

ANALYSIS OF HOSTILE BEHAVIOR AND DEPENDENCE OF THE RIVER PEOPLE OF THE BENSLIMANE PERIFORESTIER AREA WITH RESPECT TO FOREST RESOURCES, MOROCCO

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Abstract : *The atlantic cork oak of benslimane emerges a specific problematic where several constraints cause, continuously, a very accentuated pressure. The resilience of the forest has diminished considerably and the signs of its degradation are very apparent. Indeed, rural poverty and population growth are highly dependent on natural resources and their misuse. This results in overgrazing and illegal woodcutting.*

The results of other studies based on remote sensing and GIS techniques have found that cork oak and Tetraclinis, which are the main species of the Benslimane forest, have experienced a clear regression, namely 35% of the surface area of the forest. cork oak and 50% of the area of Tetraclinis compared to their initial area in 1994 [1].

The degradation of the forest of Benslimane is not a new phenomenon, already the action of man on this natural environment was manifested at the beginning of the century, but it has particularly accentuated these three last decades because interference from several natural, forest management and anthropogenic factors. This article aims to analyze anthropogenic impacts on the degradation of the Benslimane forest. The analysis of offenses statistics, taking into account their interannual variability, over a period of 32 years (1984 - 2015), made it possible to deduce that the number of offenses drawn up by foresters during this period is 399 offenses for the overgrazing; 37% of all offenses. While the number offenses of cutting and removal of wood is of the order of 243 offenses, or 23% of the total of the offenses drawn up, an average of 33,4 offenses / year, all categories taken together ; of which 8 offenses / year of wood cutting; the equivalent of a volume of 24.5 m³ / year. Physical losses by forest species are estimated at 18.4 m³ / year for cork oak and 6.1 m³ / year for Tetraclinis; which is relatively low compared to other similar Moroccan forests.

Keywords – overgrazing, illegal woodcutting, anthropogenic factors, degradation, offenses

I. INTRODUCTION

The Moroccan forest covers about 9 million hectares. It provides production functions (wood, firewood, mushrooms, honey, medicinal plants) and protection and recreation (protection of soils, fight against erosion, storage of carbon, improvement of the framework life and landscape and aesthetic value, etc.). Nevertheless, Moroccan forests are landscapes that are very open to their socio-economic environment and therefore subject to strong anthropozoic pressure, leading to the degradation of forest and peri-forest ecosystems through deforestation (31000 ha / year) [1].

The rural populations in Morocco live from a subsistence economy based on livestock. The forest is exploited for leaf fodder and fuelwood; this exploitation is regulated by customary institutions [2] .

Analysis of the data on the distribution of the different overgrazing classes on a national scale shows that grazing pressure is relatively low in 9% of the national territory; Whereas it is strong and excessive on 26% of the territory, with an overrun of the potentialities of 2 to 5 times depending on the zones [3].

The forest of Benslimane is one of the most important forests of cork oak in Morocco. It is characterized by a flora presenting a biological spectrum common to the flora of Morocco, located in the Mediterranean-Atlantic floristic domain. It is composed mainly of stands of Cork oak, Thuya and Cistes's Matorrals, which reflect the result of the interaction of the various factors in the physical, ecological and socio-economic environment, condition the current state of this biological association.

The forest area of Benslimane highlights a real integration of the using population and their practices in the adjacent forest environment. It is located close to the user douars who maintain a permanent contact with the forest, expressed by the exercise of its right of use governed by the regulations in force. Parallel to this legal practice which largely dominates the relationship between the forest and the rural population, it unlawfully and excessively harvests firewood, forage units and secondary products.

The objective of our research study is to analyze the various anthropogenic factors responsible for the regressive evolution of the Benslimane forest.

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II. MATERIALS AND METHODS

A. Presentation of the study area

The forest of Benslimane extends north of the city of Benslimane, on a rough area of 12262 hectares. On geographical plan, it is located between Rabat (administrative capital of Morocco) and Casablanca (economic capital of Morocco), almost in 25 Km in the South of the freeway linking both capitals. Administratively, the forest belongs to the province of Benslimane, the Circle of Benslimane, Caidat Ziaida, Rural Commune of Ain Tizgha (94%) and the Urban Commune of Benslimane (6%) in a relatively unequal proportion. The area is located in a semi-arid bioclimatic, except for the coastal band (Bouznika-Temara) which is subjected to a bioclimatic wet. The average annual rainfall is in the order of 401 mm. it's a very soft pen plain, exposed north-west, whose extreme altitude not exceed 280 m. The most encountered geological formations are shale, sandstones and quartzite of the primary base, red clay triassic, limestones, marls, sandstone, sandand quaternary silts [4].

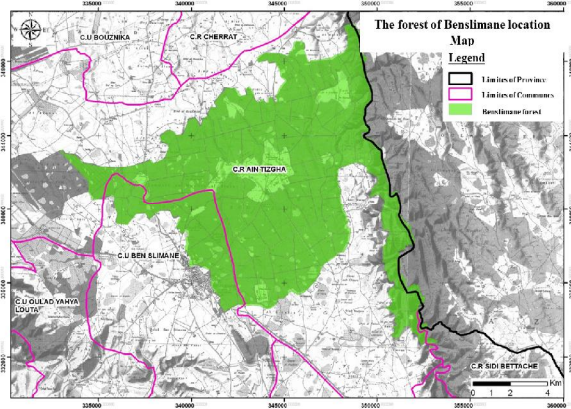


Figure I: The forest of Benslimane location Map

B. Methodological approach

The entire territory of the study area is divided between the fractions of Beni Oura, Beni Mexal, Lahsasna and Dghaghia. The definition of the real users who directly exploit the natural resources, allowed to identify the main rural actors who act on the forest (Table 1). The user population of the forest is estimated at 15350 (about 2578 households). The growth rate recorded a low value between 2004 and 2014 (2.82% for the Municipality of Ain Tizgha and 1.6% for the Municipality of Benslimane).

Table I : User population

Municipality Rural/Urban	Users douar	Household	Population
CR Ain Tizgha	16	2016	12331
CU Benslimane	2	562	3019
Total	18	2578	15350

Source: General Population and Housing Census, socio-economic surveys 2014-2015 [6]

The increase in the user population of the Benslimane Forest leads to an increase in the need for woodfuels and rangelands. Consequently, these cork oaks are threatened

with over-exploitation (overgrazing, pressure on firewood, clippings, lopping, etc.).

Anthropozoogenic pressure on the benslimane forest has contributed to its degradation. The role of the forester in curbing this alarming state is limited to verbalizing offenders. Moreover, the offenses drawn up can neither heal nor revitalize the forest, they allow at least to give an idea on the degree of aggression on this forest. Also, it should be noted that these data could express an underestimation of the offenses, since others would escape the control of the forester. Thus, to approach the importance of criminal practices in the forest of Benslimane, we based on the counting of archives of the Provincial Directorate of Waters and Forests of Benslimane. To this end, we used the analysis of the interannual variability of offenses over a 32-year period from 1984 to 2015, based on the analysis of statistics on the findings of offenses by type. This allowed us to approach the level of insertion of the population in the forest area on one side and the level of demand formulated by these residents towards this space on the other side, and to translate then relatively the state of conservation of forest resources.

III. RESULTS AND DISCUSSIONS

A. Evolution and analysis of forest offenses

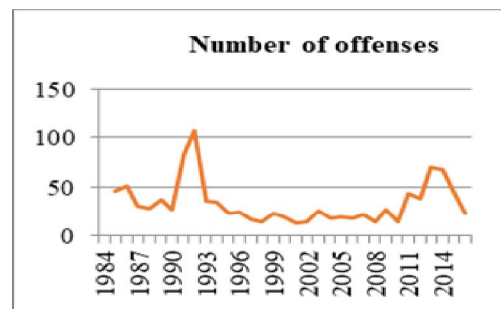


Figure II : Evolution of offenses in the Benslimane forest between 1984 and 2015 [5]

The analysis in Figure II shows the irregularity from one year to the next. Thus, the number of offenses established at the level of Benslimane Forest was very important during the years 1984, 1985, 1990 and 1991 and reached a maximum in 1991 with 107 offenses, or 75% of all PV observed between 1984 and 2015. This is explained by the difficult and very severe drought period experienced by the area between 1980 and 1995.

Also, the number of offenses has slightly increased between 2012 and 2014, ie 33% of the total offenses observed between 1984 and 2015. This is due to the lack of forestry staff for permanent monitoring of the Benslimane forest area during this period. This period coincided with the restructuring of the deconcentrated forest administration services and the adverse climatic conditions prevailing in the region. Also, it should be noted that over a period of 32 years, we recorded 1068 offenses in the forest, an average of 33.4 offenses / year all categories combined.

In addition, the counting of the crime reports recorded during the observation period (1984-2015), allowed us to

note the most attacked forest plots as well as the douars which contain the notorious offenders, as illustrates it in figure III.

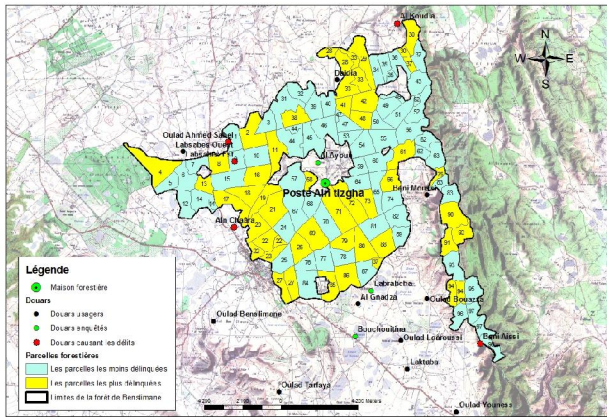


Figure III: Location Map of Forest offenses, Tsouli et al, 2015

B. Evolution of offenses by nature

The examination of the register of offenses made it possible to study and analyze the number of offenses by nature; in this case, the course and cutting of live wood over a period of 32 years.

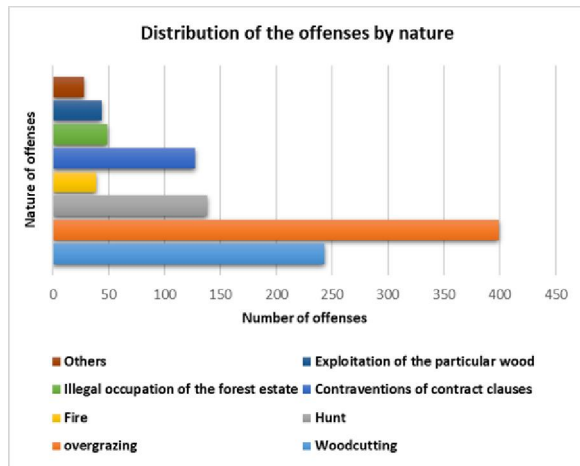
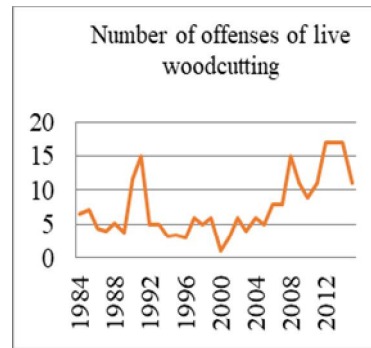


Figure IV: Distribution of the offenses by nature between 1984 et 2015 in the Benslimane [5]

The offenses established in the forest of Benslimane relate to several types of crime. The main offenses committed in the forest is that of the course that dominates in the area, it represents 37% of all crimes. Thus, it is clear that the high demand for fodder causes residents to commit crimes. Hence the place occupied by the forest in the feeding of livestock. The nature of the samples varies with time and environmental conditions. In the rainy year, the pressure is distributed between the herbaceous carpet and the topping, while the misdemeanors are mainly concentrated during winter and spring; periods when there is a forage deficit and extensive use of supplementation for most farms. Wood-cutting offenses come in second with 23%, which shows the needs of

the population in fuelwood. Then, hunting (13%), breaches of the terms of a contract for the exploitation lots sold at auctions (12%), then the illegal occupation of the forest estate (5%), fires (4%), lack of hawking license (3%), removal of secondary products "Myrtle and cistus" (1%), exploitation and / or clearing of the private Wood without authorization (1%). Also, we note the scarcity of land clearance and plowing or encroachment offenses (0.47%); fundamental element for the preservation of the state boundaries of the forest.

Table II and Figure V: Evolution of the number of live woodcutting offenses between 1984 and 2015 in the Benslimane forest [5]



Délits/Année	Coupe et enlèvement du bois
1984	6
1985	7
1986	4
1987	4
1988	5
1989	4
1990	12
1991	15
1992	5
1993	5
1994	3
1995	3
1996	3
1997	6
1998	5
1999	6
2000	1
2001	3
2002	6
2003	4
2004	6
2005	5
2006	8
2007	8
2008	15
2009	11
2010	9
2011	11
2012	17
2013	17
2014	17
2015	11
Total	243

According to Table II and Figure IV, the number of logs of live logging has continued to increase along the years, with the exception of the periods (1992 - 2005), where the number of offenses decreased by reporting that the year 2000 recorded only one crime. It is the period from 2008 to 2015 that has put a lot of pressure on the forest, peaking at 51 in 2012, 2013 and 2014.

It should be noted that out of a total of 243 offenses recorded during the period of 1984-2015, 51% of offenses were recorded only during the last ten years of observations (2006-2015). This confirms that the intensity of the impact of the population on the forest environment was amplified during this period. On the other hand, the first six years (1984-1989) represent only 13% of the offenses. 11% in two years 90-91, 25% in 14 years.

The average annual number of offenses established during this observation period is 7.6.

The demographic component is undoubtedly the main factor in the degradation of the Benslimane forest. Indeed, the growing needs of the local population, especially in energy needs and rangelands, have resulted in excessive logging of this forest.

• **Offenses of overgrazing**

Table III et Figure VI: Evolution of the overgrazing offenses during 32 years (1984/2015) [5]



Débits/Année	Parcours
1984	28
1985	31
1986	4
1987	17
1988	22
1989	16
1990	50
1991	64
1992	22
1993	21
1994	14
1995	14
1996	2
1997	4
1998	12
1999	9
2000	8
2001	4
2002	9
2003	1
2004	0
2005	2
2006	8
2007	4
2008	1
2009	4
2010	0
2011	2
2012	5
2013	2
2014	3
2015	2
Total	399

According to Table IV and Figure VI, the number of trip records increased the most in 1984-95 with a percentage of 79%. However, the number of VP decreased by stabilizing between 1996 and 2015 with an annual average of 4 offenses.

It should be noted that out of a total of 399 offenses completed during the period of (1984 - 2015), more than 72% of offenses were recorded only during the first decade of observations (1984 - 1993). This confirms that the intensity of the impact of the route on the forest environment was amplified during this period. On the other hand, the second decade (1994-2003) represents 19% of the crimes, whereas the last decade represents only 9%, which explains why, theoretically, the Man and his cattle have decreased their pressure on the defenses and the forest in recent years.

The average annual number of offenses established during this observation period is 12.

Analysis of this aspect revealed the following:

- Overgrazing is a major constraint for the sustainability of this forest;
- Fodder units within the forest and defenses are much more appreciated than areas outside forests;
- Artificial plantations, based on Aleppo pine and Eucalyptus (reforestation works), followed by Tetraclinis and cork oak (regeneration works), are experiencing strong pastoral pressure.

This situation is even more accentuated with the global changes marked by a rainfall deficit and an increase in temperature, the non-respect of the defenses as well as the sedentarisation of the herd in the forest.

Breeding based on forest rangelands remains the main source contributing to the income of the village population in the Perforfortier area of Benslimane and is the basic backbone of the rural economy.

C. Evaluation of natural losses

The number of logging offenses and wood removal is of the order of 243 offenses; that is 23% of the total of offenses drawn up. Indeed, over a period of 32 years, 1068 offenses were recorded in the forest; an average of 33.4 offenses / year, all categories combined; of which 8 offenses / year of wood cutting; the equivalent of a volume of 24.5 m³ / year. Physical losses by forest species are estimated at 18.4 m³ / year for cork oak and 6.1 m³ / year for Tetraclinis; which is relatively low compared to other similar Moroccan forests.

IV. CONCLUSIONS

The analysis of crime statistics, taking into account their interannual variability, over a period of 32 years (1984 - 2015), made it possible to deduce that the Benslimane forest was subjected to illegal exploitation due to strong anthropic pressure; namely, logging, overgrazing, clearing and plowing, etc. In addition, the number of offenses reported by foresters during this period is 399 offenses for the route; 37% of all crimes. Whereas the number of offenses of logging offenses and wood removal is of the order of 243 offenses; that is 23% of the total offenses drawn up. Indeed, over a period of 32 years, 1068 offenses were recorded in the forest; an average of 33.4 offenses / year, all categories combined; of which 8 offenses / year of wood cutting; the equivalent of a volume of 24.5 m³ / year. Physical losses by forest species are estimated at 18.4 m³ / year for cork oak and 6.1 m³ / year for Tetraclinis; which is relatively low compared to other similar Moroccan forests.

The demographic component is undoubtedly the main factor in the degradation of the Benslimane forest. Indeed, the growing needs of the local population, especially in energy needs and rangelands, have led to the degradation of this forest.

Despite the recently established security mechanisms, the results are more or less satisfactory since forest crime is strongly rooted in the practices and customs of local populations.

Faced with this situation, the department, handicapped by the lack of human and material resources, continues to deploy considerable efforts in terms of surveillance, repression and control without being able to stop this regressive dynamic of the forest. In order to mitigate this worrying situation that threatens the sustainability of natural resources and the stability of the population, a concerted and participative approach aimed at developing and conserving the forest heritage and improving the living standards of local residents is essential. with acuity. This approach will have to take into account the aspects of socio-economic development as a pledge of success of the technical actions of silviculture and rehabilitation. Indeed the conservation and the sustainable management of the forest ecosystems are closely linked to the socio-economic activities and thus to the value of goods and services collected by users whose income and livelihood depend on them.

The well-being of local people is conditioned by sustained incomes over time and the satisfaction of their needs for goods and services offered by the forest (fodder,

fuelwood, non-wood forest products (acorns, aromatic plants, etc.). .

Also, an efficient and mutually beneficial partnership between users, private actors and the State is the key to developing a socio-political environment conducive to participatory management.

Hence, the need for the effective integration of these populations into the forest economy through the design of socio-economic models for the implementation of a participative and sustainable management of Benslimane cork oak

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