by mutilations. Indeed, the diet of the elephants varies according to the seasons and from its vital surface. But the damage is often considerable because of their exit in herds. Approximately 200 heads of elephants are considered present in the reserve (HANS JÜRGEN K and FOAMED A., 2008). Until today four cases of mortal attacks of man were recorded only in 2015, respectively in the villages of Bitem and Tissangré in the Binder canton.

2.2 poachings, a subject difficult to explore: The poaching in the Reserve of Binder-Léré Fauna seems to be a taboo subject. Nobody

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accepts to answer the questions because of appearing trapped. In the the Agency of National Forestry Commission of Léré, one knows that there are poaching of different kinds. One meets the poaching of game operated by hunters, that of the manatees (Trichechus senegalensis) often operated by the local and foreign fishermen (cf photographs n°2).

The game poachings are carried out caused by the poisoned arrows, collets, handycraftsman weapons (Gourloum). The head of forest cantonment recognizes the death of more than 100 elephants in 2014, caused by the poachers from Sudan and another killed by a poacher from Cameroun. These poachers have chemicals which help them to quickly remove defenses of their victims. This action undermined the number of the elephants of the reserve.

Several methods are used to kill manatees, an species protected so such. The trawl lines designed from the hooks of large gauges (7/10), the nets with large mesh woven locally for the circumstance, the seines of beach, the set nets and the especially manufactured lances are the weapons used in the poaching of this mammal.

Photograph 2: Body of a manatee poached by the fishermen, floating on the Lake Léré

Source: Photo catch on the ground, P B Ludovic., 2010.

IV. CONCLUSION

The Binder-Léré Fauna Reserve is a protected space by legal documents of which the decree 169/EFPC/PNR/1974. But force is to note that, in spite of the significant legal arsenal, the violations continue to cause many damages. Prohibitions are not respected. The noted causes are numerous. Among those, demographic pressure on the nature, accompanied by poachings of certain protected animals for research of incomes. The cohabitation between men and faunas in the reserve is the major problems. The consequences of this cohabitation take shape in the agricultural activities. The peasants completely or partly lose their agricultural production with the passages of the wild animals. This shape of damage makes slow down work and influence on the agricultural outputs. The country socio-economic organization of the zone is very often damaged. This situation is to be charged to the failure of the framework of the creation of the reserve. The Legislator authorizes the population living in the reserve to practise their activities without projecting the glance on their coming demography.

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