

# **EVALUATING THE RELATIONSHIP BETWEEN DEFORESTATION – PROTECTED AREAS: A NEW APPROACH IN CASE OF EASTERN CARPATHIANS FROM SUCEAVA COUNTY**

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## **Abstract**

Protected areas, greenspaces are strongly influenced by deforestation and related human activities such as overexploitation, roads construction or natural disturbances (fires, snow-slides) which influence the stability of protected areas.

On the other hand, they have a negative impact on recreational activities. It is obvious that forest areas are important for human well-being, mental health.

The proximity of protected areas to certain cities and towns positively influences the ways of spending free time, but also the demographic aspects. Thus, the aim of this paper was to evaluate the relationship between deforestation and protected areas in Eastern Carpathians from Suceava County. We investigated the impact of deforestation in protected areas based on the fact that fragmentation of forests affects the forests ecosystem services. The results indicate that it is necessary to analyze and know the anthropic and natural factors which must be understood to maintain forest preservation and its sustainability.

**Keywords:** recreational activities, human well-being, deforested areas

## **Introduction**

Deforestation influences the climate by the fact that the increase in temperatures can increase the occurrence of forest fires and storms, but it also leads to a change in land use and desertification (Singh, 2022).

Forest cover expansion in European mountainous regions can be expected under all scenarios, with biophysical factors playing a key role in defining suitable locations and land use legacy playing a significant role in spatial patterns (Price et al. 2017).

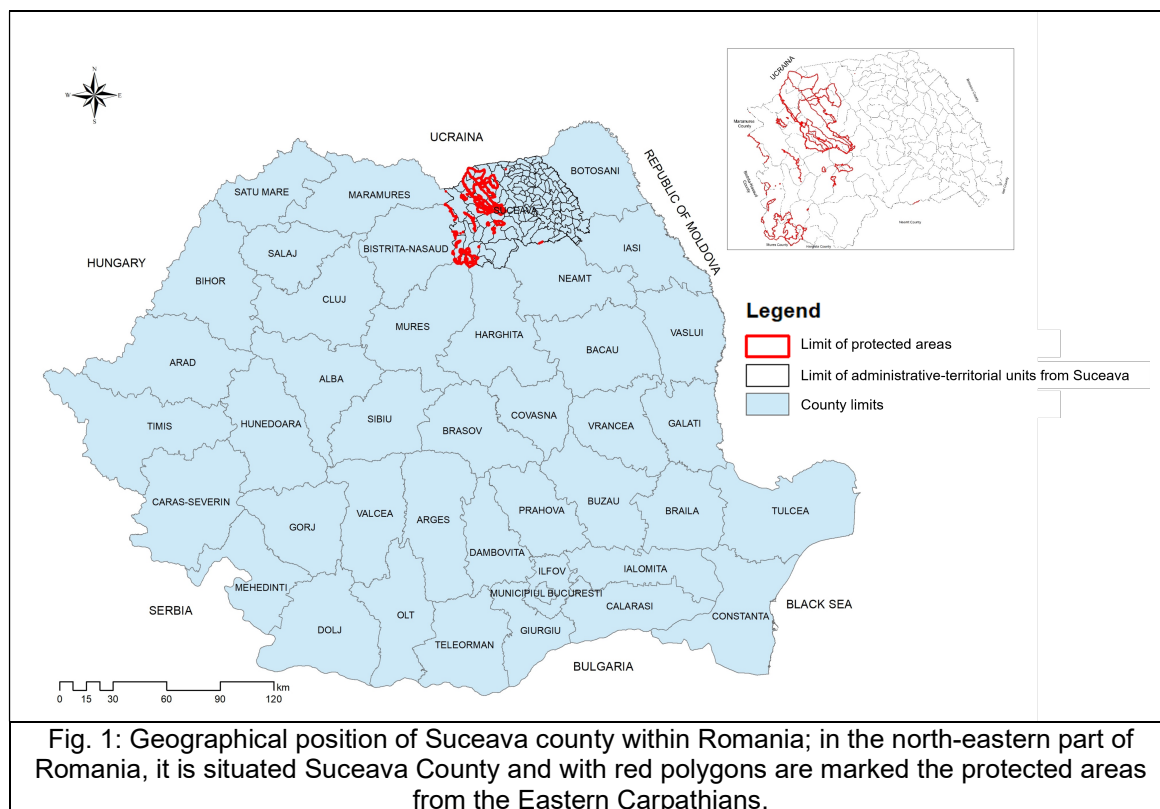
Protected areas in the Carpathian Mountains reduced forest disturbance by 1-50% in some countries, but their effectiveness varied across countries and time, with older areas being more effective in some countries (Butsic et al. 2017).

Researches showed the effectiveness of forest protected areas in preventing deforestation in mountainous regions (Gao et al. 2020).

We investigated the impact of deforestation in Eastern Carpathians from Suceava County based on the fact that fragmentation of forests affects the forests ecosystem services and forests stability.

## **Material and methods**

The analysis of deforestation in Eastern Carpathians from Suceava County was realised based on the use of Landsat-7 Enhanced Thematic Mapper Plus (Landsat-7 ETM+) images from Global Forest Change (GFC) from the University of Maryland (Hansen et al. 2013). Also, we made additional geoprocessing and spatial analysis on deforested areas and protected areas from the study area (Figure 1).



## Results

### Distribution of deforested areas in Suceava County

Suceava County recorded the highest rates of deforestation in Romania. In the mountain areas from the Eastern Carpathians are most deforested areas (Carlibaba – 4884 ha; Brosteni – 2902 ha; Poiana Stampei – 2707 ha; Pojorata – 2198 ha; Fundu Moldovei – 2144 ha) (Figure 2). The lowest rates are in the Suceava Plateau, on the eastern part of the county.

The largest protected areas located in the Calimani Mountains and Obcinele Bucovinei and here also are the administrative-teritorial units with the highest rates of deforestation as are mentioned in Table 1.

Deforestation recorded the highest rates in the Obcinele Bucovinei even if here are avifaunistic special protection areas and community protection site whose conservation measures on flora and fauna are significantly important to the maintenance of natural habitats. Small deforested areas are also present in the Rarau Giumalau Mountains and even in the Calimani Mountains which is affected by overexploitation, roads construction for forests exploitation.

## Discussion

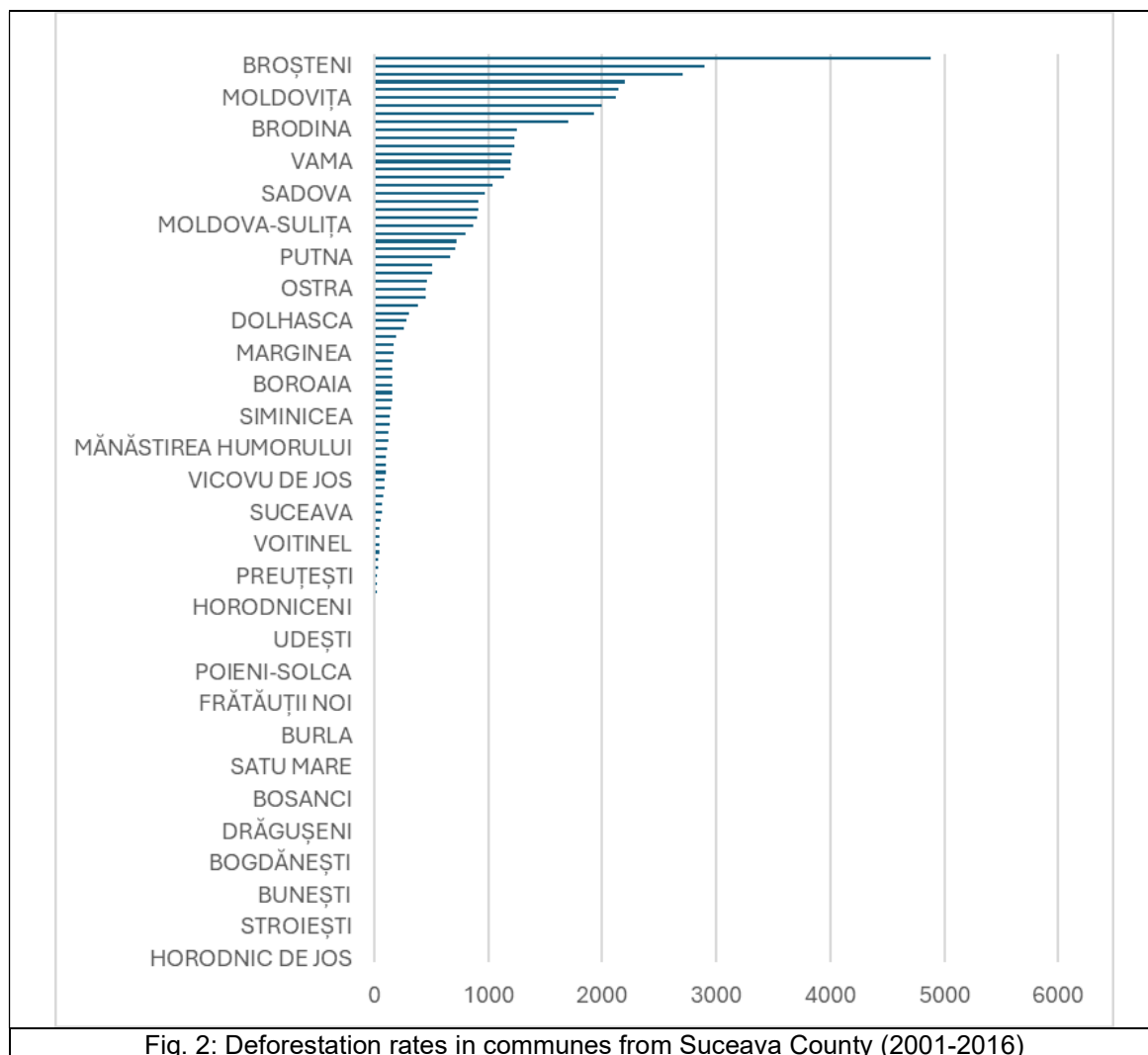
Protected areas from Eastern Carpathians from Suceava County are important to maintain the natural, ecological and climatic services of forests. Anthropogenic activities and natural hazards as flash floods or fires influence the forests fragmentation and theirs future sustainability. Also, we concluded that the ecosystem services offered by protected areas are vulnerable to human activities.

## Conclusion

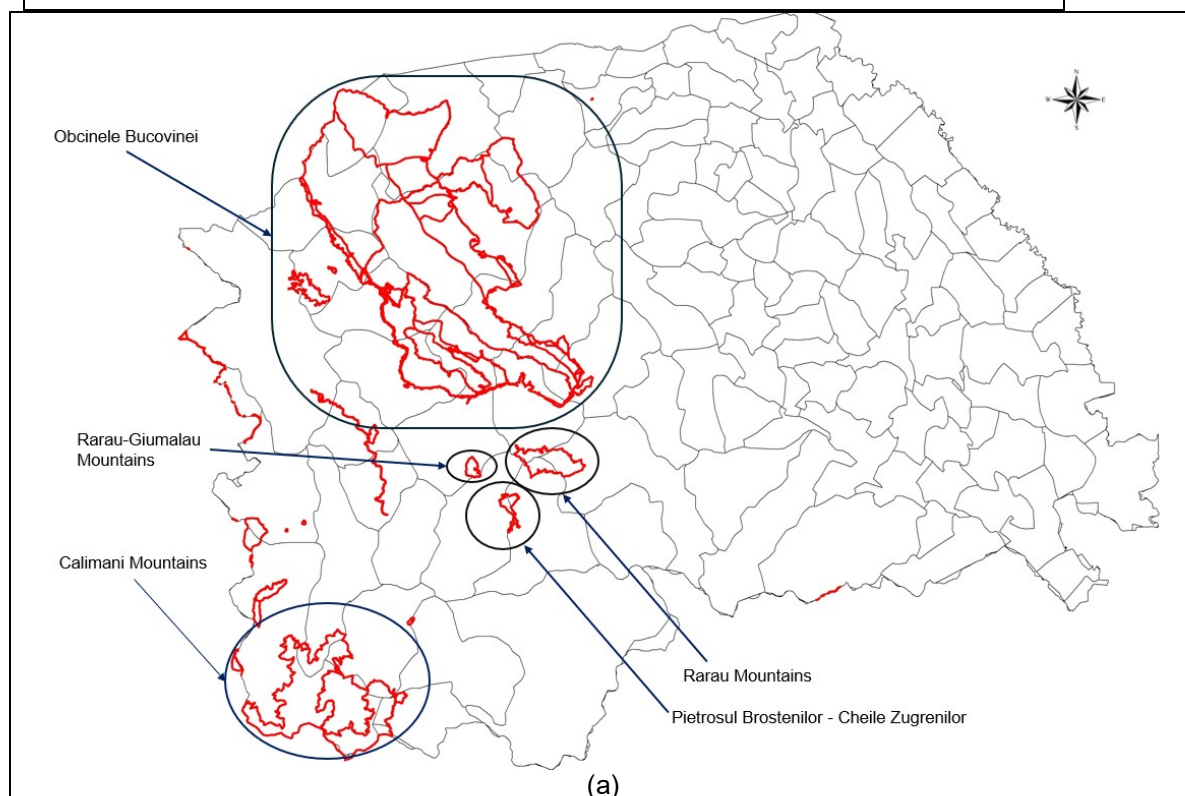
This paper demonstrated that is needed future strong management measures to protect the fragile environment from Eastern Carpathians especially from protected areas. The increased rates of deforestation from 2001-2016 demonstrated that the forests degradation and stability are threatened.

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The name of the locality (administrative-territorial unit)	Deforested areas (ha.)
CÂRLIBABA	4884
BROȘTENI	2902
POIANA STAMPEI	2707
POJORÂTA	2198
FUNDU MOLDOVEI	2144
MOLDOVIȚA	2115
DORNA-ARINI	1999
ȘARU DORNEI	1926
PANACI	1706
BRODINA	1250
IZVOARELE SUCEVEI	1229
DORNA CÂNDRENIOR	1226
COȘNA	1205
VAMA	1200
VATRA DORNEI	1198
Source: Data obtained from Hansen et al. 2013.	



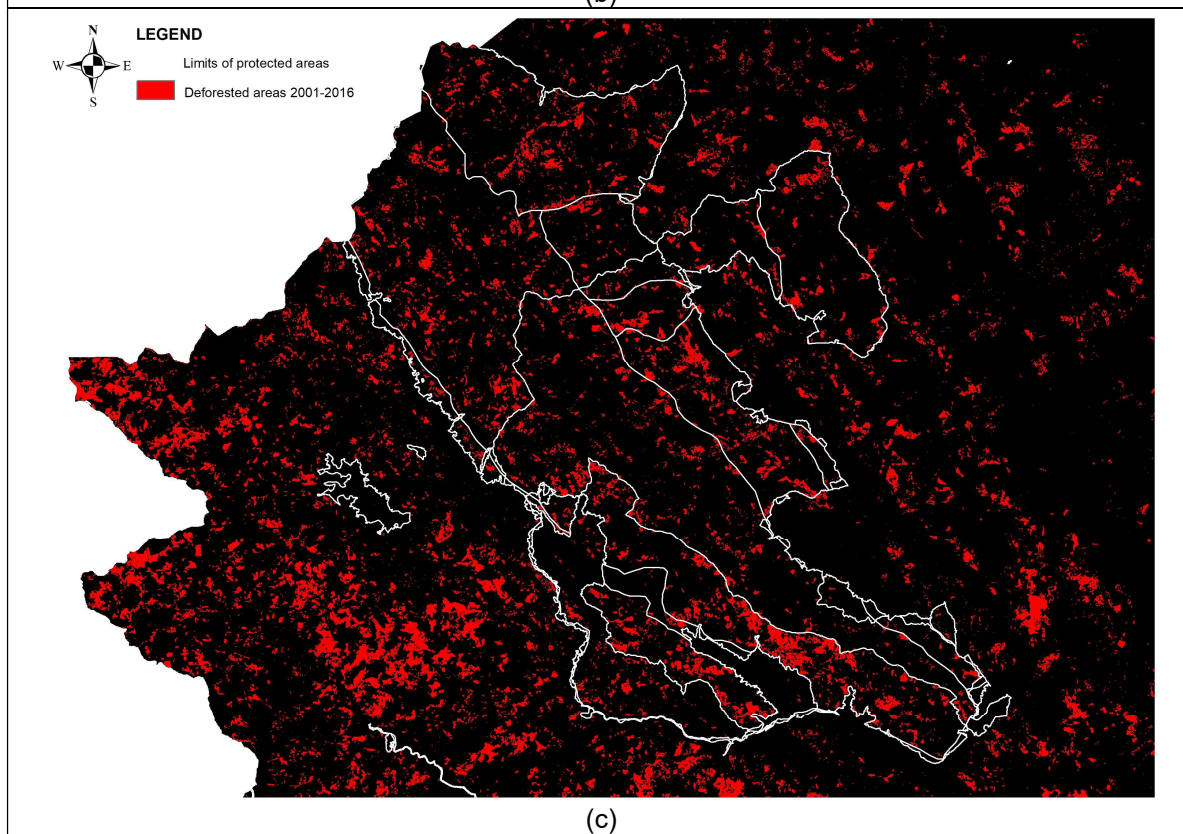
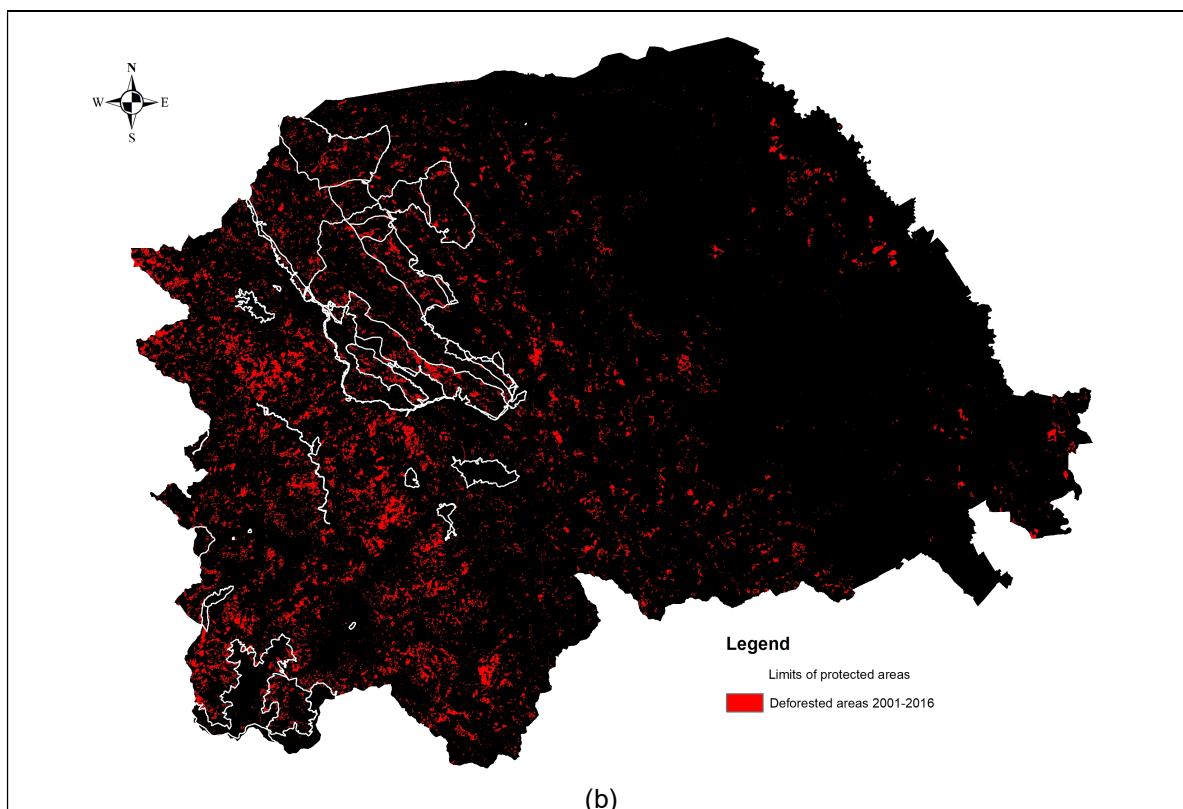


Fig. 3: (a). Protected areas from Eastern Carpathians from Suceava County; (b). Deforested areas in Suceava County 2001-2016; (c) Focus on deforested areas from Obcinele Bucovinei;

## **Souhrn**

Chráněná území, zelené plochy jsou silně ovlivněny odlesňováním a souvisejícími lidskými činnostmi, jako je nadměrná těžba, výstavba silnic nebo přírodní disturbance (požáry, sesuvy sněhu), které ovlivňují stabilitu chráněných území.

Cílem tohoto článku bylo tedy zhodnotit vztah mezi odlesňováním a chráněnými územími ve Východních Karpatech z okresu Suceava. Zkoumali jsme vliv odlesňování na chráněná území na základě toho, že fragmentace lesních ploch ovlivňuje ekosystémové služby lesů. Z výsledků vyplývá, že je nutné analyzovat a znát antropické a přírodní faktory, které je třeba pochopit pro zachování lesů a jejich udržitelnost.

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