

# Representative Policy Actions Linked to Burned Forests in Northern Evia: A Short Contribution to the Public Debate

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## Abstract

The structural problems of the Greek forest sector cannot be resolved quickly, but require rather a thorough reassessment of policies, a more wide-ranging vision, and the inclusion of new parties, such as the energy industry based on bio-economy, in the policy planning process. The forest sector in Evia is characterized by problems that concern almost the whole country regarding main harvests and forest exploitation. As was expected, these forests are directly related to the local economy and the national economy in general. These problems became greater, after the large wildfire in August of 2021. In several local communities, the percentage of their area that has been burned exceeds 80% and reaches up to 100%. This study summarizes a development-oriented SWOT model and some representative policy actions aiming to the socio-economic development of the area, beneficiary for the forest ecosystems and the local communities as well.

## Keywords

Evia, wildfires, forest sector, SWOT, forest policy

## 1. Introduction

Vertical axis 1 of the National Forest Strategy No. 170195/758 1 [1], included in the Greek Forestry Strategic Development Plan 2018–2038 for forests, is focused on the national forest economy, characterizing it as a pillar of the country's future development and outlining objectives and actions for achieving this role. The economic importance of forests and the opportunities provided for income creation are emphasized. Reference is made to timber and the chain of businesses that may be associated with it, as well as to the importance of non-timber products and ecosystem services. In addition, it is underlined that most non-wood products (resin, mushrooms, honey, aromatic and medicinal plants, etc.) are produced through an outdated institutional framework that does not promote their systematic exploitation and integration into relevant product markets. Nevertheless, during the last decades, the investment in forest production in Greece appears to be a side issue with decision makers showing no intention to change this shortcoming [2]. The literature also notes that, at a national level, much of the existing industrial wood processing capacity is not currently fully utilized. Increased domestic production of all categories of products and effective marketing would gradually reduce imports and the trade deficit [3]. At the same time, there is a tendency for occurrence of large wildfires, and devastating fire seasons every few years. Forest fire disasters, like the one in Northern Evia in August 2021, should ring a bell pointing to the need for the development of a comprehensive, science guided national strategy, for tackling this problem. Xanthopoulos et al. [4] summarize very effectively the related literature and conclude that such large fires do not only have devastating effects on vegetation, soil erosion, flooding [5], water quality [6], carbon sequestration [7], etc. but they also upset the

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economy, function, and psychology of local societies [8,9]. The implementation of the directions given by the National Forest Strategy as well as their specialization for the region of Northern Evia after the mega wildfire of summer 2021, is the only way forward.

## 2. Forest Sector and Resin Production in Evia Island

### 2.1. The Forest Sector

The forest sector in Evia is characterized by the problems that the sector faces over most of the country and concerns the main harvests in productive forests. These forests are directly related to the local economy and the national economy in general. Regional development is not successful without considering the contribution of forest-dependent communities and the domestic development of forest ecosystems. These ecosystems should offer employment and a stable income in semi-mountainous and mountainous areas while offering ecosystem services to society. Sustainable forest management ensures forests' vitality and durability, but also contributes to regional development. Across the prefecture of Evia, before the fire, forests covered about 26% of the surface, with a public to non-public ratio of approximately 2:8. Industrial forests (those that produce marketable wood products other than firewood), accounted for 31.4% of that area [10]. In addition, the prefecture of Evia was covered by the largest area of mainly Aleppo pine (*Pinus halepensis*) and secondarily Brutia pine (*Pinus brutia*) (15.74%) of all the prefectures of the country, most of which were industrial forests. Specifically, for Aleppo pine forest, before the 2021 fire it occupied an area of 85,145 ha in Evia, representing ~ 74% of the total forest cover of the island, growing in excellent environmental conditions for the species [11, 12].



**Figure 1:** Forest burnt area in the line of olive trees, near the area of Limni. (Source: author's personal archive)

The same inventory [10] estimated a total volume of industrial timber for the forest department of Limni of 874.370 m<sup>3</sup>, of which 825.874 m<sup>3</sup> were conifers and 48.496 m<sup>3</sup> were broadleaves. Respectively for the Istiaia area, the estimated total volume was 532.613 m<sup>3</sup>, with 365.864 m<sup>3</sup> of conifers and 166.749 m<sup>3</sup> of broadleaves. In addition to Aleppo pine, the production was always supported by black pine, oak, and fir, forest species where the destruction in 2021 was relatively limited. Given the changes in land use since the last inventory and the mega-fire of the summer of 2021, these figures are given with reservations but can describe the situation regarding the extent of forest ecosystems and their importance in the forest sector before and after the disaster.

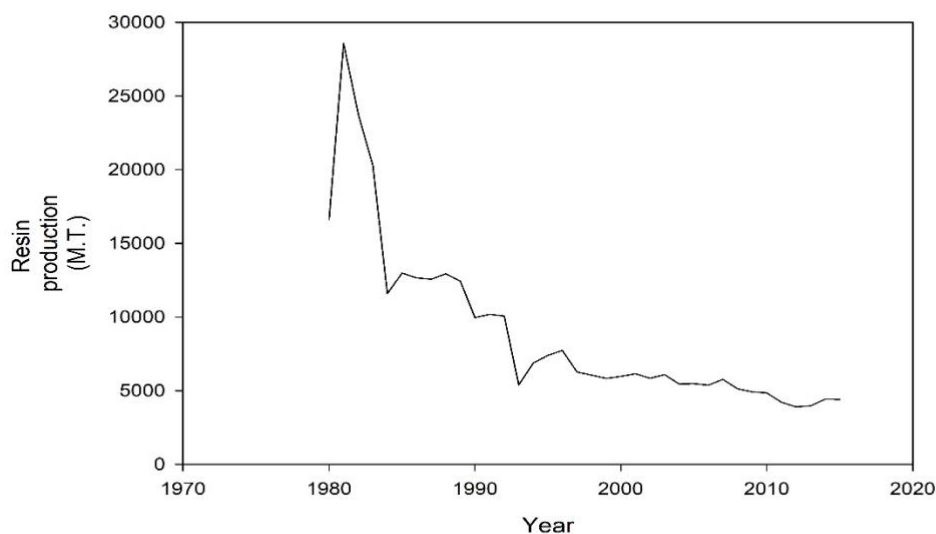
Of the total burned area of 37.939 ha of forest that burned during the summer of 2021, 23.289 ha of burned forest area were located within the Municipality of Limni-Mantoudi-Agia Anna (61.39%) and 14.650 ha were located in the Municipality of Istiaia-Edipsos (38.61%). However, the percentage of burned forest area varied a lot between the local communities. In the Municipality of Istiaia-Edipsos in

the communities of Istiaia and Kamaria, less than 1% of the total forest area burned, while at the other extreme in the communities of Kokkinomilea and Agdines 100% of the forest burned. Similarly, in the Municipality of Limni-Mantoudi-Agia Anna, whereas 6.1% of the forest burned in the community of Dafnoussa and 13.9% at Metochi Kireos, the communities of Amelantes, Kerameia, Kerasia and Kourkouloi, lost 100% of their forest [13]. The forest that has been spared from this disaster, and where forest production is possible, must be considered as a precious source of economic recovery, important for the entire northern part of the island, at least until the regeneration of the new forest. However, as in several local communities, the percentage of their forest area that has been burned exceeds 80% and reaches up to 100%, cooperation between all the communities in terms of employment, common interest, establishment of economic relations, and working together to restore the local economy is key to future development.

## 2.2. Resin Production

Northern Evia's economy was largely based on small-scale farming of animals, honey, olives, and resin from the Aleppo pines. Resin production brought 5.5 million euros each year to north and central Evia and was a traditional branch of the economy. The 'resin collectors' are a professional group with less than 2.000 members across the country, most of them doing business in Evia and more specifically, in Northern Evia.

Competition with other countries that produce chemical resin (mainly China) as well as modern social and economic conditions have decimated the industry and reduced production (Figure 2).



**Figure 2:** Resin production in Greece during the last decades, Source: [14]

## 3. Forest Policy and Fires

The magnitude of forest fires in 2021 must trigger important changes in national forest policy, with emergency implementation in Evia. These changes must have a clear and definitive future orientation. Pushed in different directions by different interest groups and by different visions of the role of forests in Northern Evia development, policymakers must move forward after evaluation of the proposed measures. This evaluation can provide a stable strategy: more detailed, tested, and more effective. The first feedback concerning important and urgent actions mainly for soil protection (Figure 3) and



harvesting of the burned timber, took place quickly and in a logical framework, in terms of time and bureaucracy.



**Figure 3:** Soil protection and flood prevention structures in Limni. (Source: author's personal archive)

Bivolarski [15] reported that the usual economic consequences of the wildfires include loss of wood, reduction of land productivity, deterioration of growing conditions, considerable decrease in financial income of the local population, other social consequences, negative impact on the micro-climate and economic conditions, decrease in the tourist business, limited work opportunities and impoverishment of people, migration of people from the burned regions, and other additional investment for curbing harmful consequences. Martinho [16] reported that the creation of a common forest policy interconnected with a common agricultural policy, incorporating innovation and entrepreneurship strategies, could be an interesting approach. Considering the dimensions of the consequences of forest fires, the related policies must reconsider the relevance given to the socio-economic impact on the agroforestry sector in total. At the national level, it is reported that Greek government agencies in charge of post-fire rehabilitation seem to have difficulties in incorporating diverging information on the area burned and the consequences of fire location and severity, such that a low consequence event with a high burned area is given equal consideration in post-fire governance as a smaller fire with high levels of impact [17]. If land management agencies could reliably assess what really happened during fire propagation, and predict short-term post-fire conditions, they could rank and prioritize post-wildfire mitigation investments. Governmental programs for fire management must include components for fire prevention, detection, fuels management, suppression, and post-fire site rehabilitation. Holmes et al. [18] reported that the dependency of wildfires on available fuels provides the rationale for management strategies such as prescribed fire and mechanical fuel reduction, which are applied to reduce wildfire spread and intensity. Funding wildfire suppression with huge emergency funds provides little incentive for cost containment. The attention to prevention is underlined by the literature. Tedim et al. [19] concluded that the inability of firefighting mechanisms to control large fires usually leads to efforts

aimed at increasing these threshold levels, through better organization, faster response, more resources, and adoption of technological advances, alas at an ever-increasing suppression cost.

#### 4. Suggested Targets and Representative Actions

The main forestry target, at the national level, is to improve the quality of life of the urban population and preserve the environment through the sustainable exploitation of forest resources, with an ambitious projected contribution of 1% to the national GDP (National Forest Strategy, 2018–2038), taking advantage of all the strengths and opportunities of the forest area. A development-oriented SWOT model must be adapted and implemented (Figure 4). Overcoming significant constraints, the Greek forest sector must be developed in all sub-sectors. The production of forest products (wood and non-wood) but also services must be improved. The suggested targets and representative actions are presented in Table 1[20]. Targets like the strengthening of forest exploitation (and not only their protection), the active participation of the local population, the focus on small and medium-sized forestry, and the promotion of the natural benefits of forest resources in some areas such as Northern Evia, are presented.

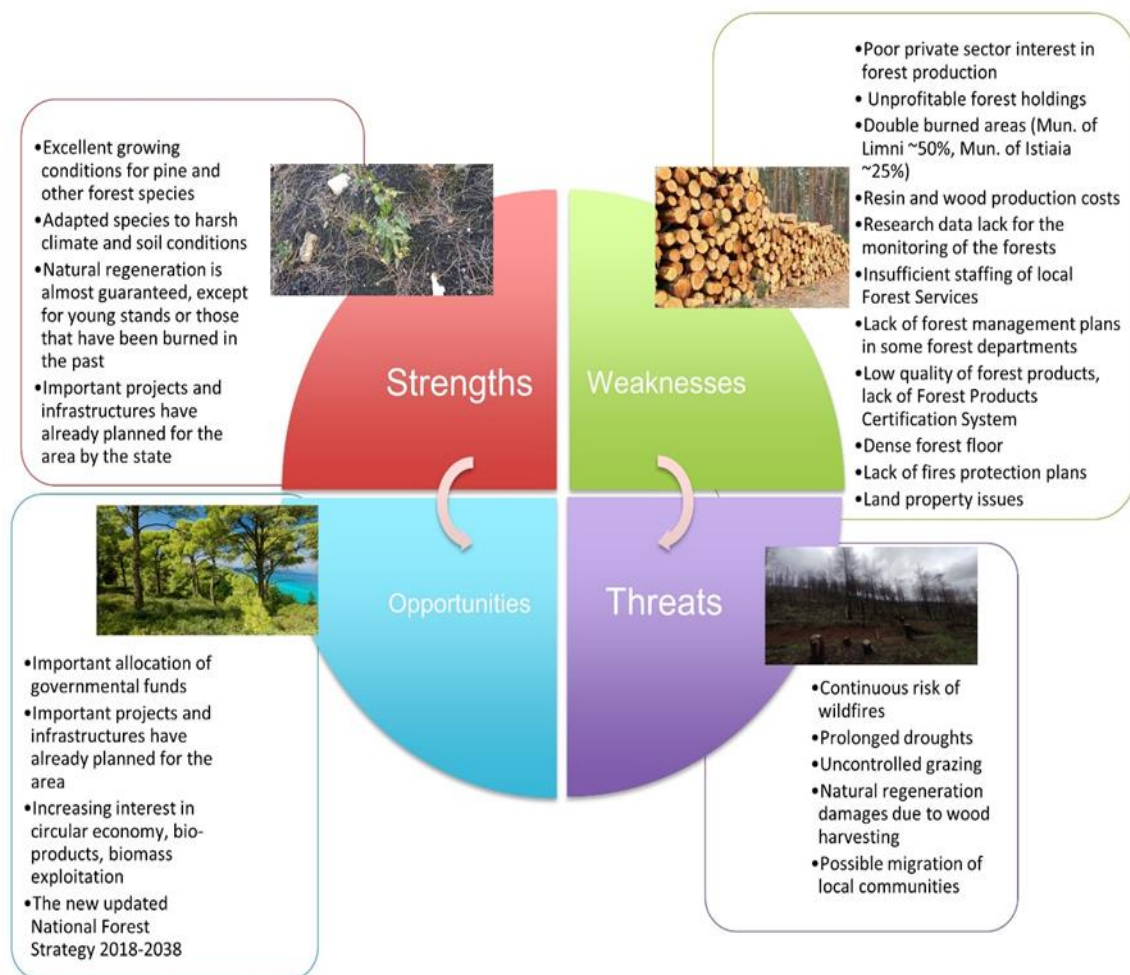


Figure 4: A development-oriented SWOT model

**Table 1**

The revised forest policy in Evia, aiming at economic development\*.

Scope	Representative actions
From traditional protection to higher exploitation	<ul style="list-style-type: none"> <li>- Limit the storage of forest natural capital</li> <li>- Pay more attention to alternative opportunities for exploitation</li> <li>- Increase logging activities based on SFM</li> <li>- Adopting or creating a national certification scheme</li> <li>- Fund industrial plantations where is possible</li> <li>- Ensure stable prices and quantities of raw material from the national forest resources for long term periods based on management plans</li> <li>- Focusing on prevention of illegal logging</li> </ul>
Valorization of the forest resources in the area of northern Evia.	<ul style="list-style-type: none"> <li>- Collection of specific data regarding timber and non-timber products value and other ecosystem services.</li> <li>- Production of Forest Inventory with priority, to provide a survey of the location, composition, and distribution of the forest resource and their relative amounts over a given area.</li> </ul>
Enhance the role of the local population in the marketing of forests products and services	<ul style="list-style-type: none"> <li>- Awareness of local populations</li> <li>- Promote the new opportunities for investments</li> <li>- Motivation</li> <li>- Regional forest programs</li> <li>- Subsidies increase</li> </ul>
The potential for income and employment in rural areas from recreation activities should increase	<ul style="list-style-type: none"> <li>- More attention to alternative tourism</li> <li>- Awareness of local populations</li> <li>- Motivation</li> </ul>
Potential for high benefits from NWFP and services	<ul style="list-style-type: none"> <li>- Investments</li> <li>- Mushrooms, chestnut, honey, resin, and truffles are among the most important NWFPs in the Mediterranean region [21]. Regional forest programs for the industrial production of turpentine and rosin and the exploitation of wild forest fruits and nuts (mainly from chestnut, but also from oak), aromatic and medicinal plants, leaf soil, etc.</li> <li>- Subsidies increase</li> </ul>
Development of export markets	<ul style="list-style-type: none"> <li>- Investments in innovative technology and education</li> <li>- Investments in infrastructures (to reduce transportation costs, develop communications, etc.)</li> <li>- Labor continuing training</li> <li>- Follow EU specifications for forest products</li> <li>- More competitive forest products (i.e. bio-based products)</li> </ul>
Creation of employment from small and medium scale forestry business	<ul style="list-style-type: none"> <li>- Attract new investors</li> </ul>
Promotion of the advantages of a region in the production of a particular product (resin etc.).	<ul style="list-style-type: none"> <li>- Investments in specific sub-sectors mean different technology and market behavior</li> </ul>
Well informed investors, industry owners, policy and decision-maker	<ul style="list-style-type: none"> <li>- Adoption of good practices from abroad</li> </ul>

\*Adapted from Koulelis (2019)

## 5. Conclusions

There is very little information available about the socioeconomic impact that natural disasters have on our communities as a whole. However, there is a previous experience in the prefecture of Ilia, in Peloponnese, in 2007 where nearly 2/3 of the area burned. Without a serious and well-coordinated rehabilitation and reconstruction effort, the local communities did not recover completely and the area suffered loss of income and ultimately of population [22]. The questions about what went wrong and what policies could prevent disturbances like large fires in forest ecosystems continuously arise. In all the questions, maybe one possible answer could be the implementation of sustainable forest management (SFM). SFM with all its structural elements included establishes the forest production, ensures the avoidance of the creation of mega-fires, and finally, contributes to the substitution for fossil-based raw materials and carbon storage. The suggested targets and actions of this study emerged from SFM and are connected with the reconsideration of forest policy, firstly at local level and then, nationally. These targets could lead to socio-economic development, beneficiary for the forest and also for society.

## 6. Acknowledgements

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