

ANTHROPOGENIC PRESSURE ON FORESTS IN ROMANIA

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Abstract:

Forests are one of the richest ecosystems in terms of biomass stock and this potential is augmented by a broad range of ecosystem services that contribute to human wellbeing by protecting air from pollution, soil from runoff, landscapes from flooding and landslides. This high economic and ecologic potential is well acknowledged, but in specific circumstances short term gains resulting from the valuation of wood or from conversion of land to other uses are prevailing and create powerful incentives for overexploitation or deforestation. The anthropogenic pressure on forests was and continues to remain high at global level, although there are states where it was successfully controlled. Nevertheless, the forest cover is shrinking increasing the associated threats that result from the cancellation of the forests' ecosystem services. Of particular importance in the current context is the reduction of forests' carbon sequestration potential, which is of crucial importance in climate change mitigation. The patterns of unfavourable circumstances are analysed in order to outline the most important challenges of forest management in Romania, but also the impact of novel ecosystem service based economic tools that are aimed to strengthen the incentives for sustainable forest management and to avoid conversion of forests to other land use types.

Key words: forest, sustainable use, FSC certification, payments for ecosystem services, Romania

JEL classification: L73, Q23, Q57

INTRODUCTION

Each inhabitant of the Earth enjoys the benefits of 0.6 hectares of forest resulting in a total area of 4 billion hectares (FAO, 2010). This represents almost one third of the land cover, being significantly less than the area covered by forests naturally. Deforestation went along with the expansion of the human habitat and it was determined by the need of space for settlements, cropland and pastures, and infrastructure, but also for fuel wood and for providing economy with a versatile raw material with a wide range of uses departing from building material and ending up with a multitude of products such as furniture and components in various devices. The process is continuing nowadays at rates that are considered alarmingly high, although they are slowing down gradually (FAO, 2010; Petrescu, 2009). An important economic sector that both benefits and threatens forests is tourism. In recent years the high dynamic of this sector created a great pressure on forest areas especially in mountain regions (Hapenciuc et al., 2009; Nastase, 2007).

In specific circumstances the short term gains from deforestation are powerful enough to outrun the long term benefits. These gains are resulting from wood harvesting, but also from land use change. Their strength is determined by the discrepancy compared with the gains that could be obtained by maintaining the forests. The underlying cause of this discrepancy is to be found in the patterns of the economic system that fails to reward appropriately the contribution of forests to human wellbeing by the protection of air, waters, soils, and biodiversity. Since policy measures applied for forest protection and encouragement of sustainable management failed to withstand the economic pressure in many cases, the economic research focused on this area and designed a range of ecosystem service based tools that are aimed to create short term gains as incentives for the sustainable management of forests (Ioan, 2014; Esi and Nedelea, 2014). Their application has a short, but intense history that provides meaningful insides for both policy making and business cases.

Romania has a forest cover that totals almost 6.5 million hectares. It comprises mostly managed forests, but also primary temperate forests, accounting for around 0.2 million hectares (Bran et al., 2012). It represents not much above a quarter of the country's area, which is less than the proportion recorded at European and world level. The changing legal framework of the last two decades created circumstances that increased the incentives for deforestation and illegal logging that affected almost 0.5 million hectares (Roman et al., 2008). Are the current policy measures effective enough in controlling this process is the question that will be addressed. The analysis of economic and forestry data regarding Romania's forest cover will provide some insights in this respect and these will be interpreted by considering the provisions of European and national programs.

DRIVERS OF FOREST COVER REDUCTION

The drivers of forest cover reduction are basically the same with the historical ones, valuable information for improving the knowledge base for policy support being given by data on their current size, relative proportion, dynamic and trends. A closer look to global trends allows depicting the current status of these drivers and a good starting point for analysis at lower spatial scales. Hence the drivers of forest cover reduction include land use change, production of wood and non-wood products, and natural hazards and will be analysed by using global level data reported by FAO (FAO, 2010).

At global level the main driver of forest cover reduction is the trade-off between forests and agriculture, while the net loss is reduced by afforestation and natural expansion of forests. In the last decade land cover change accounts for the loss of forests on 13 million hectares per year. Almost half of it is offset, resulting in a net loss of 5.2 million hectares. The process of land cover change is occurring especially within the area of tropical forests. In some regions there are signs of decreasing, but it remains high in others. For instance, South America loosed about 4.0 million hectares per year between 2000 and 2010, while in Africa the rate is of 3.4 million hectares per year.

Production of wood and non-wood products could also lead to the reduction of forest cover in case that their regeneration capacity is exceeded. Almost one third of world's forests are managed for production purposes, meaning 1.2 billion hectares. The same purposes are pursued in the so called multiple use forests. The total wood yield of forests is 3.4 billion cubic meters per year, but this amount does not account for illegally removed wood, especially as fuel. The ratio between the use of wood a raw material and as fuel is almost even. In value, the removed wood accounted for 100 billion USD per year representing the value of raw material as industrial round-wood. The world trend of round-wood prices is downward. Most of the fuel-wood's value cannot be captured in statistics, since it is collected by individual users. As long as non-wood products are regarded, their value is estimated to be around 18.5 billion USD per year and it is based mainly on food products. This should be considered only a fraction of the total value since many data is still missing, especially for the subsistence use of non-wood forest products.

Natural hazards of many types are inflicting on the health of forests determining also the reduction of the forest cover. These include specific ones like wildfires, insects, pests, and invasive species, more or less related with human activities, but also general ones like severe storms, blizzards, and earthquakes. Annually 35 million hectares are damaged by pests and insects, most of this area being in the boreal and temperate climate. In Canada only an insect destroyed 11 million hectares in two decades. Wildfires cause damages for around 40 million hectares each year especially in Africa and Australia.

ROMANIA'S FOREST COVER: STATE AND CHALLENGES

Romania's forest cover accounts for a little above a quarter (26.8%) of its territory, representing almost 6.5 million hectares (6399501 hectares). The standing Woodstock is estimated

to be of 200 cubic meters per hectare, with an annual growth of 5.6 cubic meters. The National Directorate of Forests reports an annual yield of around 9 million cubic meters of wood, harvested on the area in public property, representing almost 75% of the total volume that is approved to be removed.

The forest cover is organized considering a range of criteria such as relief, species composition, function, age, and ownership.

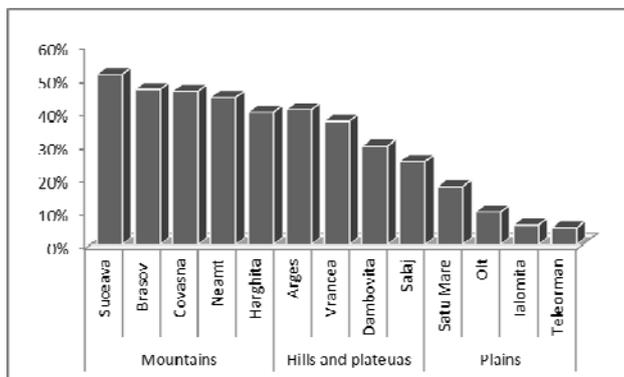


Fig. 1 Proportion of forest cover by relief types in selected counties

Source: INS data processed and represented by authors.

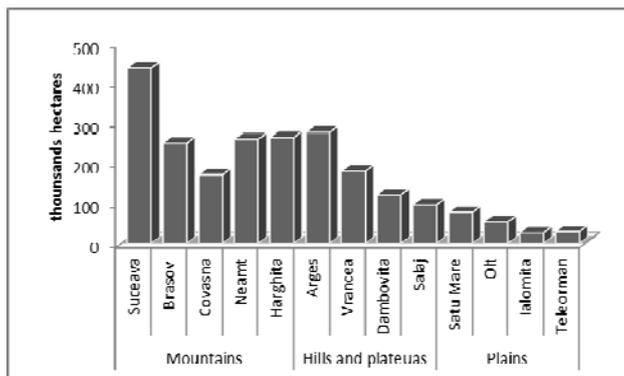


Fig. 2 Area of forest cover by relief types in selected counties

Source: INS data represented processed and represented by authors.

Forests are unevenly distributed with respect to the relief, most of them (66%) being in the mountain area. In fig.1 there are presented selected counties representative for the main relief types according to the proportion of forest cover from their territory. In counties where mountains are prevalent this proportion is higher, accounting for almost half of even more of their territory. The total area of forest of the considered counties also shows how the relief type influences distribution of forest cover (fig.2).

The structure of forest cover by species composition is in relation with their distribution by relief types. Hence the forests dominated by coniferous species and beech (species of the mountain region) are prevalent accounting for more than half of the total forest cover (58%). The entire structure of forest by species is presented in fig.3.

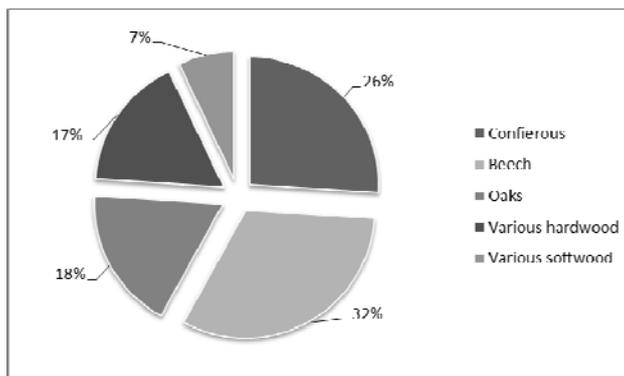


Fig. 3 Area of forest cover by relief types in selected counties

Source: RNP data represented by authors.

Most of the forest (58%) is falling in the first functional group, meaning it is managed mainly for the harvesting of wood and non-wood products.

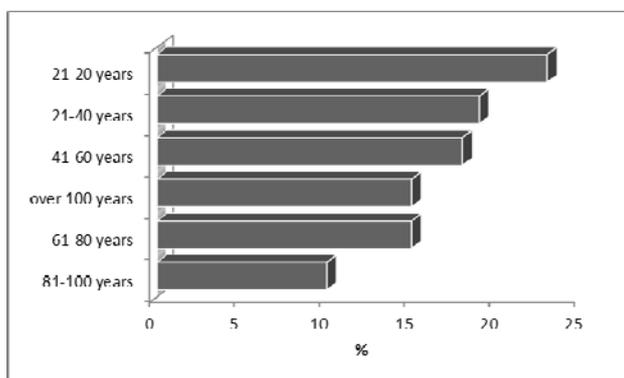


Fig. 4 Area of forest cover by relief types in selected counties

Source: RNP data represented by authors.

By age, it could be stated that most of the forests are young forests since forest with age under 60 years accounts for 60% of the total area while forests over 100 years represent only 15% (fig. 4).

As long as ownership is regarded, the forest cover is almost evenly divided between public and private proprietors. Thus the National Directorate of Forests (RNP) manages 3.2 million hectares. The rest is owned by private proprietors who obtained their titles in three stages, as follows:

- Application of Law 18/1991: 355715 hectares;
- Application of Law 1/2000: 1890899 hectares;
- Application of Law 247/2005: 924980 hectares.

The changing legal framework regarding forest ownership had a great impact on forest cover despite the fact that the ownership does not change the patterns of the forest management. Thus, all forests, regardless to their ownership, are part of the national forest area and should be managed in accordance with the provisions of forestry legislation.

Nevertheless, some management tools cannot be applied properly since they are designed for certain timeframes and sizes of forest units. Thus, the management plan of forests is elaborated for a period of at least 10 years and it should cover an area of at least 100 hectares. The forest ownership does not always respect the second condition, fact that hinders the application of the managerial measures needed for ensuring their productivity in accordance with the potential.

- 2013: SA-FM/COC-004023 for an area of 1668103 hectares.

In case of private forests the certification process is slower. Further, media reports brought proves that even of certified areas deforestation could occur.

Ecosystem service based tools are less developed but there is a high confidence worldwide and especially in Europe that they will be more effective in fostering sustainable management of forests. The most common tools is the payment for ecosystem services (PES) scheme that allow owners to gain incomes for services such as watershed protection, carbon sequestration, biodiversity conservation, flood protection etc. The current National Program for Rural Development already comprises measures that are designed as PES, although other applications are less employed (Morosan, 2013). The main issue that prevent a wider application is the difficulties of assigning economic values for each ecosystem service and the initial funding. Where such barriers were overcome PES significantly improved forest protection. For instance, in Japan, each local authority perceives a tax of 5-10 USD/inhabitant and 100-800 USD/business in order to fund the restoration and sustainable management of forests. The incomes are used to reward forest owners that maintain forests for at least 10 years.

CONCLUSIONS

Forests are a treasure of our planet gathering most of its biodiversity and valuable natural resources, meanwhile having a crucial contribution for the health of the global ecosystem. Despite widespread acknowledgment of their importance forests continue to shrink at alarming rate under anthropogenic pressure by means of land cover change, overexploitation and natural hazards amplified at some extent by humans.

In Romania the loss of forest cover could be considered the largest environmental threat since in the last two decades were recorded important losses of forest cover, while the remaining forests are exposed to overexploitation. These are determined by the failure of the current legal and institutional framework to withstand the pressure of powerful economic incentives brought by short term gains earned from wood harvesting and/or land use change.

Sustainable forest management could be fostered by expanding the certification of forest products, but also by designing ecosystem service based tools. The first category is already employed in Romania, but it covers mainly state owned forests that represent only half of the total forest cover. Ecosystem service based tools have a good potential to foster sustainable forest management although their applicability is hindered by technical and financial restrains.

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