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# Way of Life and Technical Knowledge of Moroccan Charcoal Burners: an Ethnoarchaeological Approach (Gharb and Middle Atlas Morocco)

Sylvain Burri, Aline Durand, Mohamed Alilou

## Abstract

In Western countries, the ways of life of forest artisans have left very few traces, either in the earth or in archives. The mobility of these persons, the fact that their activity was dependent upon the cycle of regeneration of the plant cover and their marginalization provide an explanation. The use of ethnoarchaeological sources is thus vital to guide the textual and archaeological interpretation (ACOVITSIOTI-HAMEAU 1995; FABRE 1996; LUGLI, PRACCHIA 1995; MUSSET 1996). This ethnoarchaeological approach helps the archaeologist to discover, identify and interpret the structures that he finds. From this standpoint, the study of post-depositional processes is necessary to better conduct archaeological excavation and better understand the series of operations that occurred and the associated technical actions.

The Moroccan countryside today is a veritable repository of traditional ways of life and technical knowledge in Mediterranean lands, knowledge that has completely disappeared from Western Europe. This is particularly the case for the production of charcoal in the eucalyptus forests of the plain of Mârmora and in the evergreen oak forests of the Middle Atlas, studied in 2008 and 2009 (Fig. 1). In the latter case, the biogeographic and topographic situation is identical to that of the medieval sites for charcoal production being excavated in lower Provence.

KEYWORDS: *Ethnoarchaeology, Post-Depositional Processes, Charcoal Production, Gharb and Middle Atlas, Morocco.*

## I. Typology of Charcoal Production by Rick in Morocco Today

Traditionally, the charcoal burner uses the technique of carbonisation in a rick with a central flue and vent-holes (ACOVITSIOTI-HAMEAU 1995; LUGLI, PRACCHIA 1995). The transmission of this technique is generally from father to son and only exceptionally otherwise. This activity is not officially recognized; the charcoal burner is considered to be a peasant.

### A. Charcoal burning restricted by legislation

In Morocco, the state has become the main owner of wooded areas, and the forestry code regulates their use by declaring periods when exploitation is prohibited because of the risk of fire. The allocation of forest plots for charcoal burning restricts the production (volume, type and cycle) and the spatial and technical organisation.

At Dar Bel Amri (nearby Khemisset), semi-industrial enterprises managing between 40 and 60 simultaneous pyrolyses are specialised in the production of fruit tree charcoal from orchard trees (orange, apple, pear, quince, fig, pomegranate), which they cut, as well as removing the stumps. Each charcoal burner is qualified to carry out all the operations need for the pyrolysis of the wood: cutting up of the wood, construction of the rick, coating, management of the burning and removal of the charcoal produced. Each rick of 40 tons of wood produces 10 tons of charcoal, that is, three times the artisanal production, and the pyrolysis lasts nearly one month. The rick is surrounded by a ditch into which water is poured to increase the humidity of the earth.

The regular production of charcoal in the eucalyptus forests of the plain of Gharb is characterised by a technical series of operations divided into different specialised activities, those of woodcutter, stump remover, rick constructor,

charcoal burner and charcoal transporter. The wood to be carbonised is de-branched, bevel-cut and then stacked, one meter wide by five to ten meters long by a meter in height. The rotation of cutting is ten years maximum. The leaves are kept to coat the ricks, a task always carried out by the charcoal burners, preferably mixed with earth already containing charcoal. The ricks are between 5 and 6 m in diameter and 2.50 m high, that is 50 m<sup>3</sup> of wood. They produce between 700 and 800 kg of charcoal. For reasons of security, they must be situated less than 5 meters from a service road and about 8 meters from the edge of the plot of land. There must be between 5 and 10 meters between two ricks. The plot of land, according to its size, may accommodate between 30 and 90, but only 4 to 10 ricks are burning on a plot at the same time. The pyrolysis lasts about 15 days, the charcoal burner must check it at least twice during the night. The earth used for coating is reused as fertiliser or compacted for fire-lighting.

Charcoal burning practised in the Middle Atlas at altitudes of between 800 and 1800 m is very similar to the traditional way as the charcoal burner carries out the entire technical process in a family or cooperative situation. The wood is mainly evergreen oak, and to a lesser degree orange, olive, carob and jujube, but not juniper, the cutting of which is prohibited. Unlike Gharb, the green or dry wood is always burned with its bark, or it is considered to be of poor quality. Because of the mountain relief, the rick, which takes four days to build, is constructed on an artificially flat area or ledge made of dry stone. Its dimensions are more variable than in the Gharb.

### B. Illegal forms of charcoal burning

Illegal charcoal burning is just as widespread. It is practised occasionally in the forests. Small ricks 2.50 to 3 meters in diameter and about 3 m high are built into the heart of a tree stump. They are often managed by young girls. But some peasants regularly produce charcoal to complement



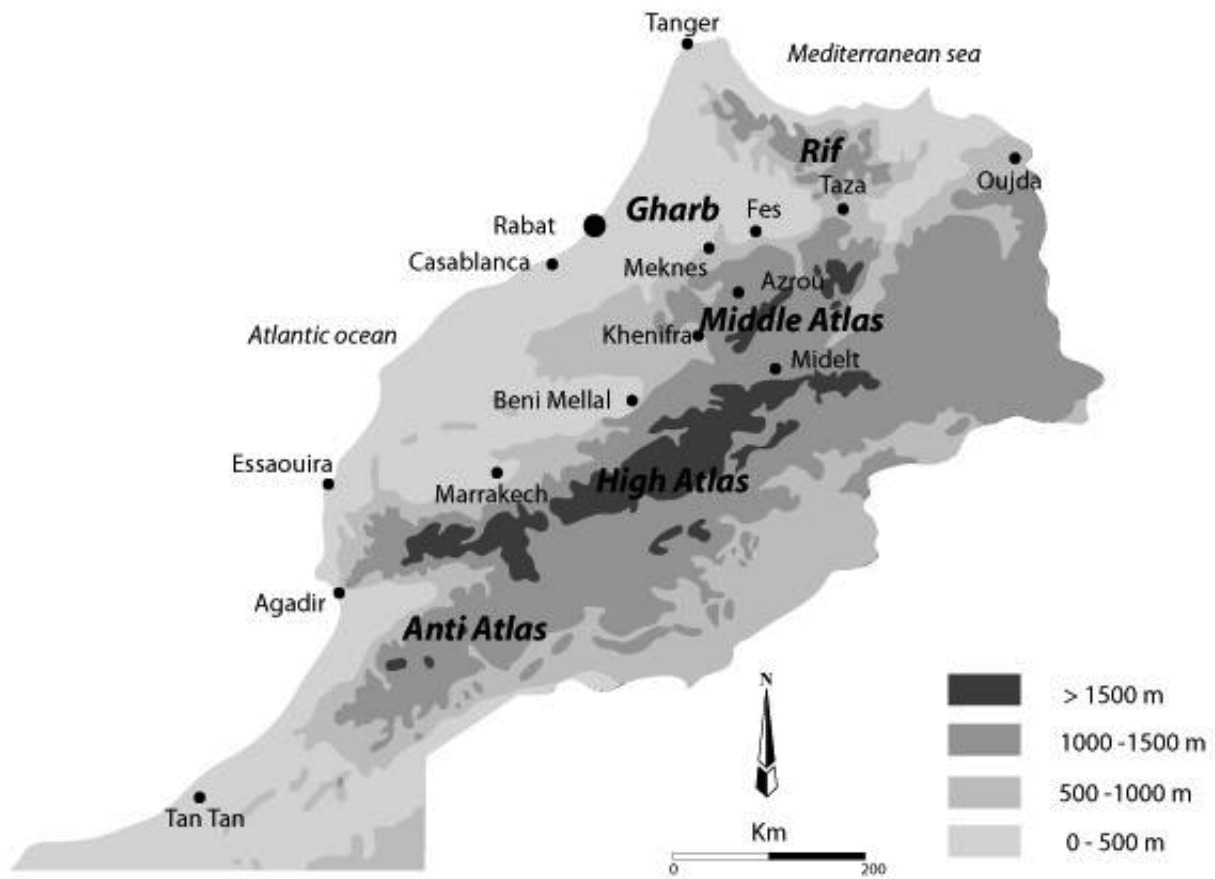


Fig. 1. Location of study areas in Morocco.



Fig. 2. Eucalyptus fresh leaves coating the rick of Ben Aïssa Ben Rabhat. Douar Sidi Sefe (29/09/2009) (N 34° 08' 102'' et W 006° 02' 715'' ± 6 m).

their incomes. This is a sedentary form of charcoal burning organised according to the needs of the market. Far from being marginal, this practice sometimes concerns the whole village, including the women. The clandestine nature of the activity means that only a single small rick (3-4 meters in diameter) is built a few metres from the house. The wood is collected in the nearby eucalyptus forests within a radius of no more than fifteen kilometres. Only the dead wood or the waste from legal cutting is collected, except for some green branches for covering the rick (Fig 2). Another particularity: the presence of a stump placed next to the rick, intended to mitigate the possible collapse of the burning structure, which plays a ritual and prophylactic role. The black earth from repeated carbonisations in the same spot is used as a fertilizer and an additive in the fabrication of manure.

## II. Residential strategies and temporary dwellings

### A. Residential strategies related to charcoal burning

A residential strategy corresponds to each organisation of the work of charcoal burning. The fact that this activity is carried out in a domestic setting, in the forests near a village or farther away, has consequences on the way of life of these artisans, whether itinerant or sedentary. The only case of truly sedentary artisans is that of the industrial charcoal burning of fruit tree wood (Dar bel Amri). The distance between the main residence and the place where the raw material is found determines the choice of a temporary stay or not. In the case of domestic production or in nearby forests, the artisan moves back and forth from residence to resource, either to transform the raw material on the spot or extract it and carry it to the dwelling where it will be transformed. However, in the case of artisanal charcoal burning on a plot that has been allocated, the artisan must stay there during the exploitation time, far from his village (Fig. 3). This situation concerns either a group of associated artisans or artisans accompanied by their wives and children and even their relations and in-laws.

### B. Typology of the encampments and organisation of the domestic space

In the Gharb, the segmentation of the series of operations leads to particular situations. On the same plots of land the encampments of woodcutters, rick builders and charcoal burners succeed each other. Each activity according to its particular requirements creates particular types of encampments. The woodcutting phase requires a high level of manpower, which leads to large encampments made up of several temporary family dwellings which move on as they follow the line of woodcutting. The time needed to construct the rick to burn the charcoal being relatively short, the artisans do not stay overnight but return to their homes each evening. The only traces of their work, besides the rick, are hearths for cooking and tea-making. Unlike the woodcutters, the encampments of the charcoal burners do not include their families. They are made up of artisans working and living together on the same plot. To deal with the production, the artisans move their cabin from one place

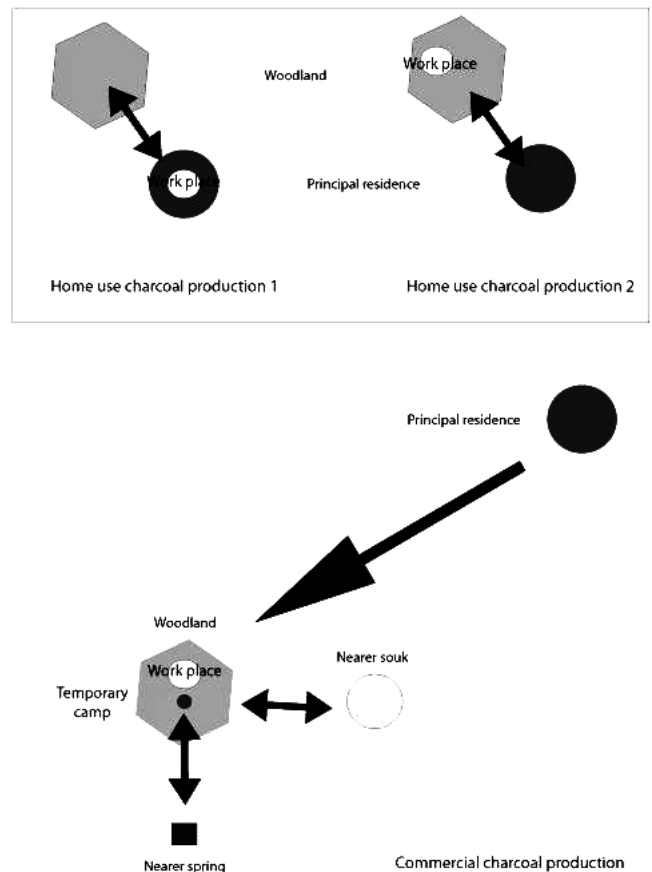


Fig. 3. Residential strategies related to the different kind of charcoal burning.

to another on the plot of land to be as near as possible to the spot where the charcoal is made. They take down their dwelling and transport it to the next spot. This removability is very important for discovering the traces of such structures.

In the Middle Atlas, the distance and the duration of the activity implies the setting up of family encampments which are more or less extensive and complex according to the holder of the allocation and the surface of the plot of land. In the case of large exploitations carried out by charcoal cooperatives, actual village-encampments are created, inhabited by several families. In one of these, a mosque was even constructed during the month of Ramadan. These encampments are located in different areas of the plot of land and are moved to follow the advance of the exploitation.

The temporary dwellings are constructed exclusively in plant materials (wood, branches). They differ in their plan, surface area and manner of construction, but can be related to classical typologies of wooden archaeological and ethnoarchaeological structure of dwelling (CHAPELOT, FOSSIER 1980; EPAUD 2009). For their cabin, the charcoal burners gather dead wood from the plot or reuse wood from the cabins abandoned by the woodcutters. Today, plastic and jute cloth have replaced the plant materials. The choice of manner of construction and of the plan of the structure is not particular to each activity or to each artisan as the same forms are found among the

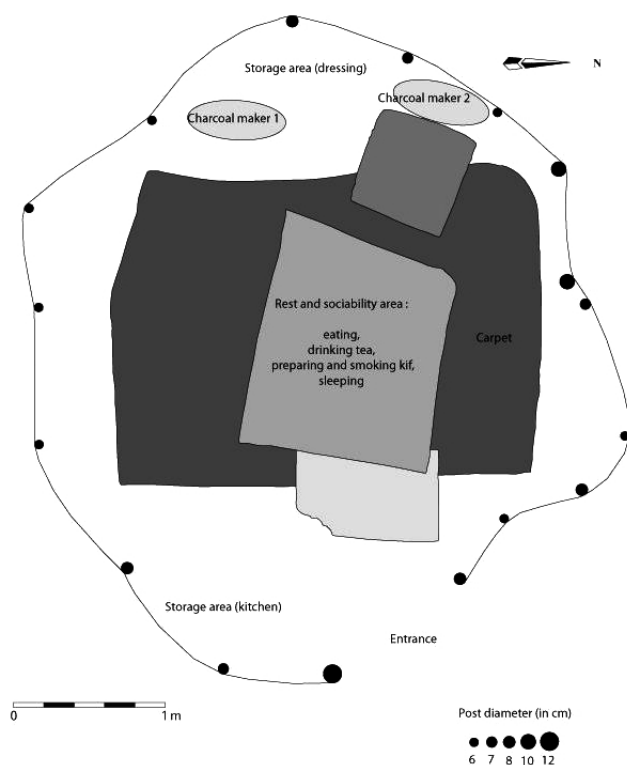


Fig. 4. Temporary hut of the charcoal burners Hassan and Rachid. Sidi Yahya (14/10/2008) (N 34° 17' 060" W 006° 11' 566" ± 6 m).

different activities and the same artisan may produce quite different forms of dwelling. These choices of architecture and habitable surface are dictated above all by the number of occupants and the life duration of the structure.

The first type is a conical structure made of wooden timbers embedded in the ground and joined in a central point at a height of about 1.70 m where they are tied together with a plastic band (Fig. 4). The entrance is 0.90 m wide on average. The covering, made in the past from interlacing branches, is today replaced by plastic tarpaulins covered by a coating of branches and eucalyptus leaves. On the exterior, a roll of earth excavated from around the structure covers the base of the covering to hold it in place. Variations with horizontal beams have been observed.

The second type is a cabin with timbers forming a triangular inclined roof carried by posts and a main roof beam (Fig. 6). Rectangular in plan, these cabins are sometimes flanked by apses. The framework of wood rests on two posts bearing a main beam at a height of about 1.70 m. The structure consists of a series of embedded timbers that are inclined, regularly spaced and tied to the main beam by cloth ties or string. The entrance is formed by two embedded posts and generally measures 0.80 m wide and 1m 40 high. The domestic space is divided into several areas with differing functions. This division is sometimes made by trunks laid horizontally on the ground. An area for sleeping is thus defined, with a bedding of leaves and/or a series of rugs. Near the entrance a zone is designated for

domestic objects. The rest of the space is used for the belongings of each charcoal burner.

Annexes to the dwelling make up the encampment. First there are round hearths for cooking. In bad weather, cooking is carried out under conical shelters of about 1 meter protecting a hearth. In the Middle Atlas, a bread oven completes the domestic equipment. Other structures are for the animals. The encampment is sometimes enclosed by a protective fence made of wood cutting waste.

### C. Study of the post-depositional processes

Observation of what the production sites become after abandonment is as important for the archaeologist as the observation of how they function. The example of the plot at Naour (Province of Beni-Mellal – Middle Atlas) where charcoal was produced by Mouha Baghbou from June to November 2008 (Fig. 5) provides evidence for the impact of anthropic post-depositional processes (removal of construction materials, voluntary destruction...) and/or the natural processes (bioturbations, erosion...) and thus the transience of the remains. The assemblage studied consists of an encampment made up of a temporary dwelling and a bread oven situated halfway up a slope overlooking all the flat areas where the charcoal burning took place.

One year after in the autumn of 2009, the remains of the site had particularly suffered from erosion, because of the slope and the lack of vegetation due to crops planted higher up. Thus the ledges for charcoal burning made of dry stone had become completely gullied. The process of destruction of the encampment was increased by the fact that the artisan had taken away the construction material (wood and plastic covering). Only the bread oven and the excavated ledge for the cabin were still visible (Fig. 6).

### Conclusion

Observation of the types of charcoal production by rick in Morocco reveals that they are becoming industrialised, one of the consequences being the sedentarisation of the artisans. This is accentuated by the fact that the children go to school, breaking the transmission of technical knowledge and the family organisation of the production. These changes that have taken place in the plain of Gharb favour segmentation and specialisation of the metier. The variability of personal situations and modes of organisation of production does not allow a clear picture to emerge. Except for the sector of Mârmora, whether they are irregular or regular producers, the charcoal burners exercise other activities to differing degrees, an aspect that should be stressed. This approach underlines also the transience of the traces left by this type of non-sedentary craft as much for the dwelling as for the structures of production. The rapidity and the impact of the combined effect of the removal of materials, erosion and bioturbations after one year accentuate the difficulty of finding archaeological remains. Complete erasure over time is most probable, indicating that to conclude that productions of this type did not exist because remains are absent would be wrong.



*Fig. 5. Encampment of Mouha Baghbou. Naour (19/10/2008) ( $N32^{\circ} 28' 996'' W 005^{\circ} 50' 560'' \pm 5 m$ ).*



*Fig. 6. Encampment of Mouha Baghbou. Naour (07/10/2009) ( $N32^{\circ} 28' 996'' W 005^{\circ} 50' 560'' \pm 5 m$ ).*

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