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Hamza Ayari

Electronic version

URL: <https://journals.openedition.org/rga/5515>

DOI: 10.4000/rga.5515

ISSN: 1760-7426

This article is a translation of:

Les écosystèmes des montagnes du Haut Tell friguien occidental : dynamique de la population et
friches - URL : <https://journals.openedition.org/rga/5473> [fr]

Publisher:

Association pour la diffusion de la recherche alpine, UGA Éditions/Université Grenoble Alpes

Electronic reference

Hamza Ayari, "The Mountainous Ecosystems of the Western Frigian High Tell in Tunisia: Dynamics of
the Population and Wastelands", *Journal of Alpine Research | Revue de géographie alpine* [Online],
107-1 | 2019, Online since 06 April 2019, connection on 08 December 2022. URL: <http://journals.openedition.org/rga/5515> ; DOI: <https://doi.org/10.4000/rga.5515>

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The Mountainous Ecosystems of the Western Frigian High Tell in Tunisia: Dynamics of the Population and Wastelands

Hamza Ayari

Introduction

- 1 The region of High Tell in North West Tunisia consists of small and medium-sized mountains covered with Aleppo pine forests, separated by narrow cereal plains. Throughout the XXth century, the region had witnessed various changes of its land-use systems and of the mountain population relation to their milieu, which shaped its landscapes. To ensure their subsistence, mountain peasants, who in their majority, were landless and small farmers, had overexploited these fragile Mediterranean mountain- ecosystems (Boudy 1948, Poncet 1961). Land clearing which represented a principal effect of this type of pressure, had scattered the forests' surfaces forming a mosaic of landscapes where natural vegetation and farmlands alternated. This paper will examine the spatial dynamics of the installation of the population and their agricultural activities in the region of *Friga*. The study will also analyze the way the transformations of these dynamics have resulted in forms of abandonment, and it will, finally, discuss the impacts of these transformations on the environment and the types of tenure of these wastelands.

Map 1: Map of the localization of the Western Frigian High Tell

Source: Ayari H., 2016. "Rural development and dynamics of the vegetation in Western Frigian High Tell". A Dissertation submitted to FSHS, Tunis in Geography in the partial fulfillment for a degree of Doctor of Philosophy.

Dynamics of population and land use during the colonial period

A concentration of the population on the slopes after the agricultural colonization in the plains

- 2 After the installation of French colonists and Italian migrants in the narrow cereal plains of High Tell, most of the native population constituted of small farmers or sharecroppers, was folded on the slopes (Timoumi 1999, Poncet 1961). The densities of the mountain population have increased with an increase of transhumance from the central and southern parts of Tunisia and of Algerian refugees, especially during the National Liberation War (1954-1962). A competition for land emerged as a result of the intense movement of clearing. This poor population obtained most of its income from activities exerting strong pressure on the forest (Boudy, 1948), especially through illegal coal-mining and goat herding-. These activities exceed the real potentialities of the local mountainous ecosystems despite the severe character of the colonial forest code which led to a confrontational relationship with the colonial forest administration. In several areas, the farmers grafted the oleaster around their small farms or their *douars*¹ in order to win lands at the expense of the forest as in the case of the slopes in the south of *j².Fekret, j.Touila, j.Kebouch, around Hzim and in Weljet Sedra.*

An important movement of deforestation of forest formations in the mountainous lands

- 3 By the early years of the colonial period, many forest lands, as in the northern slope of *Dyr El Kef* had been deforested by sharecropping with transhumants who were

originally from Makthar. The cut wood was -processed into charcoal or sold for domestic use in the city of El Kef.

- 4 The lack of farmlands in the plains incited even the French settlers to practice deforestation at the expense of the native pastoral space of the maquis of oleolentisque on thick marly soils suitable for cereal cultivation, locally known as “*haryas*”. The French settlers’ deforestation was characterized by the importance of its expanse compared to the one caused by the native population. This concerned essentially the areas of *j.Nadhor*, *Mtarih* and the heights of *Dyr El Kef*. Many native groups were forced to retreat to the margins of these deforested areas. The reduction of pastures was a main reason behind many territorial disputes over the lands between the different *douars* of *j.Nadhor* and *j.Essif*.
- 5 Deforestation or land clearing reached its peak during the transitional period between the withdrawal of the colonial forest administration and the establishment of the Tunisian independent state. During this period (1954-1956) deforestation occurred fast, at raid-like pace using voluntary forest fire followed by an instant plowing labor to assert ownership. Argoob Ghezel along with other forest areas in High Tell, such as the forest of Kessra are examples of this type of deforestation (Gammar, 1979).

A strong degradation of the mountainous ecosystems

- 6 The degradation of these vulnerable *Tellian* southern Mediterranean ecosystems due to the concentration of the poor population on the slopes had been subsequently accentuated by the intensification and the acceleration of deforestation (Poncet 1973). Forest vegetation was the most affected component by this degradation. In fact, the topographic map of *État-Major* shows a dominance of secondary and/or substitutional woody formations following a *mattoralization*³ process which concerned, in many cases, an entire mountainous forest, such as the case of *j.Kebouch*. Apart from the sub-humid bioclimate areas, which are quite rainy –and in comparison to the rest of the Western Frigian High Tell, the *matorrals* dominated the mountainous lands. The vegetal formations of the sectors with hard soils, gypsums or karst and crust soils were dominated by thymelated⁴ and xerophyte⁵ formations that had substituted the Aleppo pine forests, such as the one of *Zatria* (which took its name from the Arabic word for thyme’s *matorral*). In the relatively watered highlands of the superior semi-arid bioclimate, the formations of *dyss*⁶ and *asphodel* substituted the wood.
- 7 In absence of erosion control, the erosive dynamics was accelerated by shrinking forest cover on thick marly soils. The marly ravines expanded. Landslides multiplied. On several highland sites, notably at *Dyr El Kef*, *Sarkuna* and *Oueljet Essedra*, the rocky substratum outcropped on bare elevated plates, a common or recurrent phenomenon in many mountains in Maghreb, such as *Tebessa Mounts* in Algeria.

Rural deprise and the apparition of abandonment forms in the mountainous lands

Confiscation and reforestation: the trigger of the first waves of exodus and fallows' apparition

- 8 At the beginning of the independence, the Tunisian State set a major challenge to reconstitute the losses of the forest cover and to restore the Tellain vulnerable and densely populated ecosystems. It was too difficult to realize these goals on a vital land of a poor population. To mitigate the tensions inherited since the colonial era with this population, the state adopted a conservation policy that took into account substituting the incomes that the population used to earn out of the territories that were affected by these interventions. This policy consisted of launching DRS managements (defense and restoration of water and soils) in partnership with some international programs. A major reforestation had been launched with many types of amenities, in particular infiltration benches created to receive new plantations (Poncet, 1973). They were carried out through projects combating underdevelopment problem and employing vast numbers of the mountain population, especially in the mountains of Nibber and around Kebouch and Maiza mountains, which have been reforested since the late fifties.
- 9 For many people, the conservation programs are the cause of many significant difficulties due to the shrinking of the pastoral areas and other constraints that prohibited their mostly illicit subsistence activities. The magnitude of the deforestation forced the Tunisian state to confiscate the cleared lands. This was carried out cautiously to mitigate the effects of its policy on the poor population. The confiscations thus have focused primarily on the land newly cleared. The state has also sought forms of compromise with the population concerned, to avoid conflictual reactions similar to the ones that occurred over J.Mansour Mountain⁷. Indeed, several plots were rented to their farmers at ridiculous amounts. Others were not involved in the confiscation, but the cases of plots ownership that were cleared by the operators were rare⁸. Several operators have abandoned these plots. The first generation of these wastelands concerned lands located in isolated areas from water points and from principal paths such as the case in the west of j.Essif, or located on sites of poor accessibility such as the case of El Gnater's glaze in the southern slope of j.Hdida. In several cases, the abandonment of lands was not followed by an exodus to towns, but rather a redistribution of the population on the slopes which were located in less isolated areas.

Map 2: Dynamics of population and land use in Argoob Ghezal

Source: Ayari H., 2016. "Rural development and dynamics of the vegetation in Western Friguen High Tell". A Dissertation submitted to FSHS, Tunis in Geography in the partial fulfillment for a degree of Doctor of Philosophy.

The under-equipment and the appearance of the second wave of exodus and land abandonment

- 10 Since the end of the eighties, the persistence of underequipment of mountainous lands and the decline of "the fighting against underdevelopment works" have accentuated the exodus waves to the settlements of basic services⁹ created in the plains and around the roads (M'hidhi 1998). Many farmers have left their clearings permanently. The farms they abandoned, were integrated into the forest estate and transformed into wasteland. Contrarily to the wasteland of the previous generation, the clearings and the wastelands were rarely reforested. For example, in the north of Kebouch's wood or in the southern slope of j.Fekret, the abandoned small clearings that were planted with olive trees were reforested with Aleppo pines. On the contrary, in the mounts of Wargha, the abandoned clearings were not affected by reforestation despite the departure of their inhabitants because of the narrowness of their surfaces. Around j.Chams, the departure of Algerian refugees after the independence of their country in 1962 led to the abandonment of the lands that they occupied.

Map 3: Rural exodus flux in the north of Dyr El Kef

Source: Ayari H., 2016. "Rural development and dynamics of the vegetation in Western Friguen High Tell". A Dissertation submitted to FSHS, Tunis in Geography in the partial fulfillment for a degree of Doctor of Philosophy.

- 11 In other sectors of High Tell, entire villages have been deserted such as the case of mount Bargou where the *dachras*¹⁰ of B'hirine, Maioula and Sidi Mtir witnessed a displacement of their population towards Wadi Bousaadia corridor to get closer to the basic services installed near the roads (Auclair, 2005). These movements of population from several isolated villages in the western High Atlas were followed by a transformation of olive trees farms to brushwood and an abandonment of the managements and terraces, in the majority of cases

Map 4: Abandonment of many clearings in j.Kebouch, following the displacement of the mountainous population to the commune of Bahra resulted in their transformation to wastelands then reconquered by forest vegetation

Source: Ayari H., 2016. "Rural development and dynamics of the vegetation in Western Frigien High Tell". A Dissertation submitted to FSHS, Tunis in Geography in the partial fulfillment for a degree of Doctor of Philosophy.

The recent wastelands

- 12 A third wave of rural exodus began in the late eighties. The rhythm of the later was different under the impact of many factors among which we specifically cite the launching of the program of degourbification¹¹. This program required the ownership of a plot of land designed for building by anyone who wanted to benefit from the public funding to construct a house with cement. The complexity of the land tenure status and the absence of ownership titles on clearings and the deforested surfaces incited an important mass of the mountainous population to buy small plots around the local small towns. The rural exodus has also been intensified by the adverse impacts of the 1980 drought on livestock, which became the main source of income after the decline of the projects of fighting against underdevelopment. The majority of the mountainous population left the *douars* towards the towns.

Table 1: The dynamics of population's installation in the north of Dyr El Kef during the period 1980-2018 according to the data collected from the socio-economic surveys and interviews conducted by the author

Douar	Number of households in 1980	Number of households in 2018	Balance sheet	Rate of displaced households to towns (in %)	Destinations
High Nahor	12	2	-10	83,3	Nibber, Kef
Low Nadhor	13	0	-13	100	Nibberr, Kef, Twiref
Kebrita	9	2	-7	77,7	Nibber, Kef
Argoob Regig	6	1	-5	83,3	Nibber
Argoob Ghezal	11	2	-9	81,8	Nibber, Kef, Mahassen
Jimla	5	0	-5	100	Nebeur
Khwairia	7	0	-7	100	Melleg, Kef
Abidda	17	4	-13	76,4	Nibber

- 13 Unlike those of the two precedent generations, the wastelands of this generation are not limited to forest clearings. During this wave, the mechanization of the agricultural labors played a key role in the dynamics of the agricultural land use and in the crop rotation. The inaccessible lands to mechanical equipment were abandoned even by the people who resisted the rural exodus. This abandonment is partially explained by the lack of familial labor necessary for the hard traditional agricultural work, following the emigration of the youth to the coastal towns of Tunisia. It became noticeable that the accessible lands to combine harvester were cultivated in wheat while the lands accessible only to tractors were cultivated in barley designed to pastoral purpose and known locally as “*gsil*”¹² or designed to plowed fallow¹³.
- 14 In the 21th century, an inverse movement of rehabilitation of the abandoned wastelands following the confiscation of clearings started. In cases such as those of Taref and the north of j.Hdida, the exploitation of theses narrow surfaces found legitimacy in the judicial rules of the land tenure status of the land conflicts between the population and the forest administration. In many other cases, small areas located in wastelands that were conquered by forest vegetation were brushed off. The reclaimed areas were essentially planted *Arbequinã*¹⁴ olive trees of Catalanian provenance following a remarkable rise in olive oil prices' since 2006.

Photo 1: Reclaimed wastelands after elimination of scree and creation of dry benches in the north of Dyr El Kef

The accessible lands to combine harvesters are cultivated in wheat (in green). In the bottom, the lands accessible only to tractors are cultivated in barely or used as plowed fallow.

Photo H. Ayari, December 2013.

The impacts of wastelands on the asserting methods and ecosystems

The new operating relationships and dynamics of wastelands

- 15 The towns of High Tell that received the mountainous populations are characterized by high rates of unemployment. The difficulties that the unemployed population encountered had an influence on their relations with the farms they left. How did these emigrants stay attached to their lands and how did they manage these lands?
- 16 The Agricultural lands near the towns where they settled were still exploited by migrants, mostly with an arboreal or pastoral vocation. The lands with arboreal vocation were plowed every year even if maintenance was rare and limited to rehabilitation of basins or infiltration benches. Lands with pastoral vocation remained in wasteland and were frequented by small flocks as forest pastures.
- 17 In contrast, the distant agricultural lands were exploited by relatives of migrants who did not leave their native *douars*. With the accentuation of rural exodus, modes of indirect tenure between land owners and operators to whom they delegated the conduct of their crops became dominant. Initially, cereal lands were leased against 1/3 of the final harvest for the urban owners of mechanical agricultural gear or machinery. Later on, the land owners began renting cereal land to small owners in exchange for their debts. Many factors are behind the emergency of this kind of exploitative

relations that promote an urban grip on the property of old peasants descended from the mountains (Sethom, 1992). The causes are essentially the inability of this category of land owners to finance the farm work when they had other social expenses, such as the costs of schooling of their children¹⁵ combined to the difficulty of finding of resources to improve their income in local towns.

- 18 Lands that were inaccessible to mechanic machinery were transformed to wastelands after they were permanently abandoned. They were transformed into uncultivated lands called “jendel”¹⁶ in the local dialect. In many cases, these were the legitimate descendants of farmers who used to finance the agricultural work of their families in order to escape the indebtedness to owners of the agricultural gear or machinery.
- 19 While mechanization led to the abandonment of several agricultural lands in which most common tools can not be used, the introduction of more sophisticated equipment allowed the extension of several farms. Heavy gear, and polydisc plows were used to crush scabs on hard substrate soils and the management of bowls or basins for planting olive trees (Makhlouf, 1968).
- 20 Accordingly, several areas were transformed into arable lands by a human effort. This consisted of removing screes and small stones of the pastoral surfaces in the heights of Sarkoona and DyrEl Kef. The amassed screes were used in the construction of dry benches. The development of these surfaces prompted some peasants to practice grafting of hawthorn trees in pear trees in Sarkoona. The change in the nature of lands that used to be untillible or uncultivable was made at the expense of the dynamics and good balance of the natural ecosystems.

Photo 2: Reclamation of abandoned wastelands though the usage of polidisc plows (in the center of the photo)

Photo H. Ayari, April 2017.

- 21 Attempts to cultivate the abandoned wastelands have been observed recently. Near the village of Taref, many bushes with olive trees from the grafting of oleaster experienced in a first step a clear-cut of their woody vegetation followed by a deep plowing the following years. Their olive trees have been trimmed again and have therefore resumed their usual physiognomy. These brushing actions which were issues of conflicts

between forest administration and the people of the village were performed cautiously before the 2011 revolution. They have thereafter extended to the pastures of much degraded vegetation. Note that the majority of the dropouts of olive trees in the High Tell are related to confiscation by the State, while on the other side of the border, as in Algeria, the wastelands with olive trees are more commonly the result of voluntary abandonment drop mainly on the mountains located in the north of Galma and Souk Ahras governorates.

Map 5: The sector of Taref shows an importance of the phenomenon of development of the confiscated olive trees (in hatched yellow) and uncultivated lands (in dotted green)

Source: Ayari H., 2016. "Rural development and dynamics of the vegetation in Western Frigien High Tell". A Dissertation submitted to FSHS, Tunis in Geography in the partial fulfillment for a degree of Doctor of Philosophy.

The environmental dynamics on the wastelands and fallows

- 22 The sequence of the rural abandonment and the abandonment of lands in a series of periods of different nature has had impacts on the ecosystems. It has had, particularly affected vegetation and soils. They are the elements of the mountainous environments that are affected the most by the various forms of pressure exerted by the population as in all the mountains of Maghreb (Sari, 1977; Benchetrit, 1956). Accordingly, we wonder on the one hand what were the interactions between the population and environment during each historical phase of agricultural abandonment and wastelands' exploitation, on the other hand what were the tendential effects on the dynamics of the population and the environment of the succession of these periods when each of them was marked by special conditions?

- 23 First, a distinction should be made between wastelands located in the forest clearings and the wastelands located in cereal land or in pastures. The cereal wastelands located on muddy and clay high soils or ground covered with scree were pervaded by herbaceous ermes staked by hawthorn and dense in places as in the case in the north of Dyr El Kef. On the lower lands of Wadi Melleg corridor, they are invaded mainly by deeply-rooted species that are resistant to grazing by the teeth of livestock, essentially balls of *pistacia lentiscus* or *zuzuphys lotus*¹⁷. Hard substrates, however, are permeated by thymes and spiny green¹⁸ weed as is the case in the corridor of Wedien El Glaa, Zaatria and on the northern slope of j.Kebouch.
- 24 This vegetation of wastelands resulting from an abandonment of cereal lands includes several cultivated products exploited for a long time by the mountainous population, in particular *atractylis gommifera*¹⁹ in Dyr El Kef and *cynara cardunculus*²⁰ (Beniston 1984). The latter is a one of the sources of income for the population in the forest clearings of Wargha Mountains and of the periphery of j.Kebouch from November to April. The maturity of Aleppo pine plantations on confiscated lands offers important resources of zgoogoo²¹ to the mountain population as is the case in Argoob Ghezal, j.Essif and j.Kebouch.
- 25 These are the wastelands located in the forest clearings that have undergone the most profound changes due to their isolation and their low attendance by the livestock, which helps the recovery of the forested vegetation. The balls of *pistacia lentiscus* dominate the landscape of the clearings with thick marly soils with several other species. On wastelands with hard surface which are often rendzines or crusted land planted with olive trees, diversified forest vegetation has invaded the clearings. In the lands drained by streams or of sub-humid bioclimate, mainly in Takroona and Ain Mazer, we find a riparian vegetation of *inula viscosa*²² and brambles that permeated the wastelands.

Photo 3: abandoned forest clearings transformed to "jendel" in Takrouna in Wargha Mountains

Photo H. Ayari, Mai 2008.

- 26 The density and floristic diversity of wastelands depends on the bioclimatic abilities and the date of abandonment. In the semi-arid lower bioclimate which corresponds to Wadi Melleg corridor, the first generation of abandoned wastelands following a confiscation or because of the isolation is covered with red juniper and Aleppo pine trees with an underwood consisting of rosemary and *Alfa*²³. In many cases, the wasteland still keep their olive trees around the traces of abandoned houses as is the case on the periphery of Melleg reservoir which construction in 1954 surrounded the *douars* and the clearings. Generally, the wastelands are distinguishable in the forest landscape even in the most isolated places. In many cases, the dynamics of the vegetation are blocked and encounter difficulties related in part to recurring hunts by wild boars who often attend these wastelands in search of bulbs and rhizomes.
- 27 In contrast, at the upper bioclimatic layer, the wastelands of the first generation are dominated by brushwood. They are integrated in the forest landscape and are difficult to be distinguish from their edges. . In the semi-arid upper bioclimatic layer , they are distinguishable on the sunny slopes as is the case south of j.Hdida where a continuous layer of rosemary has colonized the lines of the last plowing, forming a landscape similar to Lavender fields in Provence. On the heights in semi-arid upper and sub-humid bioclimates, they are covered with forest formations indexed by green oak and hawthorn. In the sub-humid layer, they are covered with brambles and riparian species especially *inula viscosa* in addition to the forest species.

Photo 4: In the foreground, forest clearing abandoned in the sixties years and reconquered by a slick rosemary south of j.Hdida. In the center if the photo, clearings confiscated and reforested by Aleppo pine's

Photo H. Ayari, September 2008.

- 28 The second generation of wastelands, from the rural abandonment of the eighties has also witnessed a recovery of the vegetation. Outside the forest areas, it is invaded by asphodel formations that constituted kawns on the heights of Dyr El Kef and pioneering species which form *matorrals* of rosemary and rockrose Montpellier in the bordure of forests. This last nitrophilic species is evidence of a high frequentation by livestock in the past. In the forest clearings, this generation is invaded essentially by *capparis spinosa* and *pistacia lentiscus*, and by green oak on the heights of upper semi-arid and sub-humid bioclimates.
- 29 The recent generation of wastelands, abandoned in the late eighties due to the drought of 1988, concerns very limited surfaces located most often on the immediate periphery of the habitats. These wastelands covered by herbaceous plats show signs of vegetal recovery. Despite the significant importance of the rural-urban migration, the abandonment of the lands of this wastelands' generation was quickly followed by a movement of the exploitation of the cereal lands by urban tenants due to the creation of several tracks.
- 30 The impacts of the rural abandonment on soils and managements are important in some places. Indeed, the soils of many arboreal clearings are gullied. Their managements are damaged; this is especially for the dry benches that have been covered by sediments. Several trails have been erased by the gully water or by the clay flows carried in scree blocks from the high slopes as in in the area of El Gattar in the north of Dyr El Kef. The destruction of several tails in the areas of Takrouna and Ain Mazer has isolated several clearings. Other plannings that require collective efforts has been damaged as a result of the significant decrease in the densities of the mountain

population as is the case of the clogged sources located on the periphery of the wastelands.

Conclusion

- 31 The wastelands, resulting in their majority from a movement of deforestation carried out by the displaced population to the slopes during the colonial period, experienced a gradual abandonment in parallel with a reverse postcolonial movement to plains because of the under-equipment of the mountainous areas in the Tunisian High Tell and because of the complexity of the land lease regulations. The continuous rural decline in the mountainous lands has resulted in the dominance of absentee exploitation relations, strongly influenced by mechanization of agricultural work. The latter has played a selective role in the dynamics of the land use by the abandonment of the inaccessible lands and by transforming them to wastelands. In the forest clearings, the levels of plant recovery and the integration of wastelands in the forest landscape depend on the chronology of abandonment and local bioclimatic aptitude. Despite the adverse environmental impacts on their soils and the destruction of their managements thereof, the wastelands have not lost their economic potential. On the contrary, they have shown new vocations besides those associated with livestock, especially harvesting activities which play a key role in the increase of the mountain population's incomes.

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NOTES

1. Elementary unit of grouped population less than the size of a village
2. « j » abbreviation of *jabal* : mountain in Arabic dialect
3. The *mattoralization* is the degradation of the Mediterranean forest to secondary wood formations.
4. The *thymealous* are low formations dominated by thyme that succeeded to the degradation of Aleppo pine's forest on hard floors areas.
5. Thorny vegetation consists mainly of thorny greenwood, of *oxycedar juniper* and pads of oleaster.
6. *Dyss*, *ampelodesma mauritanicum*, is a grass used to the nutrition of the cattle and the equine as well as for the coverage of the stable's roofs.

7. The history of Tunisia is marked by a number of confrontations with the mountainous population, in the case of j.Mansour, the uprising of the populations against the transfer of their confiscated lands to French settlers was sanctioned by an armed repression by the colonial authorities.
8. In Kessra forest, the state has authorized only ownership of deforested area made before 1956.
9. Since the late Seventies, the Tunisian state created settlements of population known as “malajis” in order to collect the people around the elementary services, especially primary schools.
10. Mountainous village installed on a karst source
11. The of eradication of rudimentary cottages had intended to substitute the habitation built in soil by solid constructions
12. The “*gsil*” is a phenological stage of barely before the rise in seed during which the pasture improves the tillering. The *gsil* period extend from January to the beginning of March. After this period, barely takes its growth to be harvested at the end of the month of May.
13. The plowed follow is a practice introduced by the French colons settlers. It is used to a deep spring labor after which the ground constitutes a water reserve that allows the germination and the growth of grass in autumn.
14. The *Arbeqinā* variety is preferred to local varieties for its early fruiting stage, three years after planting (its life can not exceed 25 years).
15. The farming work start after the school return. To be able to buy treated seeds and chemical fertilizers at the Office of Cereals, organism which was privatized, the peasants are indebted to the owners of agricultural mechanical equipment.
16. The “*jendel*” is a plowed field transformed to fallow. It is generally covered by pioneer or thorny vegetation uneatable by the livestock.
17. The jujube or *zuzuphys lotus* is a very thorny woody species that colonizes deep soils. Its eradication is extremely difficult because of its deep roots. It held important surfaces before the introduction of polydisc plows by agrarian colonization.
18. The spiny green is or *calycotome villosa* is very thorny woody Mediterranean species. It is characteristic of several wastelands frequented by the livestock. Its ears protect it against grazing by cattle’s teeth.
19. *Atractylis gommifera* is a perennial. Its roots are used as incense after their drying.
20. Wild thistle or *cynara cardunculus* is a very thorny herbaceous that colonizes the lands with deep soils. It is picked by the population of Wargha Mountains for its marketing as edible plant.
21. Sweet seeds of Aleppo pine. Their extract is used with flour for the preparation of a kind of cream known as “*assidet zgougou*”.
22. *Inula viscosa* is riparian specie that colonizes the wetlands.
23. The *Alfa, stipe tenacissima*, is a steppe grass with coiled and leathery leaves used in the making of mats and several handicrafts in the Maghreb and in Spain.

ABSTRACTS

Wastelands, a feature that has prevailed predominately in the mountainous landscapes of the Tunisian High Tell in 2018, has been a source of conflicts between the residents and the forestall administration in the colonial and the national period since the end of the 19th century.

Wastelands represent remaining ecological footprints on the landscapes of the Mediterranean hinterland due to the different forms of pressure on the forest ecosystems related to the population dynamics. Since the 19th century, the succession of the political and economic contexts has impelled the mountains population into movements of installations and waves of deforestation at high altitudes during their dislocation by the agrarian colonization, then in plains with equipment can only provide basic services. This fieldwork was guided by two questions:

Did the abandonment, which led to land clearing, promote forest regeneration?

Did the absentees' ways of exploitation accelerate deforestation and erosion?

It seems that the evolution of the wastelands has followed different paths in function based on the chronological abandonment and bioclimatic aptitudes of the ecosystems.

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Keywords: Tunisian High Tell, wastelands, rural abandonment, land use, environmental dynamics

AUTHOR

HAMZA AYARI

PhD. Faculté des Sciences Humaines et Sociales de Tunis. Université de Tunis.
ayari.hamza@yahoo.fr