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RESEARCH ARTICLE

The State of the natural middle under the human pressure in the west of Algeria

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Abstract

This contribution aims to show some aspects of human pressure which threatens the natural middle of the region of Maghnia.

A semi-arid bioclimate and a strong human pressure that prefer vegetation which is dominated by thorny xerophytes that constitute degraded matorrals rather than forest formations. That is what our floristic analysis showed.

The pedological approach demonstrates that the state of vegetation, the nature of the soil and topographical conditions can influence the risk of erosion.

Both the agricultural vocation of our study area, its proximity from the urban centers, and the impact of the construction of Hammam Boughrara dam lead us to assert that we are facing a process of pronounced degradation.

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INTRODUCTION

the whole Mediterranean region is marked by the imprint of man for a very long time and for this he has to go back more than 1000 years before our era to find natural landscapes to the blank state. Rights by developing agriculture since antiquity has almost everywhere model the landscape. Land degradation fresh by the disappearance of trees has caused erosion and has destroyed the vegetation cover. Over the past millennia, the combined action of the ax, fire and grazing has caused the transformation of the drills in matorrals. The matorrals sparse were destroyed in their turn to yield to the thorny species and/or toxic. In effect for a few years, the man has become the main factor of degradation, if neglected to dwell on the consequences of his intervention no landscape would be intelligible (the consideration of the vegetation the proven on several occasions), as the said El Hai (1974) if its action goes back in the distant past, it has become today a unlimited efficiency. Several jobs have attached great importance to the problems related to the anthropogenic effect. It cited as an example: Sari (1977), Le Houerou (1980), Bouabdallah (1991), Meziane (1997), Bouazza and Benabadji (1998), Quezel (2000) and Aboura (2001).

The negative consequences of human pressure in the semi-arid regions affect our region of study, in this case the region of Maghnia. We are trying through this contribution to demonstrate some aspects of the anthropogenic action as well as the impact on the natural environment of our region. These different actions in the form of pressure on our forest ecosystem or of what remains (matorral gradient) deserve to be diagnosed.

Methodology

The region of study is part of the Wilaya of Tlemcen, and corresponds exactly to the commune of Hammam Boughrara which extends over a surface area of 167 km² (Daira of Maghnia) and ensuring a junction between the plain of Maghnia and the Traras. We turned our attention to an area called: Forest Bled located upstream of the dam Chahba Hammam Boughrara 10 km north-east of the agglomeration of Maghnia, 34 ° 53 'north latitude and 40 ° 1' longitude Where is. (Figure 1)

The bioclimate of Maghnia region within the meaning of Emberger is semi-arid lower costs winter. The annual rainfall are around 300 mm. A maximum in March of 39 mm and a minimum in July of 2.5 mm The temperature range is about 34 ° C (continental climate). The coldest month is January (1.58 ° C) and August the warmest (36.44 ° C).

The aim in this study is to make a diagnosis of the current state of the vegetation cover of the forest area of Bled Chahba while relying on readings taken at two stations likely be different degree of human impact. Intuitive choice of vegetation surfaces to be studied is made according to phytoecological knowledge of the region, which amounts to a simple mental stratification (Rameau, 1988) or better a floristic stratification (Guinochet, 1973). The ecological homogeneity requires first rule consistency in the physiognomy and vegetation structure of a given surface. Guinochet (1973) claimed that a floristically homogeneous surface is a surface which offers no appreciable differences in species composition between its different parts.

In this context we undertook a floristic and soil survey of our area. The first is based on surveys conducted according to Braun Blanquet method (1952) as well as on transects on two different stations likely degree of human impact, the second on the physico-chemical soil analysis taking into account the Sample location: degree of slope and importance of vegetation cover.

The choice of the two stations was nonetheless guided by the presence of formations matorrals degraded due to combined action of man and his flock that are the subject of our study, we were able to choose two representative stations:

Station 1:

It is situated at an altitude of 420m with a Northwest exposure, with a sizeable recovery rates between 50 and 60%. The relief is little rugged with a gradient 15 to 20% and the substrate mainly consists of fine deposits. The tree layer is more or less represented with a dominance of *Pinus halepensis* and the presence of *Calycotome villosa* subsp.*intermedia* and *Ziziphus lotus*.

Station 2:

It is located at an altitude of approximately 380m, located on the southern slope, the micro relief of this rock the outcrops with a slope of 5-15%. The recovery rate by the vegetation is low and which is between 15 and 20%. The tree layer is represented by *Tetraclinis articulata* and *Pinus halepensis* and we see a strong presence of *Urginea maritima*.

Results and discussion

. Human Activities

The man's action affects all landscapes directly through exploitation of resources, land use by agriculture and urbanization or indirectly by global climate change or pollution caused by the development of the industry.

The most significant impact is the installation of the dam Hammam Boughrara that dramatically changed the face of the region and certainly the natural functioning of the environment. The introduction of the dam and the water level in the original landscape has caused considerable changes in this visual structure: disappearance of certain landscapes, wetlands, submerged trees, flood a stretch of 4 km from the RN 35, which involved the construction of the new bridge for the rehabilitation of flooded new section and that has led to the total disappearance of part of the forest.

The small size of the agriculture and intensive courses pushes ranchers to herd their cattle in the forest, which resulted in over-exploitation of the environment and overgrazing of the site resulting in vegetative form regressive. As Benabdelli reports (1996), our drills are often asked by pastors as an auxiliary source for livestock feed. In the area of Hammam Boughrara 9630 was a global stocking heads for 2011.

Economic activity around our study site is mainly agricultural. For the general population, agriculture is the predominant activity. In these conditions and lack of proper management and preservation of the forest, the destruction of the wooded formation can not be avoided. Sari (1977) proves the saying "An exclusively agricultural economy inevitably grows at the expense of woodlands."

For agriculture, an area of 16672 hectares of agricultural land occupies nearly 58% (9502 ha). Agricultural activity is practiced at 90% on dry land, irrigated land, however, despite their low representation (197 ha in 2010), are an important area in relation to other municipalities of the province of Tlemcen. This irrigated activity is located entirely in the Tafna Valley and knows an extension with the use of water from the dam Hammam Boughrara, much of the area is used by market gardening, fruit trees and citrus.

Craft in its infancy, agricultural activity has intensified with increasing use of machinery and the use of fertilizers and pesticides. The most important effect of mechanization in the practice of the irrigation with an intensive use of pumps, besides the inconvenience caused by the noise, the mechanical pump is capable on the one hand cause a

dangerous lowering of water in areas where it is practiced especially during the summer season, but also be a direct and permanent source of oil pollution during the filling of tanks or because of fuel leakage due to faulty sealing ducts. Deforestation which often causes agriculture or livestock, is a source of loss of biodiversity and soil biological activity. Cultures spread on surface or forest existed and where grazing pressure has increased significantly. It is usually based on extensive livestock transhumance pastoralists or remain the same time farmers.

Sedentary and semi-sedentary clearing exacerbated the problem and the concentration of herds near towns and roads. Quézel (2000) pointed out that the clearing affect at least 1% of total forest area each year in the Maghreb countries. The only positive thing is the absence of large industrial infrastructure in the region, which normally reduces pollution, but the positive aspect is quickly masked by the scale of industrial discharges comers of Morocco and which contribute to the pollution of water sources the region (mainly the dam) and they are a permanent danger.

TABLES, FIGURES AND PHOTOS

Table 1 : Results of Physical and chemical analyses of soil

Station	1			2		
Sample	1	2	3	4	5	6
Depth (cm)	0-30	0-30	0-30	0-30	0-30	0-30
Position	Top slop Slope of 5 to 10%	Mid-slop Slope of 10 to 15%	Lower side Slope of 0 to 5%	Top slop Slope of 10 to 15%	Mid-slop Slope +20%	Lower side Slope of 0 to 5%
Specifications	Good forest cover: <i>Pinus halepensis</i>	Good forest cover: <i>Pinus halepensis</i>	Degraded forest cover : <i>Pinus halepensis</i> , <i>Ziziphus</i>	Very degraded forest cover : - <i>Asparagus</i> - <i>Ziziphus</i> - <i>Urginea</i>	Bar soil and heterometric deposits, appearance of the rock	Heteromé- Tric deposits and degraded forest cover : <i>Urginea</i>
Colour according « Munsel »	10 YR 5/4	10 YR 5/4	7.5 YR 4/4	10 YR 5/4	7.5 YR4/4	7.5 YR 5/4
Granulometry						
% sands	43.41	46.62	44.97	49.05	53.83	45.03
% silts	33.84	34.12	30.22	33.97	31.28	34.90
% clays	22.75	19.26	24.81	16.98	14.89	20.07
Texture	Silty	Silty	Silty	Silty	Silty - Sandy	Silty
PH	6.1 Slightly acid	6.4 Slightly acid	6.3 Slightly acid	6.8 Slightly acid	6.9 Slightly acid	6.9 Slightly acid
Electrical conductivity	0.4	0.1	0.2	0.7	0.3	0.5
Estimation of salinity	Unsalted	Unsalted	Unsalted	Little salty	Unsalted	Unsalted
% CaCo3 Amount	21.6 Average	19.5 Average	22.7 Average	23.5 Average	14.3 Average	20.5 Average

Organic carbon	1.85	1.52	1.36	1.2	0.48	1.04
Humus (%)	3.18	2.62	2.34	2.06	0.82	1.79
Estimate	Fort	Average	Average	Average	Very low	Low

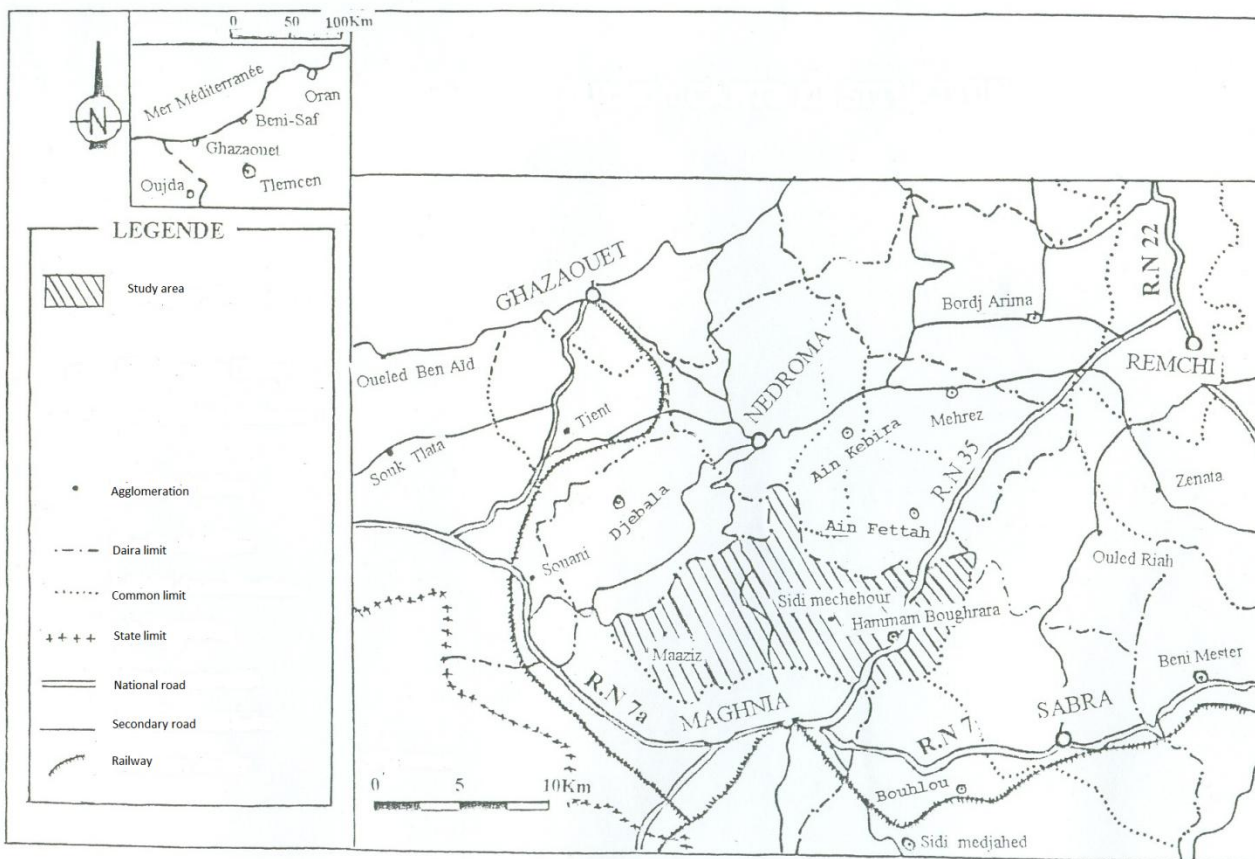


Figure 1 : Geographical location map

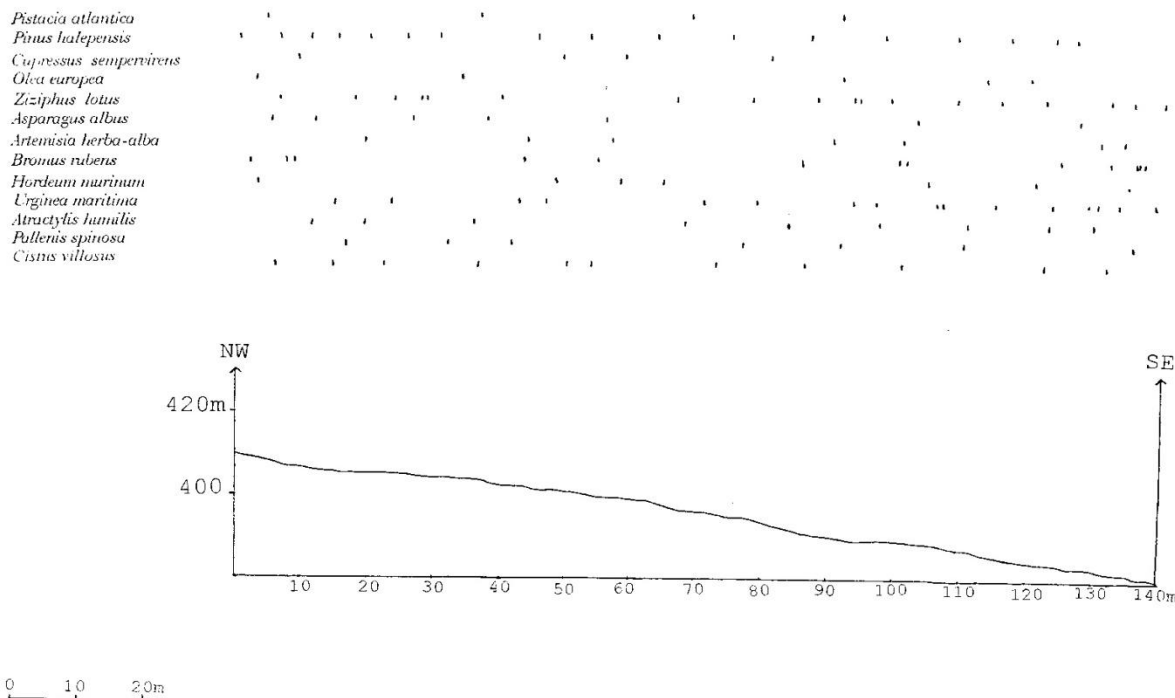


Figure 2: Floristic distribution on line of 140 meters (Station 1)

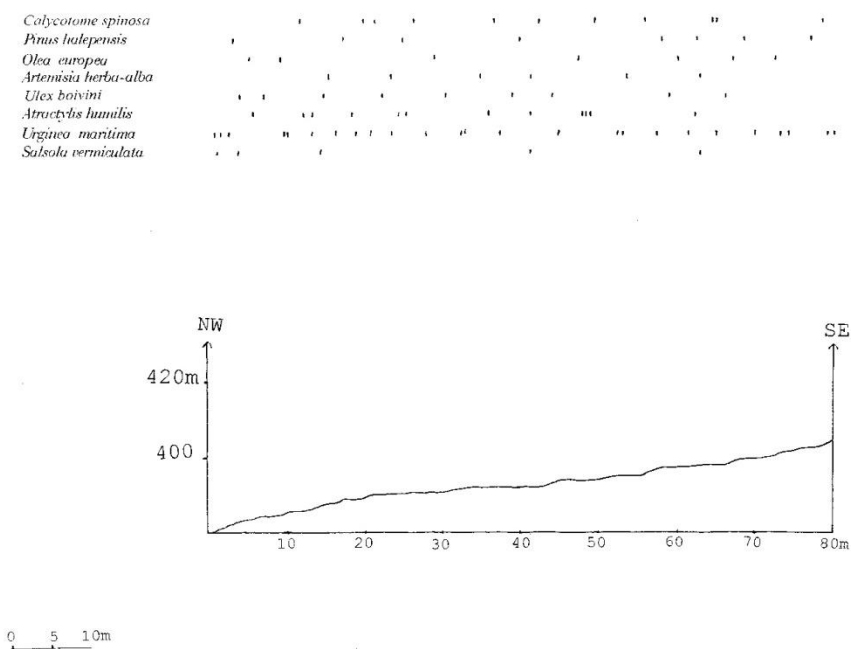


Figure 3: Floristic distribution on line of 80 meters (Station 2)

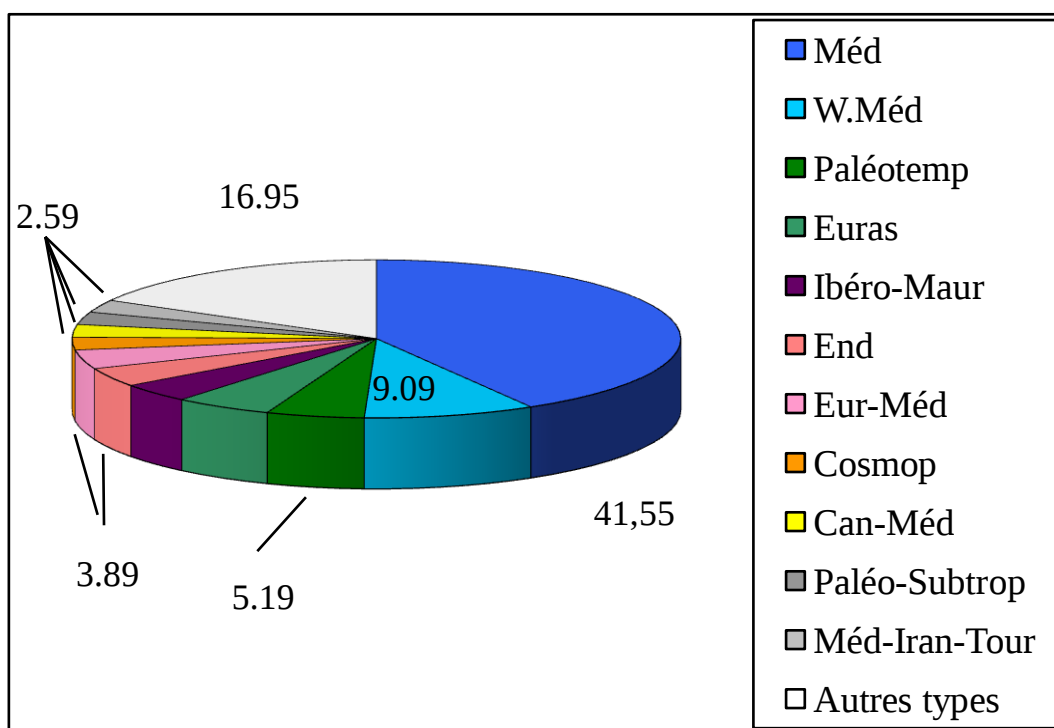


Figure 4 : Percentage of different biogeographical types of species found in our station

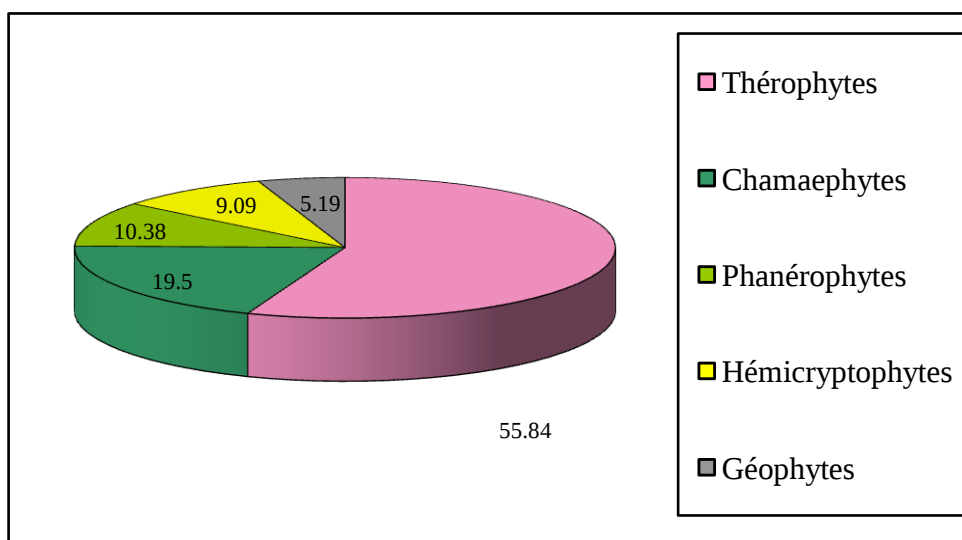


Figure 5 : Percentage of different biological types of species found in our research area



Photo 1 : Example of human made parcel

- Disappearance of trees
- Presence of the *Ziziphus lotus*, *Asparagus acutifolius*
- Presence of the *Urginea maritima* (overgrazing)



Photo 2: Area cleared

- 1st plan: bare soil
- 2nd plan: Hammam Boughrara dam



Photo 3: Agricultural land on the forest border
Extension of agricultural land at the expense of forest areas

. Phytoecological implications

Flora study (Figures 2, 3, 4 and 5)

- The distribution of species by phytogeographical elements shows a very high percentage of Mediterranean species (41.55%) while the other phytogeographic elements are poorly represented.

- For biological types, we see the dominance of therophytes (55.84%) because of the frequent overgrazing and show resistance to dry periods at high temperatures. We also have a good representation of chamaephytes (19.5%) as they are well adapted to aridity. The phanerophytes and hemicryptophytes respectively 10.38% and 9.09% and the first of which generally represent the tree layer. Geophytes are represented by *Asparagus*, *Asphodelus* and *Urginea*.

Several key points can be drawn from the floristic study There is a remarkable presence of species usually considered indicative of the pressure anthropozoogene as: *Urginea maritima*, *Atractylis humilis*, *Calycotome spinosa* ... ect The presence of *Asphodelus microcarpus* reports overgrazing. According Gaouar (1991) "it's a sign of ultimate degradation by cattle." The proportion of trees we also note that decreases while the grass is growing, it is one of the consequences of clearing (El Hai, 1974). The human intervention can range from a partial and purely quantitative change to a fundamental transformation of both quantitative and qualitative. In our area the appearance of steppe species like *Artemisia herba-alba* is caused by drought, Benabadji (1988) noted that in general, the *Artemisia herba-alba* develops in areas where annual rainfall ranges between 100 and 300 mm. This confirms the continuing evolution of the forest steppe.

Soil Study (Table 1)

The soils in our area are loamy texture. These are light soils (clay percentage below 25%). It is well to note our results after the effect of the slope, the more it is emphasized and the flow of water is accelerated, the soil particles will be entrained towards the lower part of the slope and also nutrients. Almost all authors agree that the longer the slope is steep erosion is more important. Note that the soil at the bottom of the slopes are the richest in fines (clays), this may be the result of an oblique leaching, a simple comparison between the sample 1 and sample 2 and 4 and 5 shows the poverty and the latter for nutrient elements. According Greco (1966) "The oblique leaching or erosion hidden on the slopes causes a layering of soils depleted in fines on the heights, enriched the contrary at the foot of the slopes." It also notes that a type of erosion is favored by the silty texture if it contains less than 15% clay, is the diffuse erosion that can occur even on slopes of less than 5%. At the Bled Chahba forest, vegetation cover seems to be a major factor, it has an essential role on erosion. A covered any will be much more effective as it absorbs the kinetic energy of raindrops and it covers a greater proportion of the ground during the most aggressive periods of the year. Lal (1990) in Robert (1996) noted that the probability of erosion will become very important when you have both at least two of the three risk factors: deforestation, unstable structure and steepness.

If in our region, the extension of agricultural land seems to be at the expense of forest land (land clearing) and an extensive breeding that has resulted in the degradation of the soil and preventing any possible regeneration, this may only lead to an acceleration the erosion process due to the degradation of the vegetation cover.

Conclusion

Phytoecological the character of an area, can not be a reflection of the surrounding conditions. The high human pressure on our area had a negative impact on the natural environment. We can say that our forest area is more than ever threatened by the combination of factors including the proximity to the urban area (agglomeration capital of Hammam Boughrara), which only increases the offenses committed in this space . Adding to that the various negative impacts sudden judged during the construction of the dam Hammam Boughrara, and the redevelopment of the roads. It is also certain that a strictly environmental approach could be a suitable solution, since human socio-economic needs can not be ignored, a balance between these two aspects are necessarily imposed keeping in view the preservation of natural heritage is a basic requirement for human survival.

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