

AGAINST THE DESERT IN THE KARST. A PARADIGM-SHIFT FROM RUINED LANDSCAPE TO CULTURAL SAVANNAH

PROTIV PUSTINJE NA KRASU. PREBACIVAJUĆA PARADIGMA IZ RUINIRANOG KRAJOLIKA U KULTURNU SAVANU

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Summary

In questioning the traditional degradationist narrative about the history of the Classical Karst woodland, the article demonstrates the rationality of the forms of use by the peasant population. In the first chapter interpretations about the actors and factors of Karst »deforestation« are presented and discussed. Reducing the subjects responsible for the »destruction of forests« to Venice and the local peasants appears simplistic, since the factors of forest resources consumption were numerous in a pre-industrial economy. In the second chapter the early modern peasants' woodland and pasture land-use system is presented, demonstrating how the Karst inhabitants did not destroy the woods and trees, but used them. Every single tree was there with a specific purpose. In determining their use peasants based on the characteristics of the karstic terrain, the climatic conditions and the experimented vegetative capacity of the species. According to their practical knowledge, they considered that a »real forest« was not economically justified in the Karst. Only the trees necessary to cover domestic and agricultural needs were allowed to grow, and coppice was the chosen form. The third chapter reconstructs a long-run historical parable of the Karst forests, connecting research results in historiography and archaeology. The barren landscape famous in the 19th c. was indeed the result of a process going on through the early modern period, but it had antecedents in earlier historical and prehistorical periods. Attention is drawn to the fact that the early-modern Karst landscape closely resembles the form of a man-made (cultural) savannah, as the expression of an agro-silvo-pastoral system. In the end, a so-far unknown statute of the village community of Rihemberk (mid-16th c.) certifies and dates intentional sustainable forestry practices by the rural population. At the end of the 19th c. the Karst ecosystem was still vital, demonstrating that local people knew how to exploit this vitality and preserve it over time, albeit in a modified environment. The traditional Karst landscape was the result of a rational use of its natural assets, based on the environmental potentials and deeply rooted local ecological knowledge, put into service of the local population's economic and social system, values and goals.

Keywords: Woodland management, sustainable use, peasant rationality, pre-industrial period

Ključne riječi: Upravljanje šumama, održiva uporaba, seljačka racionalnost, predindustrijsko razdoblje

INTRODUCTION

The very concept of »karst« which refers to all the world's karstic phenomena, environments and landscapes, is named after the Classical Karst. It represents an extraordinary example of relationship between man and the environment and of the anthropic adaptation of a particular natural environment.

In order to understand the cultural landscape of the Karst and the history of its environment, it is necessary to know how and why it has been transformed by man over the centuries, what are the material traces of this tenacious work, what was the function of its individual elements and what the meaning given them by its inhabitants. The cultural landscape of the Classical Karst can at first sight appear elementary and primordial, whereas in reality, as a result of the difficult conditions that the environment poses to man, it is rich in different elements, representing the result of a stratification of interventions, of centuries of a demanding and incessant work of transformation by man, who has impressed on it the signs of his work giving shape to a specific and distinctive landscape. We can say that in there is no surface palm, neither cultivated nor woody, that man has not more or less transformed and arranged at least once in the past, thus impressing a high density of cultural, material and immaterial contents. I will not be able to present all these aspects in this article and will therefore concentrate on the history of the woods, its interpretation and understanding.

The Classical Karst (from now on I will refer to it simply as »Karst«) is a limestone plateau stretching for some dozens of kilometres in length and width (amounting to around 650km²) along the northern shores of the Adriatic Sea, mainly reaching from 200 to 500 metres above its level. The conditions here are quite unfriendly for agriculture. The Karst suffers from lack of surface waters and an abundance of fiery winds, affording little cultivable land along with plenty of rocks and stones scattered all over the grasslands and woodlands and even in the cultivable earth. At the beginning of the 19th c. the Karst peasants agreed they had »no real woods:« in fact, the cultivated land consisted of small fields to tiny plots, meadows and wide stony pastures with scattered trees and patches of wood here and there. Around 1830, 38% of the surface consisted of bare pastures and a further 7% of treeless meadows. Pastures and meadows with trees amounted together to nearly 23%. All existing forests were cultivated in the form of coppice woods and covered a scarce 8% of the surface. This means that the woodless surface amounted to about 45%, while that with (although mostly sparse) trees to a good 30%. The remaining scarce quarter of the whole surface comprised arable land, village buildings and lanes.¹

The cultivation combined cereals (polyculture) and vines, mostly in the form of mixed-culture (vines growing on trees on the same plots as cereals): this was the way the Karst »Teran« wine was grown. Along the steep Adriatic coast and towards the Vipava valley specialized vineyards were present, where sweet sparkling white wines were produced (in this area originates the »Prosecco« wine). In particular close to the coast (but in some periods even further to the inland) olive growing and oil production was well represented. However, most of the Karst land was devoted to animal husbandry: remaining at the 1830-figures, pastures with or without trees covered nearly half of the surface (48.5%) and meadows with or without trees another scarce fifth (19.5%), amounting together to more than two thirds (68 %).

The article deals with the age-old question concerning the history of the Karst forests, which to a large extent corresponds to the question of its denudation and of its later artificial reforestation. The traditional interpretation uses a degradationist narrative rooting in 18th and 19th century policies and forestry science and keeps it alive, while my goal here is to put it into question by applying an alternative reading. Our central question is, whether the bare and stony Karst we know especially from the nineteenth century was the result of unsustainable exploitation of natural resources, for example through deforestation and overgrazing, or is it possible to see a rationality in the forms of use by the local peasant population. This is of course linked to the question of the extent to which the Karst had been covered with woods in a more distant past. These issues concerning the Karst represent a particular expression of the wider problems in current scientific research. Among them there is the discussion on the forms of collective use of natural resources (forests, pastures, waters), in particular questioning whether European rural communities that put them in place were able to do so in a sustainable way; were such uses sustainable for the natural environment or instead indiscriminate and devastating; did the rural communities and societies had knowledge of the local environment that was appropriate for the sustainable management

¹ PANJEK, A. *Kulturna krajina in okolje Krasa*, 98–9.

of its resources;² is it possible at all to consider the European and especially Mediterranean woods as natural phenomena.³ The Mediterranean area, with its long history in the relationship between man and the environment, and in its framework the Adriatic area and the Karst in particular, represents an ideal observatory to address these issues, being a particularly fragile and sensitive environment, which at the same time constitutes the archetype of all Karst areas in the world.⁴ In history, the karstic environment has placed specific problems and challenges to man and his activities, from which peculiar reciprocal relationships have taken shape.

In recent environmental history two fundamental considerations have been established which constitute the methodological reference points for the study of the relationship between man and his environment: man is a necessary and decisive factor while nature plays the role of an active subject. This leads to the identification of the problem that arises as a fundamental question, namely the environmental and social sustainability of the exploitation of natural resources over the long term. In our case, this issue emerges from the fact that the barest rocky areas in the Karst were the commons (*kraška gmajna*). The question about the possibility that the collective forms of exploitation of natural resources could be sustainable, is present in the social sciences and also in historiography at least since the publication of the article by Hardin on the »tragedy of the commons« (1968), in which he maintained the thesis that there are no effective and sustainable ways over time for the collective use of common assets as the user's desire to maximize revenues inevitably leads to their exhaustion.⁵ Numerous researches in the field of ecology, history, economics and sociology have tried to confirm or refute this assumption. Others demonstrate, vice versa, that there can be effective and sustainable methods of »common pool resources« management provided that institutional frameworks and agreements take shape among the direct users.⁶ Anthropological studies also refute the interpretation according to which in traditional societies, whether for the search for individual benefit or for lack of adequate knowledge, peasants would not manage the natural resources in order to ensure their long-term sustainability. James Scott for example emphasized the importance of the »vernacular knowledge of local ecosystems«, based on practice and experience in the exploitation of the natural resources, affirming not only their sustainability but also better environmental and social sustainability than modern forms of use.⁷ Moreover, an interpretive current affirms that the wood should not be considered exclusively as a natural phenomenon, exposed to human exploitation, but that in history it »is, above all in the Mediterranean area, an artifact and must be studied as such«.⁸ In other words, trees are not just environment, passive victims of anything that man decides to inflict on them. They are not just part of the scenario in the theater of history: they are actors in play and everyone has a different role.⁹

The anthropic changes are not necessarily intended as a consequence of destructive exploitation methods, but as customary forms of use, based on precise knowledge and responding to the needs of economic rationality of local communities, which at the same time assure the renewal of natural resources even in a changed environment. For this reason, we talk about sustainable forms of exploitation of the anthropic environment, capable of contributing also to the social sustainability of the relationship between population and natural resources. Unlike the prevailing approach so far, this is the perspective we are applying here. Between the two extremes, destructive exploitation and sustainable management of natural resources, where does the history of the Karst environment and especially of its woodlands stand?

² SCOTT, J. C. *Seeing like a State*.

³ MORENO, D. *Dal documento al terreno*.

⁴ GROVE A.T., RACKHAM O. *The Nature of Mediterranean*.

⁵ HARDIN, G. *The Tragedy of the Commons*.

⁶ OSTROM, E. *Governing the Commons*.

⁷ SCOTT, J. C. *Seeing like a State*.

⁸ MORENO, D. *Dal documento al terreno*.

⁹ RACKHAM, O. *Forest History*, 298.

After this introduction, the article is divided into four parts. In the first chapter I present and discuss interpretations on who and which would be the actors and factors of Karst deforestation, while in the second the early modern peasants' woodland and pasture land-use system is presented. The third chapter discusses the historical parable of the Karst forests, interpreting in connection with the relationship between man and the environment. An attempt is made to read the Karst forest history as the result of sustainable use by the local peasant population. The fourth chapter presents a so-far unknown document from the 16th century that certifies the forestry practices of the rural population and may confirm the proposed, renewed interpretation. Some closing remarks are made in the conclusion.

1. WHO DESTROYED THE KARST WOODS AND HOW?

The treeless and stony landscape evoked by the term »karst« is to some extent undoubtedly a historical phenomenon, the result of anthropic interventions. According to a traditional view, the great demand for timber from the neighbouring Republic of Venice, due to the Arsenale's and urban development needs, contributed substantially to such state of affairs in this area and on the eastern Adriatic coasts in general. This is in fact linked to the questioned interpretation of the forest management by the Republic of Venice, where opinions range from careful conservation to reckless cutting.¹⁰ Another well-established thesis identifies the determining factor of forest reduction in the irrational and destructive forms of wood resources use by the local peasant population, where one may recall Piussi (1976) who refers to the opinion expressed in 1928 by Grubić for Dalmatia.¹¹ Both interpretations share a clear common trait in reading the Karst woods' history as a degradation story, and such a narrative is well established in scientific as well as publications of a more divulgative nature until nowadays in Slovenia. As opposed to the negative traditional practices of woodland use, the artificial reforestation through implantation of exogenous trees in the 19th and 20th century is still understood as a positive achievement even in the most enlightened recent works in Slovenian forestry science, albeit mentioning also dissonant arguments and the local population's opposition.¹²

It's interesting to notice how the criticism towards the peasants' way of using the woods remains the same in a report on the state of forests in the Austrian Littoral by an expert commission working for the state Chamber in 1724, as well as in the forestry science from the late 19th and early 20th centuries, as nowadays. These interpretations express severe evaluations about tree-cutting practices on the karstic soil.

In 1724 it was found that in the only larger wood to be found on the Karst, by Senožeče, the Austrian Eastern Company, established some years before, had already knocked down about 20,000 trees: »It is formed of beech, oak and Turkey oak of 1 to 3.5 feet of diameter [30 – 110 cm], partly pollarded and pruned. [...] It is also grazed.¹³ Even in the Lipica state stud-farm wood, consisting of »beautiful oaks«, »in many cases the top and branches have been truncated, so the plants waste away«. In other woods on the Karst the oaks and other sorts of trees were of a »shrubby appearance«, while the »better« plants had trunks measuring from 20 to 95 cm in diameter. As concluded by Piussi, who analysed the whole report, the situation on the Karst was similar as in the other areas of the Littoral.

All or most of the forests visited are subject to grazing goats, sheep, pigs, cattle and more rarely, horses. [...] With the cutting of branches or tops or even whole trees that were left on the ground, the cattle were supplied with a large quantity of fodder. The consequences that such a practice could have on the density of the forest and on the conditions of the plants subjected to this type of pruning are evident. The bite of the cattle is then a decisive obstacle to the affirmation of the juveniles. [...] The feeding of the livestock is also ensured by the meadows obtained with reclamation or, more simply, by grazing

¹⁰ ZANNINI, A. Un ecomito? Venezia.

¹¹ PIUSSI, P. *Un inventario forestale*.

¹² PERKO, F. *Od ogolelega do gozdnatega krasa*.

¹³ PIUSSI, P. *Un inventario forestale*, 33

land obtained destroying the wood by girdling or firing. Part of the fodder consists of hay harvested in the forest: the Commissioners recall in some cases this practice because it systematically destroys the renewal. It is clear that in order to obtain a good quantity of hay from the undergrowth of an oak-wood, the density of the oak-wood must be considerably reduced.¹⁴

We must bear in mind that the aim of the commission was to find tall and large trunks. Nearly two centuries later, in a work promoting the implementation of better ways to use and cultivate the woods in Slovenia (Littoral and Carniola) for the benefit of peasants, Avgust Guzej, Austrian state commissioner for forests in Novo Mesto, in 1903 described as negative the same practices, that had been pointed out in 1724.

There, where on such [karstic] soils the forests are destroyed, the water washes away the fertile, usually very fragile layer of soil, carrying it partly along the surface and partly into rock fissures, but it is also taken by the wind bora, this is a strong eastern or north-eastern wind which, especially during the winter, shaves in Karst places. And how soon the until then fertile land is transformed into a desert! It is not much better in those forests, where the bad habit is rooted, to pluck and crush the trees for fodder, bedding, firewood or for poles in winegrowing places. [...] In such forests all the branches are cut till the top of the tree, and the new growing branches are cut every third to sixth year, or the trunks are cut off in a height of 2 to 5 meters and the new shoots growing on the top are cut at short intervals. This way you get a little more grazing, because the untreated soil grows with weeds and grass. [...] The earth dries up and becomes ever more barren due to the lack of fertilization, the natural tree growth is impossible because the trees do not bear seed, the old trees begin to dry slowly and have to be cut off, and the forest is becoming less dense year after year. From trees cut in such a way only firewood may be obtained.¹⁵

But reducing the subjects responsible for the destruction of forests to Venice and the local peasants is simplistic, since the factors that in a pre-industrial economy determined the consumption of forest resources were fairly numerous. The woods were exploited both as space available for agriculture and breeding, as well as for timber, that is as a source of energy, construction material and goods.

In the agricultural sector the main factor of exploitation was undoubtedly constituted by reclamations in order to obtain new fields and meadows, to which various other minor uses can be added. The most important factor in breeding was the pasture system adopted, with the use of wooded areas. Among the factors that determined the consumption of forest resources as raw materials, there were first of all the rural and urban domestic needs: wood for cooking and heating, furnishings and tools. Then there was the demand for timber generated by the building, which was also urban and rural. Although a growing part of the buildings was built of stone, stone constructions also required the use of wooden structural elements. The growth of cities in the eighteenth century, and in particular Trieste, was an important factor in the increase in consumption of timber for construction and domestic use. The use of wood in the various forms of rural industry was widespread, too, from the production of coal to that of barrels, but also in the craftsmanship in urban areas. A significant factor in wood consumption within the secondary sector was the centralized plants, whether they were mines, ironworks or factories, although these were not much present in the Karst area. Also in this case the eighteenth century led to an increase in consumption, due to the installation of new »factories« sustained by the mercantilist subsidies of the Austrian state, in particular in Trieste but also in Gorizia and, in some cases, in the countryside. In the commercial field an important factor, which acted for the whole modern times, was represented by foreign demand, coming essentially from the Venetian Republic. But it was not the only one. The sale of wood presupposes the existence of the will to sell by the owner of the woods, or at least those who managed them. An important factor in the exploitation of forest resources must therefore be identified in the interest of the Austrian sovereign to increase the profitability of his forest assets through the marketing of timber, in order to increase revenue, but also to support its mercantilist policy and the

¹⁴ PIUSSI, P. *Un inventario forestale*, 46-47.

¹⁵ GUZELJ, A. *Navod za oskrbovanje*, 4, 7-8.

need for timber (buildings, ships) that it created. The same choice, determined by the desire to increase income, was sometimes also made by subjects who would not have had full rights to do so, like some feudal lord or rural community. On these bases it is possible to identify, in more general terms, two other factors that contributed to determining the intensity with which the other factors of consumption of the forest acted: the demographic trend, that is the population growth, and the economic conjuncture.¹⁶

Several interpretative proposals dealing with forest exploitation in western Slovenia and the Littoral have already identified a large part of the above listed factors, each time stressing more some factors than others, not least according to the addressed area. However, all agree in identifying the strongest consumption centres of timber in the large centralized industrial plants, such as mines and foundries. A second important factor is agreedly identified in agricultural reclamations.¹⁷ Here I will only make some observations that complement and clarify acquired interpretations.

First of all, it is important to underline how each of the factors of exploitation of the forest resources was able, even acting alone, to lead to the depletion of a relatively large wooded area. However, each of them acted differently. Reclamations for agricultural purposes (fields, hay meadows) created a leopard-stained pattern on the wooded mantle. The exploitation for grazing instead had a more widespread character, which affected above all the renewal of the forest and could slow it down to blocking it. Exploitation was also widespread for domestic and rural industry (firewood, firewood, tools), which became particularly intense in the vicinity of rural and urban population centres. Industrial uses, from the production of coal to the supply of the major centralized plants, passing through the building uses in the city and in the countryside, acted with a deforestation that could spread around like wildfire according to the size of the consumption centre. Commercial exploitation, whether wood was used on the domestic market or for export, could lead to bleak cuts, especially of the most valuable plants, provided that affordable transport possibilities existed. It was in particular the interaction of the different consumption factors on the resources of the same forest area to constitute the main road of depletion, able to lead to complete deforestation in case the territory was particularly subject to erosion.¹⁸

Posing the question on the relationship between external and internal factors, it is possible to answer that the endogenous factors of exploitation of the woods were more numerous than the exogenous ones, and that the same export also responded to internal, tax or other specific interests. On this basis it is possible to agree with those who believe that the internal factors had a greater ability to affect the forest assets and the environment of the Slovenian Littoral in preindustrial times.¹⁹ However, the resources offered by spaces more or less densely covered by arboreal vegetation were used in ways and for very numerous purposes. The wooded areas were the object of the most varied uses by a variety of subjects in all sectors of the economy, in primary, secondary, and tertiary, so the sustainability of their exploitation depended, not least, on the number and intensity of the usages and users insistent on the same territory.²⁰

2. THE PEASANTS' POINT OF VIEW

But let's get to the peasants, because their use of the woodland is at the centre of attention in this article. The scarcely dense woods, mentioned above as a result of irrational exploitation by peasants, were in fact a form of use typical of the Karst, which shaped a specific form of cultural landscape, the wooded meadow. Such woods were of course of no interest for the nascent Austrian navy in 1724, nor for modern forestry in the 19th c. But it was not in the interest of the peasant that the trees grew in the

¹⁶ PANJEK, A. *Vzhodno od Benetk*, 113-114.

¹⁷ VALENCIČ, V. *Nekdanji deželnoknežji gozdovi*, 245-249; PIUSSI, P. *Un inventario forestale*; MIHELIČ, D. *Kratek prerez zgodovine gozda I*; GRANDA, S. *Kratek prerez zgodovine gozda II*; VALENTINITSCH, H. *Idria und Fragen der Umweltgestaltung*, 63-68.

¹⁸ PANJEK, A. *Vzhodno od Benetk*, 114-115.

¹⁹ VALENCIČ, V. *Nekdanji deželnoknežji gozdovi*, 245-249; PIUSSI, P. *Un inventario forestale*; GRANDA, S. *Kratek prerez zgodovine gozda II*.

²⁰ PANJEK, A. *Vzhodno od Benetk*, 116.

way and to the measure that satisfied the needs of the naval sector; in fact, he could not profit from such a forest management or at least the gain was not such as to counterbalance the lack of use of trees for a century, the time necessary for their renewal and growth. That was the reason why Avgust Guzelj found it necessary to explain the peasants why their model of wood management was bringing negative consequences to themselves (lack of construction wood, poor trees, impoverishment of the soil). So let us see the use of woods and trees on the Karst from the point of view of the peasants.

When asked about forests in their communities, the Karst population in the years 1820 – 1830 often replied that there were no tall trees, in fact there was no woods and that only in the pastures did grow shrubs from which, every twenty years, poles were made. In some places woodland was not even mentioned. Where they were mentioned, all were very similar in composition: oak, ash and hornbeam in this order; rarely any other species was reported. There were other common characters, starting from the fact that the population hardly considered these surfaces as real woods and normally did not treat them as such. As examples follow some eloquent self-descriptions relating to different areas of the Karst, the highest part of the plateau to the south-east, the north-west and the area near the sea-coast.

There are no woods, nor tall trees for cutting, and very few are the oaks growing on some meadow whose wood if cut would cover a 3.5 m² surface; then take note, that the soil under that tree produces only a small quantity, and of poor quality of grass. [...] There are no trees on land whose trunks could be used [...]. On the commons there are some spines growing here and there, and juniper bushes, which serve to half the needs to bake bread.²¹

In the community there are no so-called woods, but there are those planted with coppice wood, mostly hard, other qualities of wood are not to be found. [...] Branches and tree-tops are used partly for firewood, part for sheep's food. The poles are usually cut every twenty to twenty-five years, in the autumn season. [...] Forests of tall wood in this territory do not exist [...]; there is well hard coppice and bushes, which once they are cut, only in thirty or in twenty-five years would become of such quality of wood to be cut again. [...] Not being tall woods, scarcely dense woods of hard coppice do not give wood for construction. [...] Some woods are to be found, which, not being very thick, are also used as meadows, [...] the hay in the same is cut only once in a year.²²

In this community there are no woods, in the places where the trees grow, we mow the hay and are therefore also considered as grassland. Oaks, ash trees, beeches, etc. grow in these enclosed areas. The branches are used as firewood and to make poles, which are cut in September. [...] The forests of this type are, in fact, the woods of the community, they are like meadows of this community and they are mowed only once a year. These woods (enclosures) belong exclusively to private individuals [...] In fact, in this community there are no meadows, since everywhere where you cut the hay there are surfaces with bushes and trees and only between them and among the thick bushes the peasant can collect the hay, with effort and mostly with the sickle. In this community you can find only meadows of this type, called ograde [...]. There are only a few tall oak trees, some of which are used as firewood, others as construction wood.²³

Most of the Karst areas in which trees were present had neither the appearance nor the exclusive function of a woodland. The trees and bushes of more or less relevant size grew on surfaces with different cultural destination, always mixed and never with a prevalence of forestry. These were mainly meadows and pastures with arboreal presences, spaces with dense tree cover were rare. The promiscuous or multiple use of all types of land is clearly evident in the cited peasants' answers to the questions in the land registry, from which we are taking these information: there is invariably a common approach with overlapping forms of use of wooded areas, pastures and meadows.

Where the Karst peasants preserved and took care of the trees, the type of management was almost exclusively that of the coppice, in which the trunks of the broadleaves are cut periodically close to the

²¹ AST, CF, Štorje, S4.

²² AST, CF, Brestovica pri Komnu, S4.

²³ AST, CF, Zgonik, S4.

ground, so that new shoots develop from the stumps. After a few decades they can be cut again. The coppice wood is particularly suitable for the production of firewood, poles and other small lumber; this was precisely its use and its destination in the Karst, since when referring to the forms of use of tree-wood, peasants always talk about firewood and poles, especially for viticulture. In fact, practically all the surfaces that in the statistical part of the cadaster were included in the »forest« category, are called »coppice wood«.

In many places wood is also mentioned for the repair of agricultural implements, more rarely pieces of larger dimensions are mentioned, suitable for obtaining beams to be used in the construction of houses. The description, noted in the hamlet Voljči grad, is an eloquent example of a widespread scheme: »The woods are populated with oak, ash and hornbeam. From these and from the meadows with firewood we obtain the necessary number of poles to support the vines, and the firewood, over a few rafters and some pieces to put back the rural instruments ». Furthermore, it is quite clear that the peasants operated an active selection of tree species, limited to three ones only: the predominant oak, together with the beech and the hornbeam. These essences were maintained and cultivated for their ability to adapt to the environment and because they were suitable for their use and destination.

Timber production was far from being the only form of exploitation of trees and wooded areas. An important segment of their use, in fact, consisted of breeding, practiced in different forms. Here, of course, we must first remember the pasture. The system was complex and simple at the same time, in any case such as to help to further clarify and understand the functionality of the environment and the landscape of the Karst, as they were. The inhabitants of the Karst and the surveyors of the cadastral operations had declared and noted that the primary use of the wooded areas was in fact grazing. In their responses as a rule the terms »forest« or »pasture with trees« as well as »meadow with trees« were associated and treated together: »The woods give the necessary firewood and pasture to the animals«; »The woods are also populated [with trees] as meadows and pastures, and are grazed in the summer season«; »The woods, besides the pasture that is practiced there, are populated with wood«.²⁴

The more or less large surfaces, with a more or less accentuated tree cover, were at the same time an additional source of fodder and litter. In many places hay was insufficient for livestock and in practice nowhere could animals feed on grass and hay only. The feed was composed of a small amount of hay to which was added a lot of straw, so the latter was not sufficient for the barn-litter and was therefore integrated by the gathering of tree-leaves. After this use, the litter of leaves and straw was reused as manure. In several places it was noted: »Those few leaves that can be picked up with great effort between the stones are used for the litter, because due to the lack of hay the straw is used as an addition to the feed«.

The breeding system shows how the different types of land with grass and trees each acquire their own role in an organic context. In the spring the cattle were grazed on the commons, that could be completely rocky, bare without trees and with little grass between the stones, or covered by a more or less thick shrub and arboreal vegetation. Sometimes the wooded pasture would have a greater tree-coverage, more like a woodland, but its use was the same, serving as pasture. The grazing season of the cattle lasted from April until August to October depending on the local climate and on the quantity and quality of the pasture. Moreover, the cattle frequently could not find sufficient nourishment on the pastures and therefore needed to be fed on their return, sometimes even the morning before departure.

*Livestock throughout the summer are sent to pasture on the commons, dry and stony places usable for nothing else [...] so many times it is necessary to give them subsidy especially in the evening some foliage of the vines, trees etc. picked up in the countryside.*²⁵

In the next phase in the grazing cycle came the meadows, with or without trees or bushes, mainly owned by individuals. Unlike the pastures, the meadows were often worked, this means that in spring the newly »grown« stones were eliminated and used to raise the walls that separated the individual grassland from the surrounding common pastures. During the summer, generally between July and August,

²⁴ AST, CF, Sežana, S5; AST, CF, Naklo, S5; AST, CF, Tomaj, S5.

²⁵ AST, CF, Gorjansko, S4.

peasants would mow them for hay. This was mainly women's work: »Women with small sickles must cut and collect grass between rocks and stones.« After that, the cattle moved to there until the end of the grazing period in late October. Shortly afterwards, between August and September, on these wooded meadows, as well as on the pastures with trees and on the woodland, the wood for the poles was cut.

Like on all the areas where arboreal vegetation was present, at the end of the grazing season the firewood was collected; in fact, everywhere the meadows offered, besides the hay and the autumn pasture, also firewood (as well as material for poles, agricultural tools and in some places also for beams). »On the meadows there are some oaks that are used for domestic needs, and precisely beautiful trees for construction [...] which however become suitable for use in one hundred or two hundred years« was said in the Sežana area.

From October-November and during the winter the cattle remained in the stable. But by far the most numerous were the sheep, almost 70% of all livestock, that grazed on the common pastures and on the individual meadows, too. Although they were the most numerous, in the cadastre they are not given much attention. In winter they had to be further foraged in the stable, both in the morning and in the evening, with branches, tops of trees and shrubs. In the Gorjansko area it was precisely reported that »the leaves of the ash are dried out and used to graze the sheep in the winter.« This means that to feed the sheep the leaves were collected, the branches of the trees and the bushes were cut off, dried out and then stored for the winter.

The system of exploitation of natural wooded and grassy resources in the Karst was elaborated and perfected down to the smallest detail. It contemplated the prevalent use of common land for most of the grazing period, after which the livestock was kept for a few months mainly on individual meadows, which had previously been mowed and whose hay was the basis of winter fodder. At the same time, the trees were used to satisfy all the domestic needs of firewood and timber, but at the same time also to obtain fodder, while the acorns of the oaks were intended for pigs. The system was based on the optimal exploitation of all available natural resources so that each individual resource gave the maximum possible yield, taking into account its peculiarities and the characteristics of the Karst environment. Every natural resource had its own role, indeed usually more than one, in a perfectly coordinated whole. At the beginning of the nineteenth century this system allowed the breeding of a large number of animals on a relatively small territory: more than 37,000 sheep, over 12,000 cattle, more than 3,500 pigs and over 800 horses, donkeys and mules. The number of animals was higher than that of the human population, in most areas the density of livestock was higher than 50 heads per km² while in some it exceeded 100.²⁶ Alongside grain cultivation and viticulture, pastoralism constituted one of the fundamental pillars of the local peasant economy.

And what about the woods? The scarce presence of trees was attributed by peasants to the stony slopes.

The stony slope of the territory does not leave that depth, which would generally require any plant to take root, and become tall trees, so that known the little or no use of such sort of woods, it can be said that their cultivation in this community is totally missing. Natural woods do not exist in this community, but there are some plots scattered here and there with strong coppices, but these traits in complex do not have the true meaning of the word forest. Therefore, the situation in the Karst is not such as to be fruitful in this kind of cultivation; too stony is the slope of these mountains, so plants cannot take root and grow.²⁷

It clearly emerges that in the Karst the forest had no meaning for the peasant, if only for the simple fact that in their opinion woods could not prosper. A further step and even clearer comprehension is offered from the people of Devin/Duino and Jamlje/Jamiano, where was written that the »meadows, and woods, being ancient and of method, cannot by any means be indicated as distinct«. This statement is of particular relevance, not only because it represents a fine example of resistance to an attempt at admi-

²⁶ KOLEGA, N. Prostorska analiza prebivalstva in živinoreje, 332.

²⁷ AST, CF, Jamiano, S4; ASG, C, Opatje selo, S4.

nistrative classification or the inadequacy of official definitions.²⁸ For our purposes it is even more important that this way the peasants expressed the awareness and conviction that the form of environment, in which there wasn't a real woodland but grassy surfaces scattered with sparse trees, reflected their ancient method of use, in favour of which the natural environment had been systematically modified, adapted and systematically preserved in its new shape for a long time. They also emphasized that their answers based on »what continuous experience teaches, and what the fact confirms«.²⁹

This means they pointed out how their practices of cultivation and use of the karstic environment rested on local knowledge, formed through the generations, about what was possible and sensible and what was not. Remember that in the area of Sežana they had noted that oak trees reached a useful measure (to obtain construction timber) only after one or two hundred years. At Zgonik/Sgonico they stated that »on the best land the oak reaches again after 50 years such a state as to be profitable«, but also that »if you cut a very old oak, you will also dry out the roots«. In this case the tree is lost forever, the regrowth is very slow and long. No sooner than the grand-nephews could have hoped to get the timber for the beams of a house from a new tree. And in the meantime? From the point of view of the Karst peasant, the system of cultivation and use of the trees which provided for the pruning of the branches and the coppice management was certainly more reasonable. Such a regime of exploitation of the »wood« and also the time of pruning were established according to local experience and knowledge: »The ash poles must be cut at the end of August, and in September, otherwise they are subjected to the devouring by the worms [...]. The piles of oak are cut in wintertime«.³⁰ The trees were not cut indiscriminately but were exploited according to a tested pruning cycle, established taking into account their ecological knowledge, the quality of the soil and conformed to the re-growth, which provided the farmer with the necessary firewood and work-wood.

The inhabitants of the Karst did not destroy the woods and the trees, they used them. Every single tree was there with a specific purpose. In determining the use of the environment and the single plants, they based on the verified characteristics of the karstic terrain, the climatic conditions and the experimented vegetative capacity of the different species. It may be concluded that, according to their experiences and knowledge deriving from the practice, peasants considered that in the Karst the »real forest« was not economically justified. The trees, in fact, grew rather badly and slowly, so that the potential yield and income obtainable from construction-timber would have been lower than that obtainable from the same area if used also for grazing, in particular if the woodland had been thinned out to produce more grass, while using the remaining trees to meet all daily and seasonal needs. It must also be considered that the cultivation of tall trees of regular shape required the farmer to renounce their exploitation, resulting in a loss of (potential) income or a source of necessary wood and grazing land, extended for several decades or even a couple centuries. For this reason, only the trees necessary to cover domestic needs, consumption in the vineyards and to supplement fodder were allowed to grow on purpose. It was for this reason that they had chosen the coppice as their form of tree cultivation.

3. WHAT FORESTS SHOULD HAVE THE KARST PEASANTS DESTROYED? TOWARDS THE SAVANNAH

Environmental history addresses the relationship between man and the environment. We may identify two predominant currents of thought regarding the past events of the environment in the Mediterranean area. The most conventional historiography supports the so-called »degradationist theory« whereby, through excessive exploitation man has depleted an environment once covered by rich woods, irreparably transforming it into a stony land that cannot offer sustenance to its inhabitants, thus

²⁸ SCOTT, J. C. *Seeing like a State*.

²⁹ AST, CF, Duino, S4, Jamiano, S4.

³⁰ AST, CF, Gorjansko, S4.

obliging them to emigrate.³¹ The Mediterranean environment would represent an example of the massive ecological degradation for which the bushes and the scattered trees are interpreted in Braudel as degraded forms of forest.³² This judgment is deeply rooted in various scientific disciplines and in public opinion. The deleterious effect of anthropogenic activities on the natural environment throughout history is also supported by most recent global works.³³ It is possible to notice that a degradationist reading of the history of forests, the environment and landscape of the Karst has been and still is prevalent. But Grove and Rackham pose a question: »Was there ever an idealized aboriginal vegetation from which degradationist theory begins?« In their work on the Mediterranean environmental history they analysed also the karstic landscapes, whose vegetation can range, in their interpretation, from desert to savannah and forest, and among them also specifically the Classical Karst in Slovenia that is our topic here. As for the latter, they argue that in more recent times it had a semi-desert appearance, but that there is no evidence of the existence of a prehistoric forest, nor of the modalities of its disappearance, advancing the hypothesis that it could have been a savannah.³⁴

According to what has been illustrated, we could say that part of the Karst, and in particular the Karst commons (*kraška gmajna*, *landa carsica*), could perhaps actually look like a desert, but if we include the wooded pastures and meadows as well as the sparse coppice woods and consider the natural resources management system we just described, the Karst may be seen as more conformable to a savannah than to a desert. Many Mediterranean savannahs (and other areas) are the result of human activities and can therefore be defined as »cultural savannah«.³⁵ Because of the crucial role played by man, also the Karst environment and landscape, as we know them in modern times, are in my opinion consistent with the concept of »cultural savannah«.

For these two reasons, that is discussing the degradationist theory applied to the Karst and the alternative possible identification of its landscape as a cultural savannah, we will now briefly outline a long-term history of the Karst environment and its woods. The question of the possible existence of Karst forests in a distant past, up to the Stone Age, is in fact directly linked to that of the culturality of the Karst savannah and in particular to the sustainability of the natural resources management of in the modern age, at the end of which the Karst appeared as we have seen it so far.

To this end, we will lean on written sources but especially on investigations on the past Karst forestation, resulting from both archaeological excavations and pollen sediment analysis. Of the latter we have data coming from near Koper, dating up to 7,000 years ago³⁶ and covering the different areas of Istria, Brkini and the Karst. To avoid misinterpretations, only evidence on the oak pollen will be taken into account, being a typical tree on the Karst.

As first, the Paleolithic ended with the oak pollen in a remarkable increase, which means that before that oaks were less present. From that time onwards and until the beginning of the modern times (16th century), the presence of the oak shows strong oscillations, with alternating phases and at least three times, precisely in the Copper and Bronze age, reaching a level as low as that in the 16th c. This means that it was not the first time that in the Karst oaks were as scarce as in modern times, that are the ones we are mainly addressing in this article.

The relatively modest extension of the oaks towards the end of the Stone Age and in the Bronze Age is in line with some interpretations that complement each other in demonstrating that the Karst in prehistoric times was not covered by large woods and that they had already been plowed. For the period of late prehistory, a scenario has been proposed that »indicates an agricultural and pastoral use with intense internal colonization [...] and probably causes a significant deforestation of the Karst«.³⁷ Precisely

³¹ MCNEILL, J. R. *The Mountains of the Mediterranean*.

³² But without evidence, as stated in GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 10

³³ MARTINI, P., CHESWORTH W. *Landscapes and Societies*.

³⁴ GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 323-325.

³⁵ GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 193.

³⁶ CULIBERG, M. *Paleovegetacijske razmere*, 137; CULIBERG, M. *Vegetacija Krasa v preteklosti*, 100.

³⁷ SLAPŠAK, B. *Slovenski Kras v poznejši prazgodovini*, 162

during the period of the numerous hillforts (*gradišča, castelleri*) in the Karst, it is possible to identify practices of burning the woods to increase and improve grazing surfaces.³⁸

The sediments of some sites dating from the Neolithic to classical antiquity show »strong erosive processes« that signal »anthropic factors« (cultivation), since the bare soil is more subjected to the bora-wind erosion than grasslands or woodlands, and abundant remains of domestic animals (sheep, cattle and pig).

*Charcoal in particular [...] demonstrates that during the whole period of the settlement there flourished a clear oak forest (oak, ash, maple, black hornbeam and even some beech trees) as well as the typical vegetation of the pasture land (rowan, dogwood, cherry canine and blackthorn). A similar forest does not look anything like primary and inviolate. [...] It turns out, therefore, that by tree composition the wood at that time was more or less similar to today's, which is also typically grazing, anthropic and zoogenic».*³⁹

Another site »allows concluding that there was a mixed wood of oaks which, after the Mesolithic period, turned into a remarkably thinned and degraded thicket of pastures in the process of reforestation«.⁴⁰

The oaks grew considerably during the Roman period. Writing about the *castellum Pucinum* located on the Karst, in the first century of our era Pliny used the phrase *saxoso colle*, and added that the famous *Pucina vina in saxo conquantur*, meaning that here the grapes ripened among the stones.⁴¹ Therefore, even in Roman times, when the quantity of oaks was at its peak in historical times, the surface of the Karst also appeared, at least in some areas, markedly rocky.

In late antiquity and in the early Middle Ages the presence of the oak was constantly decreasing. The famous *Risano Placitus* (804) dates back to this period. Among other matters it regulated the access to natural resources between the Istrian towns of the coast, including Trieste, and the Slavic population of the hinterland. The *Placitus* concerned an area that, in addition to the Istrian peninsula, certainly included at least part of the Karst and the Brkini, to the extent that they belonged to the Trieste *numerus*.⁴²

*He took our woods, from which our ancestors drew the herb and the gland. [...] He also installed the Slavs on our lands. They plough our lands and our tilled plots, they cut our meadows, they graze our pastures [...]. These woods and pastures, of which you say, I thought that from sir the emperor they had to be public.*⁴³

Even in the middle of the Middle Ages, in addition to the cultivated fields, we can see woods in which cattle, sheep and pigs graze, and then fields, pastures and meadows. To our purpose, the information that these types of use of the environment were practiced by the newcomer Slavs is equally relevant as the fact that the same was done previously.

Between the late Middle Ages and the early modern times, the oak (always basing on the pollen sediments) had a wide and very rapid diffusion, only to gradually decrease again to the rather limited pre-existing extension. In this period, simultaneously with the expansion of the oak there was a contraction of the grain and therefore of agriculture.⁴⁴ Advancing a conjecture, we could identify the cause of both phenomena in the black plague (around 1350), the epidemic that disrupted the European population.

The placing of the rapid diffusion of the oak pollen in the 14th c. may be confirmed by the Trieste statutes of the 14th c. that mention, among others, the forests of the Vena/Vejna, located on the Karst

³⁸ FABEC, T. Geoarheološke lastnosti zapolnitev vrtač, 52-53.

³⁹ TURK, I. et. al. Podmol pri Kastelcu, 55-56, 70.

⁴⁰ TURK, I. Sklep, 209.

⁴¹ VEDALDI IASBEZ, V. *La Venetia orientale e l'Histria*, 390

⁴² On the concept of »Istria«, comprising also the Karst, Brkini and Inner Carniola in the antiquity and Middle Ages, see KOS, M. *Srednjeveška kulturna*, 164. On the area addressed by the *Placitus* see PLETESKI, A. De Sclavis, and ŽITKO, S. Objave in interpretacije; on the economic activities in it, see sulle attività economiche in esso rappresentate invece MIHELIC, D. Istrsko gospodarstvo.

⁴³ My translation from Latin as in KRAHWINKLER, H. ...in loco qui dicitur Riziano, 74, 79. On the emperor's land as public land see Riguardo all'interpretazione delle terre dell'imperatore come spazi a uso pubblico si vedano KOS, M. *Srednjeveška kulturna*, 324, and ŽITKO, S. Objave in interpretacije, 157-158.

⁴⁴ CULIBERG, M. Vegetacija Krasa v preteklosti, 100.

above the town, protected by statutory provisions and subject to control of guardians. In the communal woods, and in the neighbouring private ones, cutting and grazing were forbidden, in particular that of goats. The same can be said about the fact that since however since the 14th c. the protection of the municipal forest assets was progressively loosened in the surroundings of the town and in the Karst area that was part of its territory. Towards the middle of the century, for example, it was decided to grant large portions of communal woods of the Vena for tilling and grazing. A century and a half later the woods of the municipal territory must have had already undergone an impoverishment, if the emperor Maximilian I in 1507 granted to the inhabitants of Trieste the right to cut oaks in the Karst woods within the manors of Devin/Duino, Rihemberk/Reifenberg, Schwarzenegg and Postojna. The town statutes of 1550 confirmed that the protective measures were relaxed, establishing that »every citizen or inhabitant of Trieste, all the muleteers and all butchers can cut grass and wood, and graze in all the woods of the municipality, and do anything else it can be done in a public place«. ⁴⁵ The fact that in 1507 the inhabitants of Trieste were allowed to exploit the forest resources within the Karst manors most probably means that on the Karst plateau there were still sufficiently large woods and in particular oaks at that time.

Just like in other border areas of the Slovenian regions and the nearby ones, the Karst entered the 16th c. in a state of demographic and economic distress, a consequence of the succession of plague epidemics and decades of repeated Turkish incursions (the last occurred in 1499). Agriculture was in »decline« because of the lack of arms to work the plundered and desolate countryside: in some areas of the Karst, around 30% of the farms were empty. On the abandoned fields (*pustote*) of the Karst grass grew and livestock belonging to the remaining peasants grazed. ⁴⁶ A decisive economic and demographic recovery began in the fourth decade of the 16th c. ⁴⁷ It is therefore reasonable to imagine a decrease in the use of woodland resources by the rural population in the decades between the end of the Middle Ages and the mid-16th c.

The economic and demographic recovery in the second half of the 16th c. was based, inter alia, on the tilling of new land and on the expansion of viticulture, favoured by the increase in wine trade. In the same period, within one of the Karst manors (Reifenberg, 1572) five woods were reported, among them an oak wood being »almost destroyed«. By then the once empty peasant farms have been occupied and were already dividing into several units, while new ones with little land (*kajže, podruštva*) were being founded on the commons. This process of setting up new fields and meadows to the detriment of the Karst *gmajna* continued also in the 17th century, involving new farms as well as existing ones, which in the meantime had been fragmented into several households. Over time the common lands were increasingly densely strewn with a sort of cultivated oases of a circular shape and surrounded by stone walls (*dolinas*). More or less parallel to the extension of the cultivation on the (better) plots of the commons, that determined a contraction of the space destined to pasture, the trees were probably thinned out to compensate, increase and even improve the grazing surface. ⁴⁸

The valuation-operations of the Karst manors in this period show that in the first half of the 17th century the most substantial woods were found in the south-eastern part of the Karst plateau (near the Brkini), while in the north western (manors of Devin and Rihemberk) they were smaller. It is however difficult to deduce the quality and the landscape character of these woods from their laconic mentions in these documents. The already mentioned forestry commission in 1724 reported the scarcity of oak trees of a certain consistency and pointed out some practices that hindered their renewal. The woods were used for the production of lime and charcoal, too. Also at this time the forest resources were more substantial in the Eastern and South-Eastern Karst. Only a few hundred trees of suitable size could be obtained from the few wooded areas. ⁴⁹ But on the other hand, we may remember that the larger woods

⁴⁵ PANJEK, G. Azioni e innovazioni istituzionali, 274-275; LAGO, L. Alcune note, 508

⁴⁶ KOS, M. Kmet na Krasu, 236; Della Bona, G. D. Osservazioni ed aggiunte, 70-72; Štih, P., Simoniti V. Na stičišču svetov, 207-208.

⁴⁷ PANJEK, A. Vzhodno od Benetk.

⁴⁸ PANJEK, A. Kulturna krajina in okolje Krasa.

⁴⁹ PIUSSI, P. Un inventario forestale, 33; PANJEK, G. Azioni e innovazioni istituzionali, 275-277.

mentioned in the first half of the 17th c. in the Senožeče manor were still there at the beginning of the 18th, since the Austrian Eastern Company cut about 20,000 trees there.

The reclamation process by peasants accelerated in the second half of the 18th c., when the rural population grew as well,⁵⁰ under the influence of the increasing demand from the growing free-port of Trieste, and led to the landscape that the Karst showed in the 19th c. Maps from the first half and the mid-19th c. show how wooded areas looked like islands on the Karst soil.⁵¹ The mid-19th c. is probably the lowest point of the of the extension of the Karst woods in the modern age. Then, artificial reforestation begun.

It is possible to conclude that from the mid-16th to the mid-19th c. the wooded coverage of the Karst underwent a diminishing phase.

Evidence is therefore sufficient to advance the well-founded hypothesis that in the past the Karst was indeed wooded, but this does not mean an uninterrupted period in which the woods remained intact in a long state of vegetative »climax«, nor that it witnessed an incessant deforestation process caused by men since their appearance in greater numbers. Furthermore, that »past« happened several times between prehistory and antiquity, and in the meantime the Karst has been several times sparsely covered with vegetation, more or less like in the early modern times. Even when the oaks were more present, stones and rocks showed on the surface, like in Roman times. This means that an at least partly bare and rocky landscape represents a normal environmental condition of the Karst in the last thousands years, that anthropic interventions may of course accentuate. The barren Karst landscape that became famous in the 19th c. is indeed the historical result of a process going on through the early modern period, but it has antecedents in earlier historical and prehistorical periods.

This reading is consistent with the interpretation supported by Moreno and by Grove and Rackham for the history of the Mediterranean environment.⁵² Basing on the mentioned archaeological investigations,⁵³ we can also deduce that when we see the Karst prevalently covered with clear woods of oaks (meaning thinly disseminated with trees), we face a landscape or an environmental form corresponding to the concept of wooded meadow or Mediterranean savannah already in prehistoric times, which was at least partly »cultural«. In support of this hypothesis we may quote Slapšak, who defined those times as the »period of domestication of the Karst«.⁵⁴ It is moreover interesting to note that in 1819 Doberdob/Doberdò the Karst people themselves used the same expression when they proposed the introduction of the category »clear coppices« to define their woods in the land registry.⁵⁵

The term »savannah«, which derives from an Amerindian term, was only later adopted for other parts of the world, particularly for Africa. The savannah is composed of a few isolated trees, scattered on grasslands or on stony soils, it can also include cultivated surfaces and even some forms of gardens can be interpreted as examples of artificial savannah. According to Rackham, in the past in Europe and especially in the Mediterranean area, there were many areas with a low density of trees, which allowed a better growth of grazing grass; it is wrong to understand the savannah as a degraded forest.⁵⁶ In the Mediterranean a type of savannah took shape, in which through pruning, burning and felling, the trees were reduced to a bushy *macchia*; the oaks were among the most widespread species in such Mediterranean savannah. As a rule, the savannah trees are too small and deformed to be used as a building material, on the other hand the tops can be pollarded for repeated revenues of wood or the branches pruned for the leaves to feed the cattle. In addition, the savannah would have been a better pasture than the forest also for pigs, which also feed on grass, and the few oaks could produce a greater quantity of

⁵⁰ KALC, A. Peasant Population.

⁵¹ MORITSCH, A. *Das nahe Triester Hinterland*, 130.

⁵² MORENO, D. *Dal documento al terreno*, 17-19; GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 188.

⁵³ TURK, I. et. al. *Podmol pri Kastelcu*, 70.

⁵⁴ SLAPŠAK, B. *Slovenski Kras v poznejši prazgodovini*, 163.

⁵⁵ ASG, C, Doberdò, S4.

⁵⁶ RACKHAM, O. *Forest History*, 299-305.

acorns. After all the savannah is also an agro-silvo-pastoral system.⁵⁷ All of this very closely resembles what we have exposed and ascertained for the Karst.

The coppice we met in the Karst, was a type of wood-form widespread in the Mediterranean area, where even the dried leaves were often used as fodder. The pruning operations of the tops and side branches are conservative practices: they allow the production and harvesting of timber and leaves without destroying the tree whose life, in fact, extends significantly compared to a plant left to grow autonomously. These are practices more typical of the savannah than of the forest. The combination of different grazing surfaces and different foraging systems significantly increases the number of cattle that the environment can withstand. It is rational to have fewer trees and consequently more grazing, moreover, in dry areas, sparse trees can better expand their roots and grow more vigorously.⁵⁸

Trees and their wood in the past were used in different ways and purposes. It is known that in the Republic of Venice, as well as in Liguria and in France, the oak branches were even intentionally and progressively pruned and forced to assume the curvature necessary for the shipbuilding activity (*stortami*). A similar example can be documented for the nearby Venetian Istria in the second half of the eighteenth century when G. C. Vittori, represented in detail the process of »cultivation« of the oak woods for navy purposes, through their clearing (*schiaritione*) and cutting of branches »so that all the oaks can get [...] the necessary curves«.⁵⁹ As for Liguria, it has even been written that oaks were cultivated as olive trees.⁶⁰ Regardless of these forestry techniques, developed for industrial purposes, both tree species and tree-covered surfaces were used in many different ways, even simultaneously, so that the ones we have met in the Karst fully correspond to the Mediterranean and also to the wider European ones. The leaves were an ancient form of fodder, in Europe the exploitation of trees for grazing was a widespread and long-standing practice.⁶¹ The same tree-covered area was a place for multi-purpose and combined use: at the same time field, pasture and forest, without this determining the total destruction of the wooded cover. These methods of use have been defined as »techniques of multiple use of forest resources«.⁶²

4. AN EARLY EVIDENCE OF SUSTAINABLE MANAGEMENT (1556)

I recently found a confirmation of all the interpretations presented to this point. The document meaningfully originated at the time when economic development and demographic growth started in the mid-16th c., bringing an increased use of wood. In the Rihemberk community statute, shaped between 1556 and 1560, the use of wood for vineyard purposes is a matter of highest concern. Let's have a look at the most relevant articles to our purpose and then briefly comment on them (*rakle* and *paladiči* are types of poles used in vineyards).

Before the All Souls Day [November 2], the cutting for rake-making is forbidden to neighbours, and that is so on the commons, in the individual holdings and in Brda [manorial demesne forest]. In addition, no neighbour may send more than three workers for three days in the felling sector, and the sale of rake is also prohibited.

The logging of oak, chestnut and beech wood for the production of paladiči is completely prohibited. The use of other types of wood for this purpose is tolerated, but the felling of paladiči must begin after 2 November.

From oak trees no one should cut off the entire trunk, but only the top should be cut off from this wood in order to preserve the oak. The cutting of oak and chestnut wood is also prohibited for the production of fences, while logging of other types of timber is permissible for this purpose, but only in the month of Saint Martin [November].

⁵⁷ GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 194-195.

⁵⁸ GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 55, 71, 192.

⁵⁹ PANJEK, A. *Kulturna krajina in okolje Krasa*.

⁶⁰ MORENO, D. *Querce come olivi*.

⁶¹ SIGAUT, F. *Gli alberi da foraggio*.

⁶² MORENO, D. *Dal documento al terreno*, 34.

The articles of the statute primarily regulate the cutting of the wood, the time when it's allowed begins in November. The most emphasized is the use of timber for viticulture but also plots, in any case primarily for agricultural purposes. A special concern is dedicated to certain species of trees, especially oaks, but also for chestnuts and beech, for which we can therefore determine that they coincided with the most precious species in the area. The use of their timber for agricultural purposes was banned or severely restricted, which of course indicates that it was previously implemented.

The special care for oak trees is not only reflected in the mentioned prohibitions related to the purpose of felling, but also in the commanded way of cutting them, which in no case should have covered the entire trunk, but only the cutting of the top part of the tree was permitted. The document expresses the belief that in this way the plant is preserved and will restart branches, while cutting it along the ground would mean the death of the tree. This technique can be understood as a description of the traditional form of tree cultivation, most probably as pollarding. Such recommendation points to the knowledge of the precarious growth and, of course, the slow growth of new, young oak trees in the Karst. For this reason, it is preferable to maintain the existing plants in life than their complete removal. Thus, the source tells us that in the middle of the 16th century measures were already taken to regulate the use of the forest, that the Karst farmers had already started with these techniques, based on ecological knowledge, and that it in this period, that we may seek the origins of the creation of the landscape in the form of a cultural savannah.⁶³

5. CONCLUSION

If we now turn to the question of the sustainability of the system of natural resources exploitation in the Karst from the 16th to the 19th c., we may observe that the ways peasants used the trees and wooded areas that were reported in the critical description by the forestry officials in 1724 (as well as in later forestry literature sustaining afforestation), were essentially the same we met more than 150 years earlier as preservative measures in the Rihemberk statute (1556) and a good century later in the cadastre (1830). Both the statute and the registry allow the understanding of the peasants' logic. We are dealing with two different points of view on the same practices, which appear to have certainly not been senseless and recklessly destructive, but rather systematic and rational practices for the local people. They confirm the methodological assumption that we must »let the historical cultivation systems of the forest, often described as irrational or prescientific by forest history and agronomic sciences, emerge from the sources«. ⁶⁴ The inhabitants of the Karst did not need tall woods, but trees to be used and large pastures, that is the savannah they shaped. Nevertheless, the pressure on the Karst's natural resources towards the end of the modern age was undoubtedly very strong, but thanks to a careful organization, the local environment could manage the presence of a large number of livestock. And so: did the inhabitants of the Karst destroy the Karst and turn it into a desert? My answer is negative.

Firstly, we have seen that throughout the Middle Ages and modern times the subjects using and exploiting the woodland resources were numerous and cannot be reduced to the local rural population. Secondly we have seen that the Karst peasants indeed contributed to the transformation of the environment, but they did so basing on their knowledge of the local ecosystem in a way that suited their economic system and social values. They did care for the sustainability of their forms of use and were able to manage the environment in a way that preserved its vitality.

The latter is confirmed by the fact that in the 1830's cadastre the tireless care dedicated to the preservation of soil fertility and the possibility of using land and meadows is stressed. Thus, for example, in Lokev it was noted that on the part of the peasants the lands »are preserved with diligence, zeal and love«. ⁶⁵ Despite the manifest and generalized lack of hay and the scarce covering of woods and meadows

⁶³ PANJEK, A. Statut in privilegiji komuna.

⁶⁴ MORENO, D. *Dal documento al terreno*, 27.

⁶⁵ AST, CF, Lokev, S5.

with trees, in numerous communities the cadastre registers an »abundance« of hay, that was consequently sold in Trieste, which is a sign of the sustainability of the natural resources use, or at least that they were not exhausted. This situation was still present almost half a century later, as is clear from the words of the imperial forest inspector and afforestation supporter Simon Scharnaggl (1873).

A real forest structure of the Karst [...] has long since disappeared and the Karst woods are represented by extensive and desolate stony fields with sporadic thickets of deciduous or patches of juniper. [...] The little land mixed with many stones of the Karst has its own incredible strength. When, during the drought, which often leaves it without rain or dew for many months, all the herbs seem to have dried up, [...] the foliage on the yellow and wilted trees begins to fall, in short the whole vegetation appears dead, amazes the rapid transformation that takes place after a nice abundant rain. As if by magic herbs and vegetables begin to sprout from the earth, the wilted foliage of the trees turns into lush green and some trees even throw new leaves.⁶⁶

Moreover, at that time in the Karst 720 cubic meters of timber were sold each year. Despite the intense use of natural resources, the Karst was still vital, but this was not only due to the hidden natural energies of the Karst and the tenacity of its vegetation. The »magic« should not be attributed solely to nature, but also to the people of the Karst who evidently knew not only how to exploit this vitality to their own advantage, but also to preserve it over time, albeit in a modified and adapted environment. Such a situation in the period in which afforestation had already started, is clearly contrary to the interpretation according to which, with excessive grazing and the killing of trees, the Karst peasants would have degraded and devastated the Karst, causing its desertification. Since according to the »ruined landscape theory« degradation is a one-way process,⁶⁷ it cannot be applied to the Karst.

The local population had the Karst it had forged, using it and keeping it alive. This can be seen in the peasants' opinion about reforestation. Such a radical change of use meant the collapse of the existing economic system. The inhabitants of the Karst were (understandably) against it. According to Grove and Rackham and Slovenian literature the reforestation of the Slovenian Karst was the first such case in the Mediterranean, elsewhere similar initiatives were carried out later. In the 18th and even more in the 19th c. throughout Europe a »conflict between foresters and shepherds for the use of the forest« developed. In the end » the forestry will win [...] supported as they were by the whole administrative apparatus of the States and from the ideology of the proprietary classes«. ⁶⁸ The strings of modern forest technicians were directed against the traditional forms of forest resource management, for the definition of which the concept of »multiple use of resources« and »integral forest economy« have been proposed.⁶⁹ The case of the Karst expresses all this. The local population wanted to have the Karst as it had forged it, because it corresponded to its economic system. And a »war« between peasants and forestry broke out on the Karst, too. The Karst was planted with in infinite straight rows that reached the horizon. Like some kind of green army. But the reforestation of the Karst is another story and it could as well turn out to be very different from the one told so far.

It may be well understandable that the Karst landscape looked as a ruined stony desert to 19th c. observers, who were indeed not all interested in aesthetics only. But it was far from being the result of indiscriminate and irrational deforestation caused by the peasant ignorance in forestry matters. On the contrary, the traditional Karst landscape was the result of a rational use of its natural assets, based on the environmental potentials and deeply rooted local ecological knowledge put into service of the local population's economic and social system, values and goals.

⁶⁶ SCHARNAGGL, S. L'economia forestale, 95–96.

⁶⁷ GROVE A.T., RACKHAM, O. *The Nature of Mediterranean*, 60.

⁶⁸ SIGAUT, F. Gli alberi da foraggio.

⁶⁹ SANSA, R. Usi del bosco, 205, 211; SANSA, R. Una risorsa molti significati, 262-263.

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SAŽETAK

U propitivanju tradicionalne degradacijske priče o povijesti klasične krške šume, članak pokazuje racionalnost oblika korištenja seljačke populacije. U prvom se poglavlju prezentiraju i raspravljaju tumačenja o uzročnicima i razlozima »deforestacije« krša. Svođenje glavnih krivaca za »uništavanje šuma« na Veneciju i lokalne seljake čini se pojednostavljenjem, jer su uzroci iskorištavanja šumskih resursa bili brojni u predindustrijskom gospodarstvu. U drugom poglavlju predstavljen je sustav ranog modernog seljaštva za šumsko i pašnjačko korištenje zemljišta, pokazujući kako krški stanovnici nisu uništavali šumu i drveće, već su ih iskorištavali. Svako stablo bilo je tu s određenom svrhom. Prije odluke o iskorištavanju, seljaci su koristili saznanja o karakteristikama krškog terena, klimatskim uvjetima i provjerenim vegetativnim svojstvima pojedinih vrsta drveća. Prema njihovim praktičnim saznanjima, smatrali su da za »pravu šumu« nema gospodarskog smisla i razloga u kršu. Samo je stablima, potrebnima za pokrivanje domaćih i poljoprivrednih potreba dopušteno rasti, a cuspis ili šikara, bio je odabrani oblik. Treće poglavlje rekonstruira dugoročnu povijesnu usporedbu krških šumâ, povezujući rezultate istraživanja u historiografiji i arheologiji. Neplodni krajolik poznat u 19. stoljeću je doista bio rezultat procesa koji se odvijao u ranom modernom razdoblju, ali je nastao slijedom prethodnih događanja u ranijim povijesnim i prapovijesnim razdobljima. Pozornost se usmjeruje na činjenicu da je ranomoderni krški krajolik sličan obliku umjetne (kulturne) savane, kao izraz agro-silvo-pastoralnog sustava. Na kraju, dosad nepoznat statut sela Rihemberk (sredina 16. st.) potvrđuje i datira ciljane, održive šumarske djelovanja ruralnog stanovništva. Potkraj 19. stoljeća krški je ekosustav još uvijek bio vitalan i važan, dokazujući da ga je lokalno stanovništvo znalo eksploatirati, ali i sačuvati tijekom vremena, iako u modificiranom okruženju. Tradicionalni krški krajolik bio je rezultat racionalne upotrebe prirodnih bogatstava, temeljenih na ekološkim potencijalima i duboko ukorijenjenim lokalnim ekološkim znanjima, stavljenima u službu gospodarskog i društvenog sustava lokalnog stanovništva i njihovih vrijednosti i ciljeva.

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