

## THE IMPACT OF HUMAN INTERVENTION ON THE FOREST FUND WITHIN THE SOUTHERN PART OF DOLJ COUNTY

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**Abstract.** Under various aspects (statistical and spatial), we have managed to highlight the impact of human pressure on the natural biocoenoses. The impact of changes in the structure of the forest fund is even greater as the area under study lies in the Oltenia Plain, which is very important for the agricultural economy of the country. The changes that were registered in time in the structure of the land use mirror the important role of the forest fund, as the forest is the most efficient protective shield against various risk phenomena (floods, drought, deflation, erosion etc.). This study aims at presenting two different reference periods where can be observed spatio-temporal changes of forest fund and shelterbelts.

**Keywords:** forest fund, shelterbelts, Dolj county.

**Rezumat. Impactul intervenției antropice asupra fondului forestier din sudul județului Dolj.** Sub diferite aspecte (statistice și spațiale), am încercat să punem în evidență impactul exercitat de presiunea antropică asupra biocenozelor naturale. Impactul mutațiilor în structura fondului funciar este cu atât mai mare cu cât arealul de studiu este amplasat în Câmpia Olteniei, care are o importanță deosebită în economia agricolă a țării. Modificările înregistrate în timp în structura utilizării terenurilor, evidențiază importanța rolului dat de variabila fondului forestier, întrucât pădurea reprezintă scutul protector cel mai eficient împotriva multor fenomene naturale de risc (inundații, secetă, deflație, eroziune s.a). Acest studiu are ca scop prezentarea a două perioade de referință diferite unde pot fi observate modificările spațio-temporale ale fondului forestier și a perdelor forestiere de protecție.

**Cuvinte cheie:** fondul forestier, perdele forestiere de protecție, județul Dolj.

### INTRODUCTION

The forest fund includes the forests and wooded land that serves the needs for culture, protection or forestry administration. Regardless of the owner, public property (state and territorial-administrative units) or private property (persons or companies), the forest must be managed according to the wood regime, i.e. they must comply with a mandatory set of norms for their planning, culture, exploitation, protection and security. The terrains of the national forestry fund that are part of the public domain, are withdrawn from the civilian circuit, according to the laws in force; consequently, the property right is imprescriptible. The terrains from the private property forestry fund are and remain in the civilian circuit (source: Cadastral survey of the Forest Fund).

The area under study lies in the south of Dolj county (Fig. 1), mostly on sandy soils, where extensive works were carried on for land improvement, in order to raise the agriculture output. Following the stabilization of the sandy soils, they were gradually transformed due to intensive agricultural use, triggering changes in their natural equilibrium. Thus, vast areas of the forest fund were deforested, but there were also numerous phases of afforestation and deforestation (BADEA & GHENOVICI, 1974; GAVRILESCU, 1998; NUȚĂ, 2005).

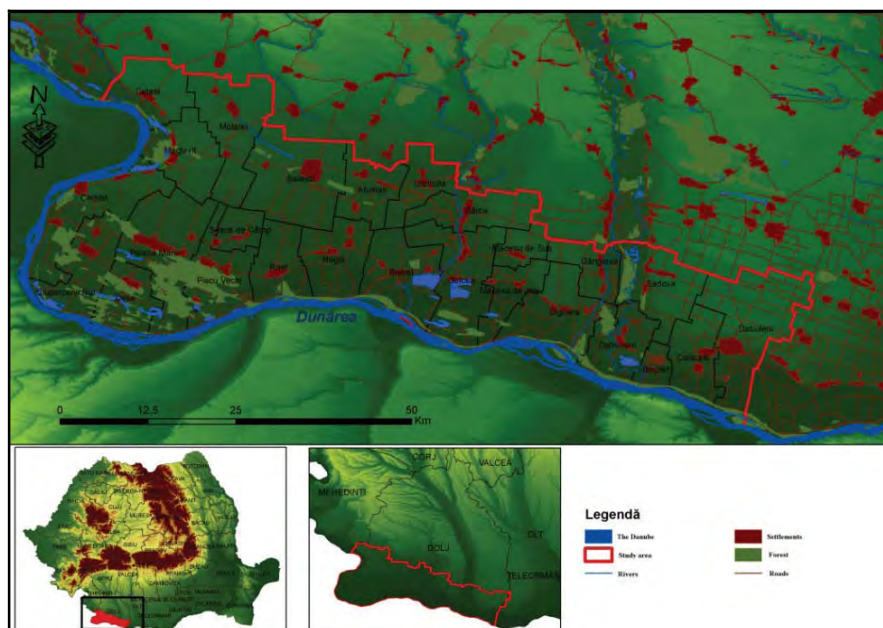


Figure 1. Location of the study area (original).

## MATERIAL AND METHODS

For this study we considered opportune and necessary to have a comparative analysis of the forest fund in 1970 and 2008, in order to identify the forest changes within the study area. The topographic plans achieved in the 70's were used as the cartographic support for representing the forest fund in 1970, while for the present period, in order to establish the area of the forest fund, the orthophotoplan at the scale 1:5,000 from 2008 was used.

## RESULTS AND DISCUSSIONS

Following the transformation from the year 1948, the forests that belonged to private and legal persons were nationalized without any compensation for the owners and without rendering void the title deeds, the state becoming the sole owner of the forest areas (source: Law no. 119/1948, published in the O.G. 133 bis/1948). After the fall of the communist regime in 1989, the new political parties shared two opinions on the ownership of the forest fund: forests should remain the property of the state or they should be restored completely to the rightful owners (CLEUGH, 1998; DUMITRAȘCU, 2006; MIHĂȘAN, 2009). From the spatial point of view, at that time the forest fund covered 225.4 sq. km (Fig. 2). The situation from 1970 is different, marking an increase of the vineyards and orchards, the former having a high share and important contribution for fixing the sands in the area.

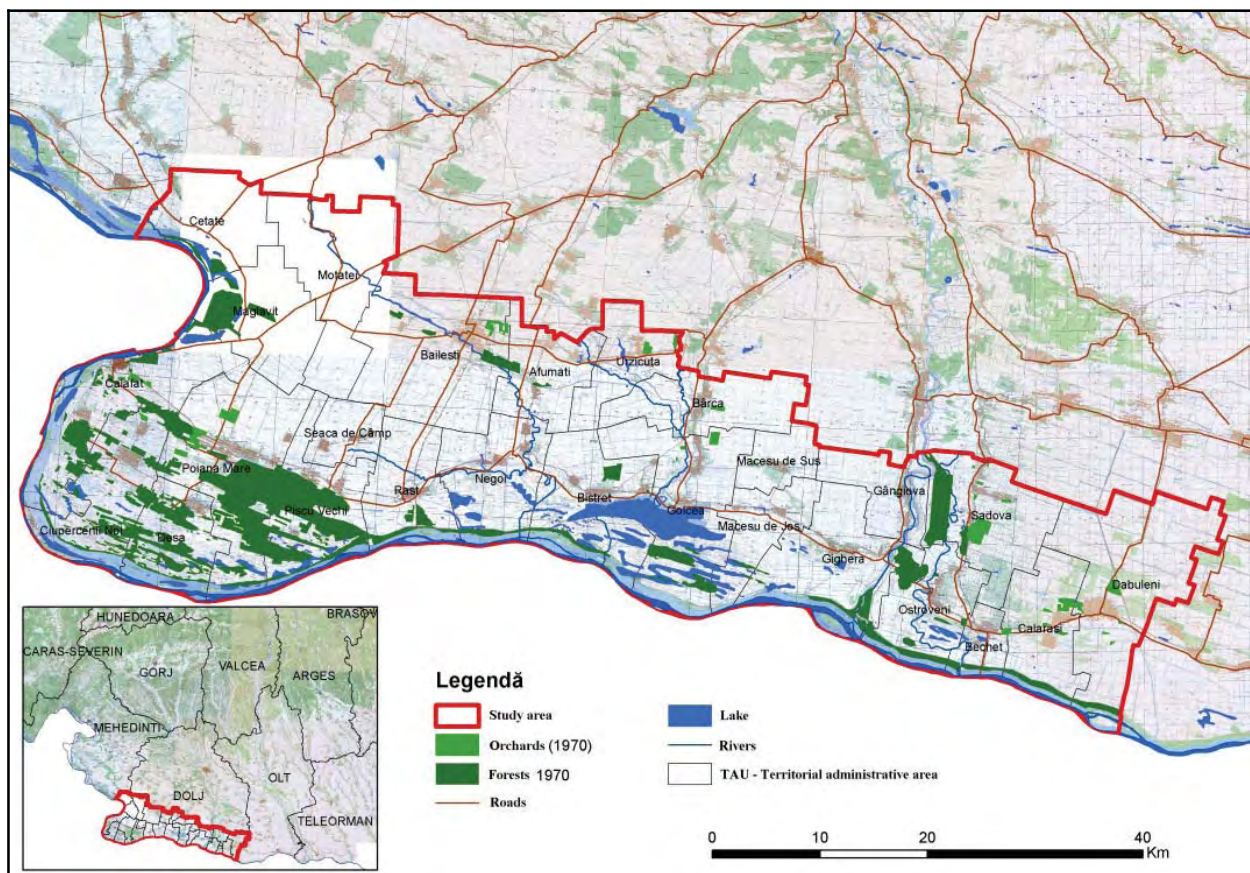


Figure 2. The situation of the forest fund in 1970, according to the topographic map at scale 1:50, 000 (original).

The forest fund significantly shrank due to the great delinquencies and infringement phenomena in the wood domain (forest offences) that took place after 1990, when there were changes in the property deeds of the forest fund.

A series of laws and government decisions was another decisive factor for the spatial variation of the forest fund, leading to forest disappearance on large areas. For instance, after 1962, following the decision no. 257 and 385/1962, the deforestation of the newly private forest fund, as well as the forest shelterbelts became a common practice. After 1970, shelterbelts were planted again, but the effects of the shrinking protective areas were obvious for the agricultural output, and to a lesser extent, for the communication lines or human settlements. After the forest was restored to the peasants, more and more people exploited the sandy soils, carrying on intensive agriculture; thus, many of the forest-belts for sheltering the soil and communication lines were destroyed by illegal cutting, their areas diminishing drastically.



There also appeared a great terrain parcelling, many parcels being subsequently abandoned due to the difficult maintenance and agricultural works. Moreover, the area covered by orchards and vineyards diminished considerably, almost to disappearance, as they were deforested or simply abandoned.

Still, there are not so major changes in the forest fund in 1970 compared to that from 2008 because many of these areas were kept intact, as they are part of the Natura 2000 protected areas, mainly the surfaces from the south-western part of the study area: Calafat-Ciuperceni-the Danube, the confluence the Jiu-the Danube, Dăbuleni-Grinduri, Ciuperceni-Desa and Bistreț. Moreover, after 1970, the areas with sandy soils were afforested and thus, in 2008, the forest fund covered an area of 220 sq. km (Fig. 3).

The protective forest plantations are represented by trees and/or shrubs that took different forms: massive, clumps, shelterbelts, etc. (CZEREPOWICZ, 2011; NUȚĂ, 2007), with the main aim of protecting crops against sanding, the sandy soils against erosion and surface deflation, the roads to avoid heavy snow accumulations, the irrigation canals and banks against river floods and human settlements against sanding, snow cover, reducing pollution and recreational role.

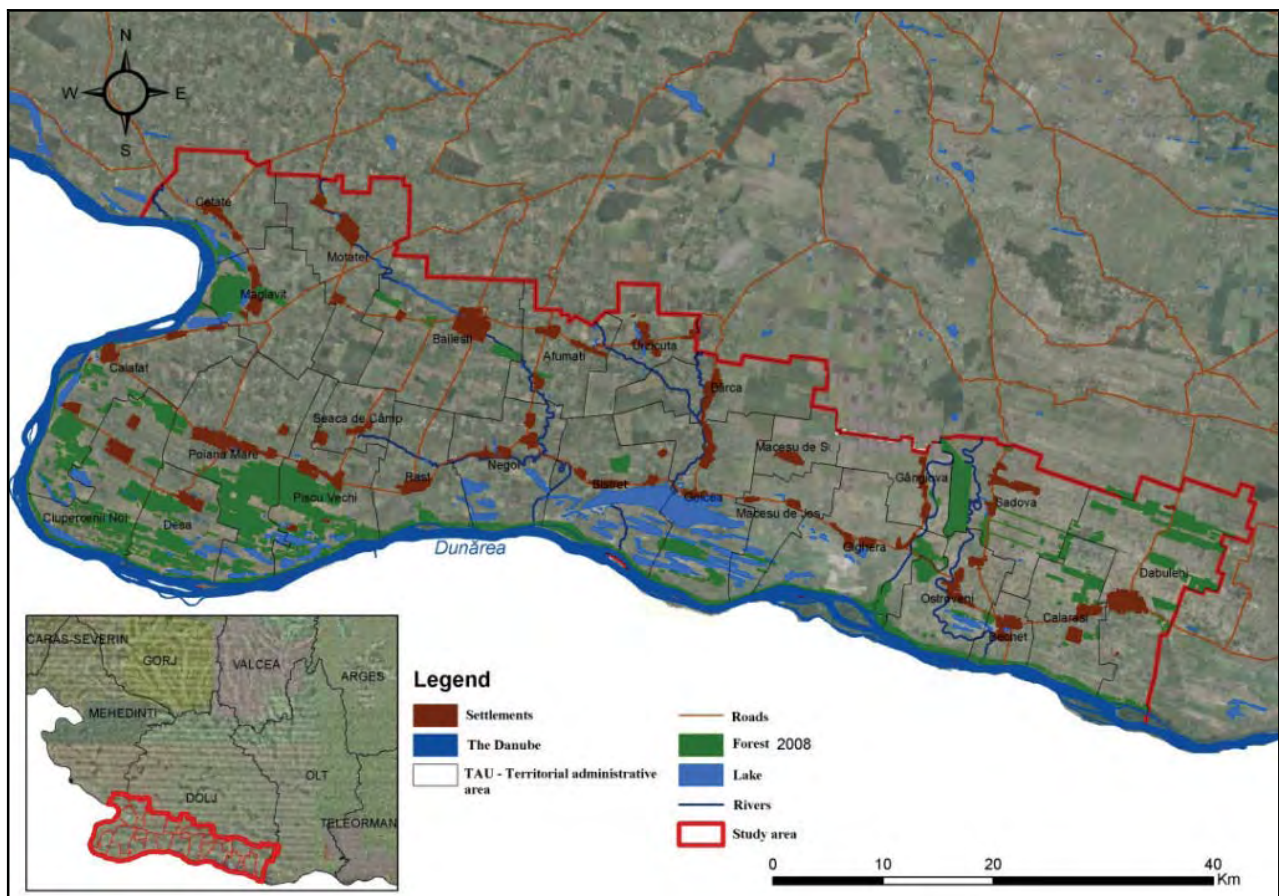


Figure 3. The situation of the forest fund in 2008, based on the orthophotoplan at 1:5,000.

They are located mostly on sandy soils over which there were executed land improvement works for practicing agriculture in good conditions but these have caused changes in the natural balance through the removal of large areas from the forest circuit, keeping only narrow strips in form of shelterbelts.

The cartographical materials used for the establishment of initial shelterbelts network was carried out by the Master Plans Drawing (1959) and topographic map from the 70's. After the 70's, the siting of shelterbelts was made in the hydro-complex arrangement Calafat-Ciuperceni and Sadova-Dăbuleni (Fig. 4) whose premise was to fix sandy soils and therefore increase the agricultural production. Shelterbelts length measured on the 1970 topographic map of the Calafat-Ciuperceni area was 70.4 km (21.4 km for the protection of settlements and roads and 50 km for the protection of agricultural field). For Sadova-Dăbuleni area, the length of shelterbelt was about 520 km both for the protection of roads and agricultural field.

To determine the length of the shelterbelts in 2008, we used the same criterion (delimitation of arable land, pasture, roads and irrigation channels where there are still shelterbelts); they are vectorized and measured on orthophotoplan at 1:5,000. For Calafat-Ciuperceni area the values show that the shelterbelt of human settlements and roads have decreased significantly, from 21.4 km to just 7 km, and those for arable land have decreased to 45 km, but with a high degree of dispersion and irregularity in the territory. In the case of Sadova-Dăbuleni area, the length of shelterbelt was about 450 km, which shows a decrease of shelterbelts areas since the 70's to 2008 (Fig. 5).

From a statistical point of view, it was necessary to have a quantitative and qualitative evaluation of the effects of the landscape changes following human activities. Consequently, the naturalness index was determined, using the statistical data from 2010, offered by the Regional Statistical bureau in Craiova. This index is designed to reflect the naturalness landscape in study area.

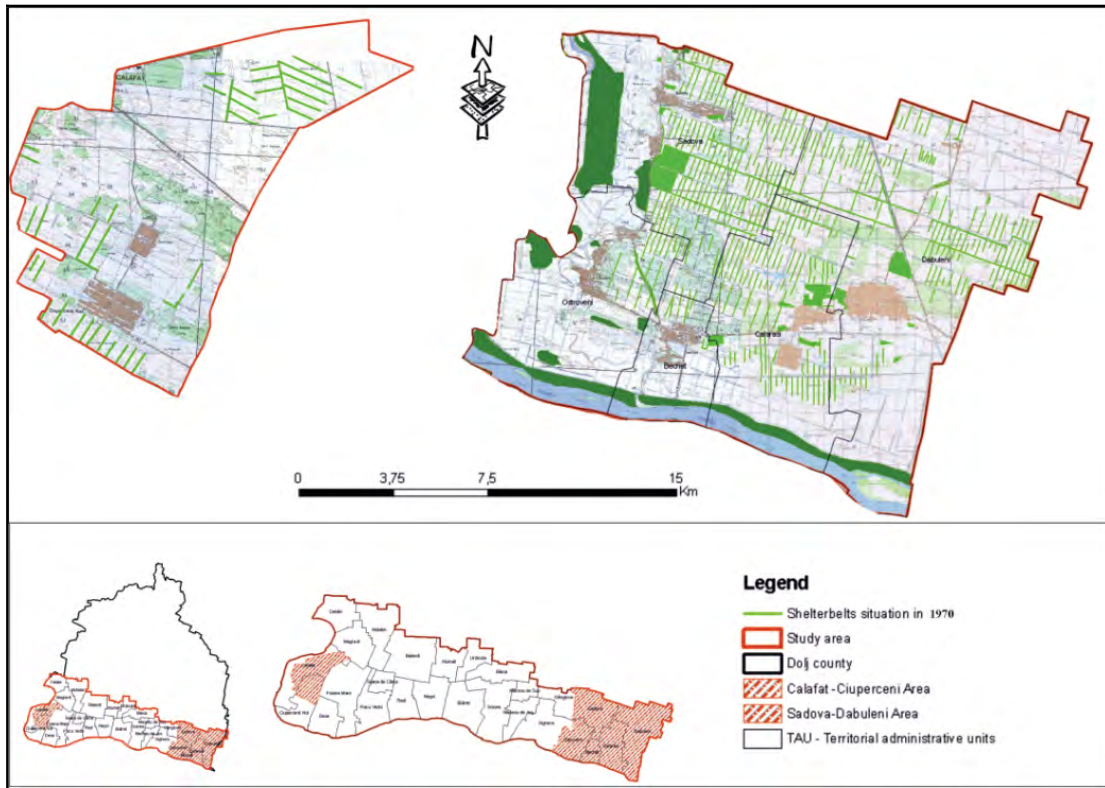


Figure 4. The situation of the shelterbelts 1970, according to the topographical map at scale 1:50,000.

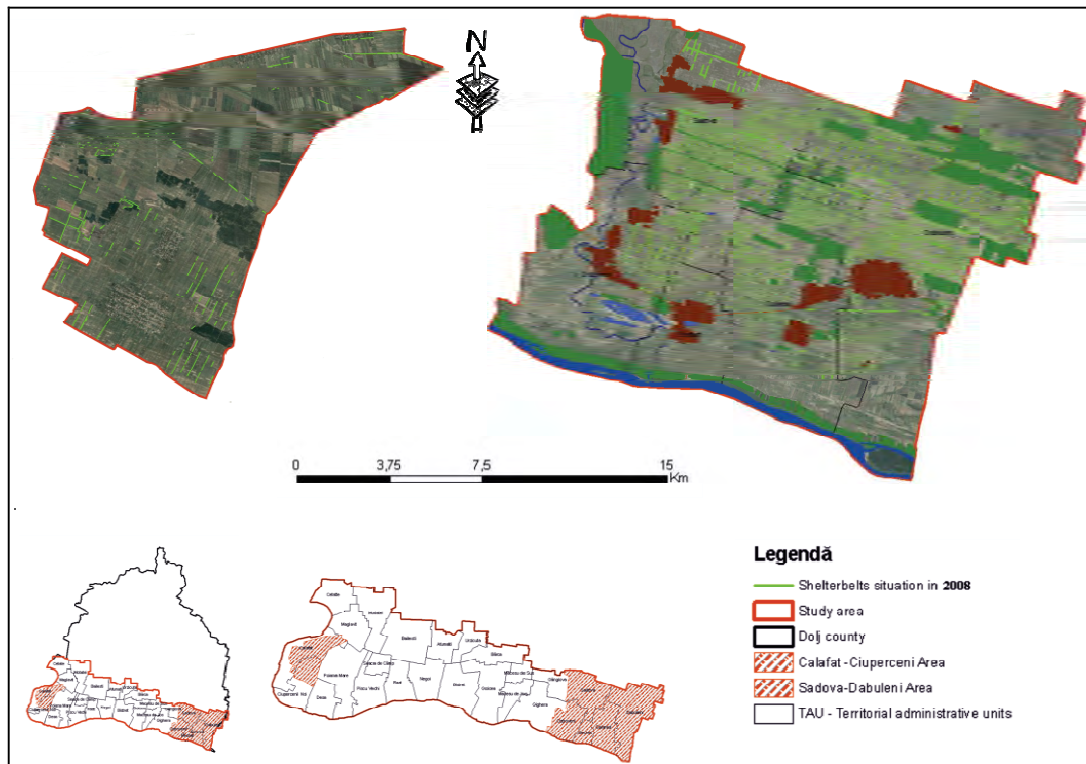


Figure 5. The situation of the shelterbelts in 2008, based on the orthophotoplan at 1:5,000.

Concurrent with the changes of the title deeds and organization of the agricultural practices, changes in the use of agricultural terrain also took place. The naturalness index expressed by the ratio between the land covered with forest and the total surface represents the dimension of the impact that the population has upon the environment (IORDACHE, 2009; PANAIT, 2010; PETRILĂ, 2011).

The values obtained by calculating this index for the Southern part of Dolj county emphasize a strongly affected status of the landscapes that can be classified as it follows: 0-5 %: landscapes with a balance entirely affected, which characterizes the northern part of the territorial administrative units, as: Moțăței, Seaca de Câmp, Afumați, Urzicuța, Bârca; 5.1-10%: with strongly affected balance specific to Măceșu de Jos, Ostroveni and Călărași communes; 10.1-20%: with moderately affected balance; 20.1 -30%: with weakly affected balance, specific for the southern part of study area; over 30%: with a very weak affected balance characteristic for Piscu Vechi (Fig. 6).

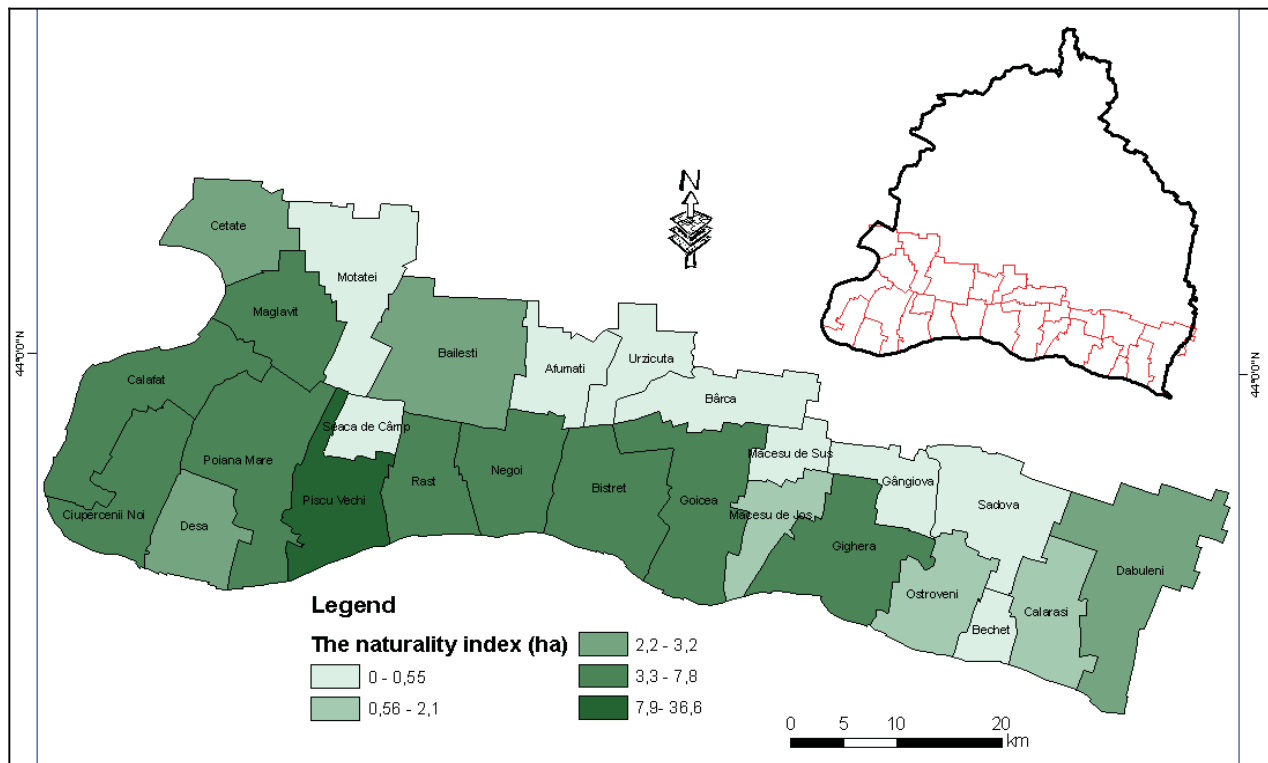


Figure 6. The naturalness index distribution for southern part of Dolj county.

## CONCLUSIONS

The lands from the study area were gradually subjected to changes induced by intensive agricultural use, thereby modifying large areas of forest on which it was intervened through numerous stages of afforestation and deforestation.

Through spatial analysis, we identified the areas of forest fund and the shelterbelts from 1970 and 2008, where it can be observed a more significant reduction of the surface with shelterbelts than the forest itself. The statistical analysis reflects the fragility of landscape highlighted through the naturalness index showing that the most of the administrative territory has a strongly affected balance of landscapes.

The existence of shelterbelts in areas with a complex features such as this, represents a primary objective in developing the strategic actions of EU Member States for climate change mitigation in agriculture.

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