

THE LANDSCAPE OF MARSHES IN THE LAND OF DORNA

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Abstract: This paper focuses on the landscape of marshes in the Land of Dorna, on the concept of landscape, as well as on the methods used in outlining its specific elements. The aim is to illustrate as accurate as possible the geographical reality of the Carpathian Mountains and to highlight the relationships between the natural and the anthropogenic environment. The outcome proved the veracity of the hypothesis made at the beginning of the study, that, in the end, the residents of the Land of Dorna have proved to be aware of the importance of the landscape of marshes, of its management and that, over time, they have managed to identify themselves with these sites, included in the perceived space.

Key words: The Land of Dorna, landscape of marshes, integration

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INTRODUCTION

There are numerous studies on the concept of landscape, both in the national literature and in the international one. This approach is an attempt to analyze the landscape of marshes in The Land of Dorna including the human component, and how it perceives this landscape. Thus, there are highlighted the types of landscapes existing in the territory, and the interrelation between the natural and anthropogenic components.

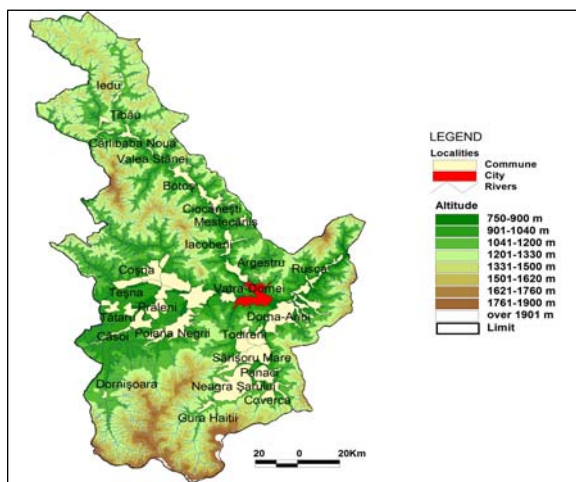


Figure 1. The map of the Land of Dorna

From the administrative perspective, the studied area consists of Vatra Dornei town and nine communes: Cârlibaba, Ciocănești, Coșna, Dorna Arini, Dorna Candreni, Iacobeni, Panaci, Poiana Stampei, Șaru Dornei (figure 1). Previous studies (Chiriță, 1998; Pop 1929, 1960) have revealed the impact of human activity on the landscape of

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marshes in the Land of Dorna such as: the eradication of some oligotrophic and eutrophic marshes, the extinction of some species of plants and animals, and the change in the land use for agricultural purposes etc. The most harmful effects on the landscape of marshes were registered in the period between 1920 and 1960 (Pop, 1960).

Presently, there is a noticeable change in the population's perception on the landscape of marshes in the Land of Dorna, proved by some concerns regarding the maintenance of some of its components, and a more reasonable use of resources than before.

CONCEPT AND METHODOLOGY

The main sources of information are the previous studies, completed with fieldwork. I will further clarify and present issues regarding the concept of landscape and the methodology used in this approach. Landscape has to be perceived both as objective reality because it contains tangible, measurable elements, and also as subjective reality in terms of individual and group perception of the studied phenomenon (Drăguț, 2000). Thus, Drăguț (2000, p. 14) defines landscape as “*a spatial structure expressed by its own physiognomy, individualized due to the interaction between abiotic, biotic and anthropogenic factors, valued differently, depending on how it is perceived.*”

Also, Rougerie and Beroutchachvili (1991) have considered landscape as a complex system whose organization is the result between natural and human associations. Landscape is more than a show, its hidden face being completed by mental images, as well as subject's knowledge and feelings. Thus, both definitions highlight the particular importance of the human perception of landscape. The human perception is the most important issue of the present study because it is relevant in order to explain the use of the landscape of marshes by the residents of the Land of Dorna.

Through methods like observation and regional analysis there could be observed the phenomena occurred in the Land of Dorna, the relationships established between its elements, the direction of the flows of matter, energy and information. The cartographic method, using GIS technology, was useful and resulted in several maps of the landscape of marshes in the Land of Dorna, and the satellite images (2011) helped to calculate the areas of some marshes.

THE LANDSCAPE OF MARSHES IN THE LAND OF DORNA

The landscape of marshes is the result of the fusion of certain natural elements: cold and humid weather, water excess and waterproof clay (Pop, 1960).

Marshes are “*unaired aquatic biogeographical formations, whose plants, instead of rotting or getting mineralized after death, are transforming into peat, eventually depositing on the bottom forming peat deposits*” (Pop, 1960, p. 25).

Hence, the Land of Dorna is known for these specific elements called marshes, either eutrophic or oligotrophic, which house species of plants and animals specific to the area, even relics. However, what is particular is how the residents of this area use these peat bogs.

The isolated *eutrophic marshes [bahne]* are represented by: the eutrophic marshes near Teșnița river, bahnele Bancului near Poiana Coșnei – wood marshes „*without pine trees*”, „*la Strugurelul*” - in Dorna Candreni; the deposit in Băile Candreni park; those on Negrișoara, Dorna, Neagra Șarului, Teșnița and Bancului rivers (the surface of the eutrophic marshes being reduced - about 15 ha, 2011). Eutrophic marshes cover and extend over a nearly flat surface, being scattered on the meadows of the frequently flooded streams and around their springs where the soil is rich in mineral salts. Their level of humidity depends on precipitation, groundwater and water from flooding.

This way, in this area a rich vegetation of herbaceous species is growing (*Sphagnum*, *Aulacomnium palustre*, *Carex stellulata*, *Viola epipsila* etc.) and wood species that form dense clumps [*huceaguri*] (*Betula verrucosa*, *Salix cinerea*, *Rhamnus frangula* and so on). From the economic perspective, peat deposits are not so highly valued, except from those soaked in mineral water located in Dorna Candreni (Pop, 1960).

The oligotrophic marshes [tinoave] develop in areas with wetter and colder climate, their water accumulation mostly being determined by precipitations. These have a poorer number of

flora species than the eutrophic marshes. Most of these are found in the area of Poiana Stampei commune and Coşna at an altitude of 810 - 920 m (Tinovul Jinului, Tinovul Mare Poiana Stampei, Tinovul de la Româneşti, Tinovul Şaru Dornei, Tinovul Poiana Stampei-Imaş, Tinovul "Magazia militară", Tinovul Colăcel, Tinovul Pilugani-Poiana Stampei, Tinovul Ciocăneşti-Botoş and other small isolated marshes) (figure 3).

Characteristic to the area of oligotrophic marshes in the Land of Dorna is the presence of pine woods, the total lack in *Calluna* species and the general lack in *Empetrum nigrum* species, which we can only find in Poiana Coşnei, and very rarely in other locations. Also, the flora species represented by *Dryopteris cristata*, *Padus racemosa* are to be found only in the area of Tinovul Jinului, these being specific to other oligotrophic marshes areas in the Carpathian Mountains.

Among the most common forest species that develop here we should mention: *Pinus silvestris*, *Betula pubescens*, *Populus* and *Picea excelsa*. Herbaceous vegetation consists of *Dryopteris cristata*, *Calamagrostis neglecta* and *Sphagnum cymbifolium sin. Sphagnum palustre* which is an arctic and subarctic relic.

In addition to these specific fauna and flora species, in this region there can be also found relics such as: glacial relics - *Sphagnum wulfianum*, *Schistostega osmundacea*, *Dinocharis intermedia*, *Macrobotus dubis*, *Formica picea fuscata* (Pop, 1960).

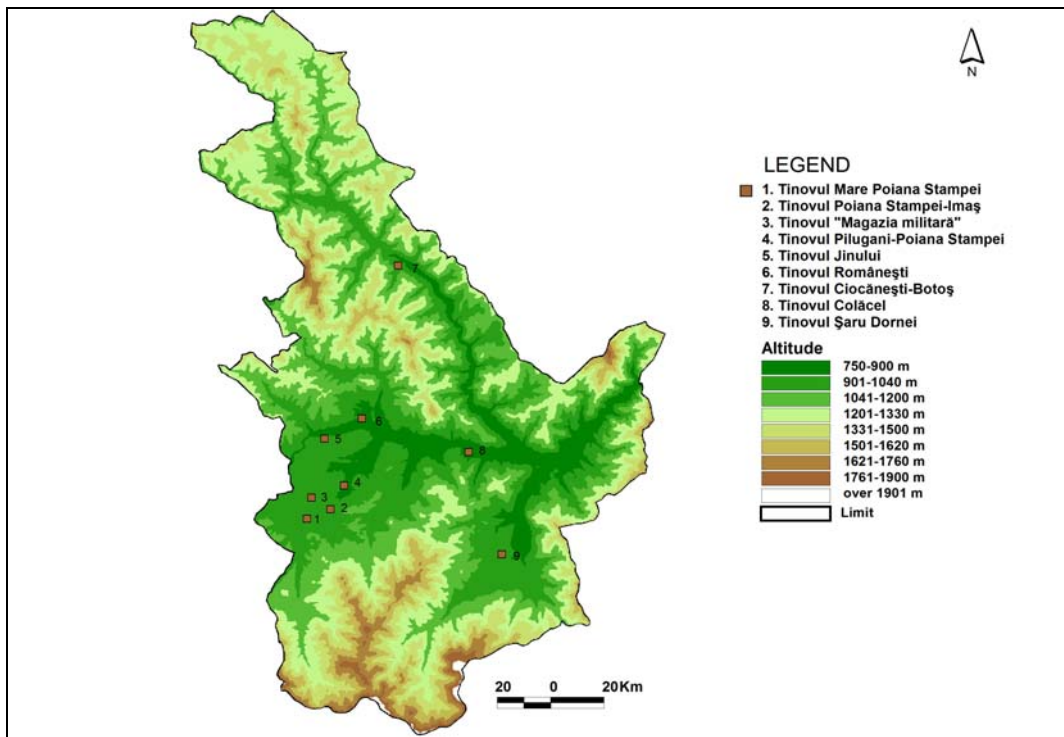


Figure 2. The map of oligotrophic marshes in the Land of Dorna

THE FUSION BETWEEN NATURAL AND ANTHROPOGENIC COMPONENTS. THE PERCEPTION OF THE RESIDENTS FROM THE LAND OF DORNA

This type of approach aims to distinguish the relationships established between the natural environment (marshes in the Land of Dorna) and the anthropogenic environment. The question is how the residents of the Land of Dorna perceive the landscape of marshes?

Starting from the statement of Farina and Belgrano (2006) who proved to support the importance of human component in the analysis of landscape, we have identified two major types

of landscapes of marshes in the Land of Dorna: the natural landscape of marshes and the landscape of marshes altered by human activities.

In the first category, that of *natural landscape of marshes*, we can include: the marshes (Tinovul Mare-Poiana Stampei N 47°16'43", E 25°4'59"; Tinovul Șaru Dornei N 47°15'24", E 25°21'20"; Tinovul de la Românești N 47°22'33", E 25°10'20"), sites which are currently protected by law, restricting any type of human activities, in order to protect the local flora and fauna.

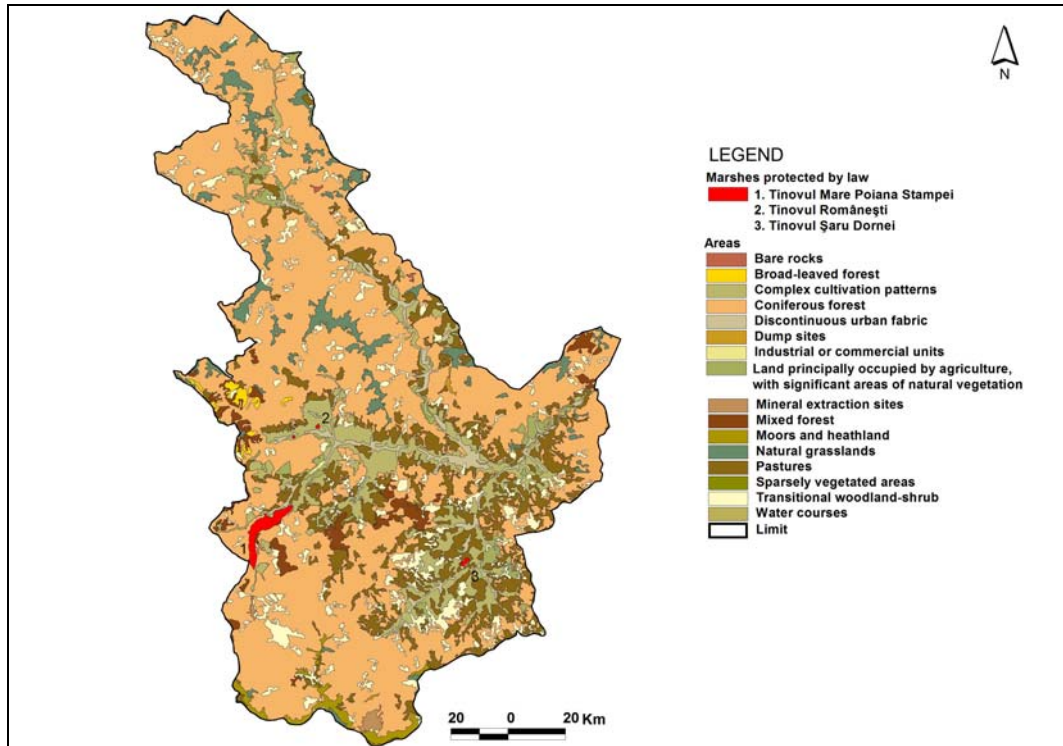


Figure 3. The marshes located in the Land of Dorna protected by law

In figure 3 there can be seen the marshes located in the Land of Dorna, protected by law in accordance with the provisions established by regulations such as: order no. 1964/2007, GEO. no. 236/2000 amended by Law no. 462/2001 with all subsequent amendments - OM 1198/2005, Law no. 345/2006, GEO no. 57/2007 and the list of protected natural areas established by the National Spatial Plan, section III, *Protected Areas*.

- the Scientific Reserve Tinovul Mare-Poiana Stampei (681.8 ha IUCN - International Union for Conservation of Nature category IV). It is the largest reserve of peat in the country, and it aims to maintain its components in a perfectly undisturbed natural state, any activities being prohibited except for research, education and ecotourism;

- the Nature Reserve Tinovul Șaru Dornei (36 ha, IUCN category IV). Its main purpose is to protect and preserve natural habitats and species, which are important in terms of flora, fauna, forest, hydrology, geology, speleology, palaeontology, pedology through active management measures; it has a lower level of protection;

- protected areas of community importance - Natura 2000 sites: Tinovul Românești (ROSCI0245, 20 ha), Tinovul Mare Poiana Stampei (ROSCI0247, 644 ha), Tinovul Șaru Dornei (ROSCI0249, 38 ha). These areas have various levels of conservation in accordance to the law. Besides the areas under special conservation, where any types of activity are

prohibited, other areas can be used for different purposes by custodians or land owners with the consent of the regulatory agencies.

In case of these units the physiognomy of the landscape of marshes has been only slightly altered over time. However, the other marsh areas, which have not been protected by law, have distinctly changed their physiognomy and use, therefore becoming *landscapes of anthropized marshes*.

The *landscape of anthropized marshes* in the Land of Dorna represents that landscape altered by human activities, either directly by changing its function through draining the marshes and turning them into hayfields or agricultural land and through clearing some species of wood, or indirectly by the domino effect – deforestation - extinction of plants, animals species and microorganisms - destruction of ecosystems - loss of resources for human communities.

- Over time, the human interference on the landscape of marshes has led to its significant alteration in some areas, the loss of species of flora and fauna and eventually to the destruction of ecosystems. According to the literature (Pop, 1960) and by calculating the size of marsh areas registered by the satellite images in 2011 there were identified the following changes in the landscape of marshes:

- due to excessive grazing and clearing of species of wood, the size of Tinovul Poiana Stampei-Imaş (N 47°18'27", E 25°08'59") has been reduced from 7 ha in 1960 to 0.3 ha in the present;

- the size of Tinovul "Magazia militară" (N 47 ° 18'47 "E 25 ° 07'03") has also been reduced from 10 ha in 1960 to 1.9 ha in 2011, due to drainage, deforestation and allotment for agricultural purposes and the species represented by *Sphagnum* flora also disappeared;

- Tinovul Pilugani-Poiana Stampei (N 47°20'63" E 25°09'81") has been intensively exploited since 1923 and used as a source of fuel and therapeutic mud especially for the spas in Campulung Moldovenesc. This resulted in the destruction of some species of plants and the sizably reduction of its surface (from 60 ha in 1960 to 2.2 ha in 2011);

- Tinovul Jinului (N 47°22'43" E 25°08'84") located near Jinului stream, has been reduced its surface from 10 ha in 1960 to 0.6 ha in 2011 due to overgrazing, drainage and deforestation. Its specificity, the vegetation of *Dryopteris cristata* and *Padus racemosa*, rare elements of the marshes in The Land of Dorna, were irreparably damaged by reducing its habitat;

- Tinovul Colăcel (N 47°20'23" E 25°18'69") intensively exploited by Vatra Dornei resort and spa since 1896, has undergone major changes: the destruction of some species of plants (*Pinus sylvestris*, *Vaccinium oxycoccos*), land degradation, the decrease of peat deposits through exploitation, the reduction of the area from 8 ha in 1960 to 0.35 ha in 2011. The size of the peat deposit located in Colăcel was of approximately 170,000 m³, and by 1940, about 130,000 m³ was exploited, thus leaving behind degraded land and the loss of a significant number of ecosystems.

The concept of landscape of marshes goes beyond the physical barrier, it representing an area perceived by the community. Nevertheless, it can be seen from a new perspective: a natural element that interrelates with the local residents, resulting in action. The use of resources provided by the landscape of marshes in the Land of Dorna is an ancient activity of the local residents (the exploitation of peat since 1896 for its use in mud therapy, as animal bedding, as fertilizer for agricultural land, used for combustion (with the ability to longer maintain the heat), or used in chemical industry.

According to Bader 1987, studies on the psychology of perception show that an individual perceives an object or a phenomenon both objectively through the physical presence of the object and subjectively through the image formed at emotional level. The subjective perception of the individual comes from the inherited cultural and imaginative past, its education, and even from the law (Drăguț, 2000).

If we analyse the behaviour induced by the law to the residents of the Land of Dorna, we will notice some differences. Thus, the protected areas in the Land of Dorna have not changed their physiognomy over time under the influence of human activities. The residents of this area understood the rules implemented in order to protect the natural areas, not interfering with them. However, their behaviour regarding the other marsh areas has remained destructive, due to the intense and unsustainable exploitation.

The closer the resources are located to human settlements, the more intensely they are used, this meaning that they are part of the perceived space of the population. Most marshes are found in the localities of Dorna Candreni, Românești, Podu Coșnei, Coșna, Poiana Stampei, Căsoi, Pilugani, Neagra Șarului, Șaru Dornei, Vatra Dornei, where the peat exploitation has been carried out for a long time, in some places the reserves being almost exhausted. Once the resources provided by the landscape of marshes are taken into exploitation, they become part of the individual, and the information about their use is spread within the community (Farina & Belgrano, 2006).

How the residents of the Land of Dorna perceive the landscape of marshes is also observed in the attribution of local names to the marshes. For example, Tinovul Jinului is located near Jinului stream, Tinovul de la școală is located near the school in Coșna, Tinovul “*Magazia militară*” is located near the military warehouse in Poiana Stampei, Tinovul from the “*hotelul comunal*” is located near the former local hotel in Poiana Stampei, Tinovul Colăcel is located at the foot of Colăcel Hill and so on.

The examples above respond to the enquiry initiated at the beginning of this study: how the residents of the Land of Dorna perceive the landscape of marshes? Starting with the attribution of local names to the marshes and with the resources these provide, and up to the protection of ecosystems and marsh landscapes all these are actions of the population in the Land of Dorna that confirm the perception of the landscape of marshes. These aspects confirm that the landscape of marshes is part of the perceived space of the residents of the Land of Dorna.

CONCLUSION

The human actions have changed not only the physiognomy of the marshes in the Land of Dorna, but also the structure and function of some of them, even leading to major changes such as the loss of important flora and fauna species. Over time, the local residents realized the importance of the landscape marshes from two perspectives: aesthetics and economy (land used for various purposes - agriculture, industry, tourism, trade), subsequently it becoming part of the perceived space of the population from the Land of Dorna.

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