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EUROPEAN UNION'S FOREST FIRE POLICIES IMPLEMENTATION IN THE POST-PANDEMIC AGE

Daniel Jeremia Natanael Nababan[1], Henny Saptatia Drajati Nugrahani[2*]

[1]School of Strategic and Global Studies; University of Indonesia; Indonesia
[2]School of European Studies; University of Indonesia; Indonesia
*email: henny.saptatia@ui.ac.id

Abstrak

Penelitian ini bertujuan untuk mengevaluasi kebijakan pengendalian kebakaran hutan Uni Eropa (UE) dan mengeksplorasi implementasinya dalam memperkuat ketahanan negara-negara Eropa Selatan di era pasca-pandemi. Subjek penelitiannya adalah Portugal, Spanyol, dan Italia. Penelitian ini menggunakan teori Multi-Level Governance (MLG) dari Hooghe dan Marks, serta teori Social-Ecological Systems (SES) dari Folke dan Berkes. Analisis mengambil rentang waktu 2021–2023, dimulai sejak European Commission mengeluarkan the New EU Forest Strategy for 2030 hingga tahun dilakukannya studi ini. Temuan dan analisis studi menunjukkan bahwa di era pasca-pandemi Covid-19, telah terjadi perkembangan penerapan MLG untuk memerangi kebakaran hutan di tiga negara Eropa Selatan tersebut. Selain itu, the New EU Forest Strategy for 2030 juga menujukkan korelasi dengan faktor dan sub-sistem yang ada dalam kerangka SES dan telah diterapkan oleh negara-negara tersebut. Namun, temuan penelitian menunjukkan bahwa kemajuan EU dan tiga negara Eropa Selatan dalam menangani kebakaran hutan masih belum memadai.

***Kata Kunci**: Kebijakan dan Strategi Kehutanan EU; kebakaran hutan; Multi-Level Governance; pasca-pandemi; Eropa Selatan*

Abstract

This research aims to evaluate the European Union's forest fire control policies and explore their implementation in strengthening the resilience of southern European countries in the post-pandemic age. The research subjects are Portugal, Spain, and Italy. This research utilizes Hooghe and Marks' Multi-Level Governance theory (MLG) along with Folke and Berkes' social-ecological system theory (SES). The study focuses on the period between 2021 and 2023, starting with the release of the EU's new Forest Strategy for 2030. While the findings indicate the development of MLG frameworks within southern European countries and alignment between the New EU Forest Strategy for 2030 and the SES principles, progress in combating forest fires remains insufficient. The research identifies key areas where EU policies and national implementation can be strengthened to enhance preparedness, response, and recovery efforts, as well as participation and decentralization.

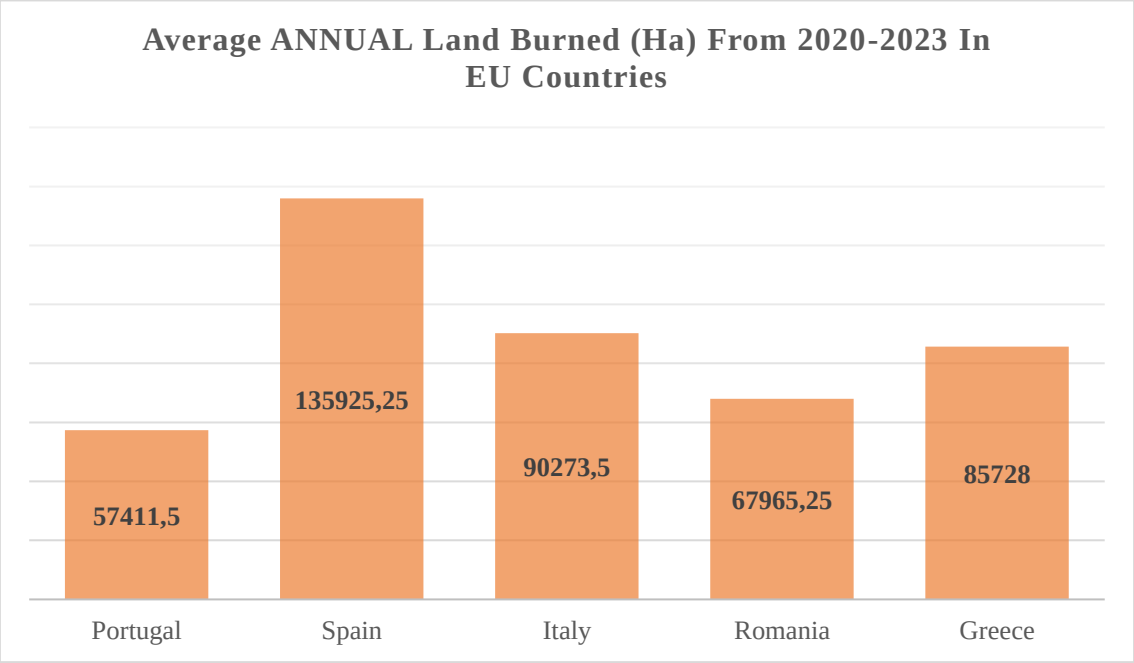
Keywords: EU's Forest Policy and Strategy; fores fire; Multi-Level Governance; post-pandemic age; Southern Europe

Introduction

Resilience is the capacity to withstand suffering, with sustainability components including economic, social, and environmental (Bolson et al., 2022). Every country's resilience is linked to its ability to manage the environment, including handling natural or man-made disasters. Forests are addressed in a country's resilience since they are an important component in fulfilling the country's food and socioeconomic needs. In Europe, around 33% of the total land area is covered by forests (Pucher et al., 2022). Europe needs to pay close attention to forestry conditions from a policy to a practical level.

According to EFFIS (European Forest Fire Information System) in 2022, a record more than 700.000 hectares of forest were burned in the European Union (EU) region. The highest number since 2006. The figure below displays average annual burned land data from 2020 to 2023 for several of the EU's most affected countries.

Figure 1 – Annual Average Land Burned (HA) from 2020–2023 in Several EU Countries



Source: EFFIS. Chart by Author, 2024

Despite some studies showing the Covid-19 pandemic had a positive impact on the environment including air and water quality, also ecosystem recovery(Ashraf et al., 2022), in the forestry sector, the average number of burned areas across Europe is still

relatively high until 2023. Data from EFFIS shows that countries in southern Europe remain at the top of the list.

Over past decades, southern European countries, particularly Portugal, Spain, and Italy, have identified forest fires as a primary concern. In 2017, Portugal was devastated by a horrific disaster known as the Pedrógão Grande Wildfire. The catastrophe destroyed around 45.000 hectares of land and led to the deaths of 66 people. This year alone, 539.920 hectares of land were burned, and caused a loss of around 1 billion euros (San-Miguel-Ayanz et al., 2017). While Spain, particularly the northern region, has become a forest fire hotspot in 2022. In 2022, an estimated 305.000 hectares of land would have burned in Spain (EFFIS, 2023). As for Italy, there has been an increased amount of forest fires and land burned between 2016 and 2020 (San-Miguel-Ayanz et al., 2020).

There are limitations and gaps in previous research on this subject. Most studies have focused on exploring the increase in the number of forest fires and various forest fire management models in European countries (San-Miguel-Ayanz et al., 2020; de Diego et al., 2023; Fernandez-Anez et al., 2021; Malandra et al., 2022). Numerous studies have been done in Southern European countries addressing the causes, impacts, and motivations of forest fires (Elia et al., 2022; Meier et al., 2023; Tedim, et al., 2022). Moreover, the European Union's approach to environmental issues at the national and community levels (multi-level scale) in the pandemic period has been studied (Varumo et al., 2020). Nevertheless, no studies have directly examined the goals and implementation of the European Union’s policies through a Multi-Level Governance framework in dealing with forest fires and their effectiveness. Only a small amount of research is being executed to investigate developments in forest fire policies in post-pandemic southern Europe. In addition, there is a theoretical gap since no study has used a Social-Ecological Systems framework to formulate the New EU Forest Strategy for 2030. As a result, the following contributions are included in this study: (1) to identify the European Union policies and strategies implemented through a Multi-Level Governance framework to control forest fires and strengthen southern European countries’ resilience in the post-pandemic age (2) to formulate a correlation between the EU Forest Strategy for 2030 policy and SES values, as well as its implementation in the three southern European countries.

Methodology

Multi-Level Governance Theory

According to Hooghe & Marks (2001), Multi-Level Governance (MLG) is a system of continuous negotiations between governments at the territorial level (supranational, national, and regional), the developments of which have been applied more broadly in other fields and policies regimes with the involvement of non-governmental actors. This study utilizes MLG theory to investigate the role of MLG in dealing with forest fires in southern European countries at the local, national, regional, and global levels. MLG emphasizes the reallocation of a specific authority by the centralized state, to transfer political power to each government level, such as neighborhood, municipality, province, region, nation-state, and international organization (Uysal & Aldemir, 2019).

Social-Ecological Systems Theory

To assess the EU's forestry policy and its implementation in southern European countries, this study also highlighted points or values included in the Social-Ecological System (SES) theory. SES defines sustainable management as a combination of social and ecological factors. SES aims to understand the nature of humans and natural systems that are interconnected in new, interconnected, and interdependent ways (Biggs et al., 2022). According to Folke (2006), resilience, cohesion, strong connections, and feedback, as well as adaptive governance, are required for ecosystem growth.

The theoretical framework applied to examine the adaptation, emerging innovations, vulnerabilities, and sustainability of existing forest management systems in the three southern European countries. Several factors in SES (Folke et al., 2016) need to be highlighted: (1) Develop an understanding of resource and ecosystem dynamics; recognizing and responding to environmental feedback in a way that adds to resilience necessitates ecological knowledge and comprehension of ecosystem processes and functions. (2) Integrate ecological information into adaptive management approaches; effective management is defined by constant examination, monitoring, and reevaluation to improve adaptive responses while recognizing the inherent uncertainty in complex systems. (3) Support flexible institutions and multilevel governance systems; the adaptive

governance framework is operationalized through adaptive co-management, which combines adaptive management's dynamic learning characteristic with co-management's multilevel connection characteristic. (4) How the system handles disruptions from outside, uncertainty, and surprise. In this study, it is associated with the pandemic Covid-19 outbreak.

SES also includes variables as fundamental subsystems (Trimmer et al., 2020): 1) the resource system, which includes the area and ecological zone; 2) the resource units; 3) performers; 4) the governance system, the rules that actors must follow (including regulations and monitoring regimes); 5) focal action circumstances, which reflect interactions, decisions, and results that generate feedback. The broader social-ecological context is represented by two additional subsystems: 6) related social, economic, and political contexts; and 7) related ecosystems.

Research Design

This study uses a qualitative research method with an exploratory approach. The exploratory approach is intended to investigate, develop, or explore new ideas on a certain subject to better understand an issue in full depth. In addition, the research uses an interdisciplinary strategy in which scientific disciplines interact to develop and provide new outputs in zanalyzing forest fire issues.

Data Collection

The material of this study focuses on the EU and the three southern European countries (Portugal, Spain, and Italy) forest fire policy, report, and strategies using the following search terms on the internet: “Multi-Level Governance, forest fire, European Union, environment” and “Multi-Level Governance, (southern European countries name), forest fire, resilience, Covid-19”. The documents that were utilized in this study are intergovernmental organization publications, governments publications, EFFIS data, and research related to forest fire, focused on the post-pandemic age with a range from 2021–2023.

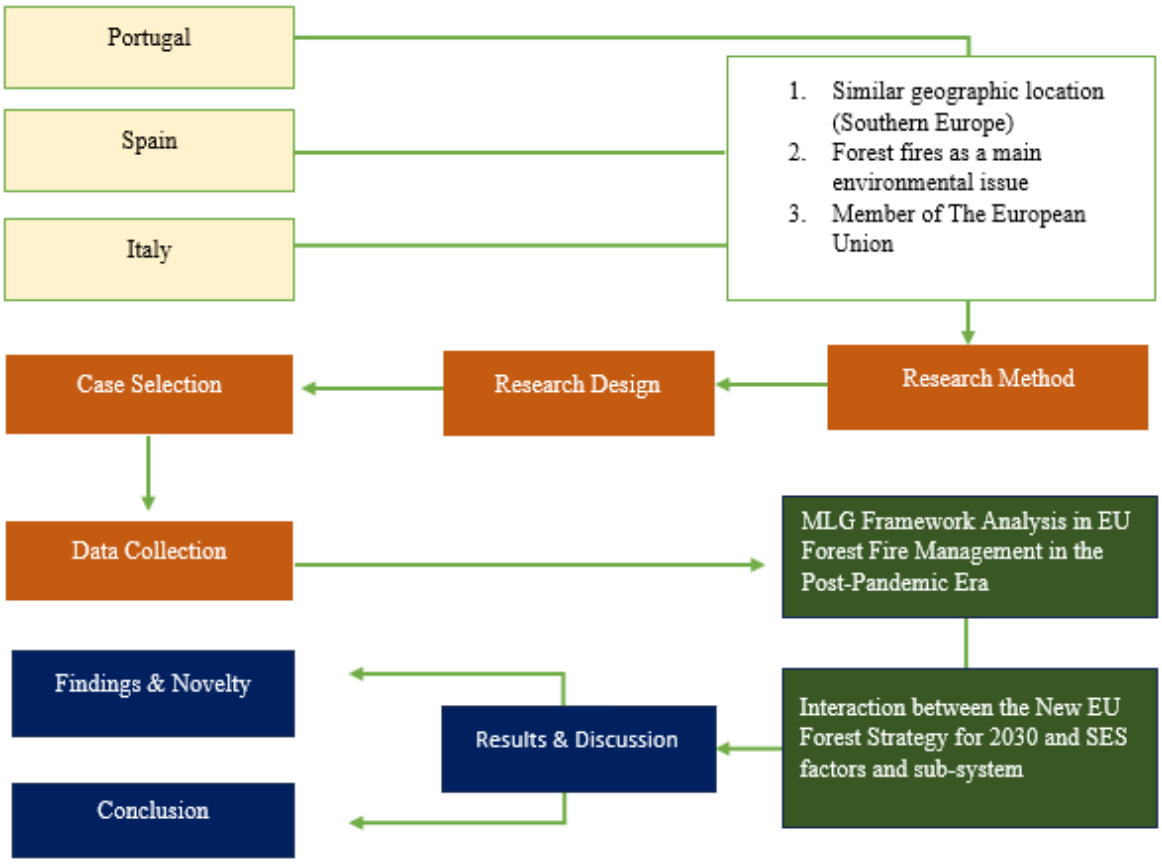
This study also utilizes scoping reviews. Scoping reviews are used to map the concepts underlying the study field as well as the primary sources and types of evidence that are accessible (Arksey & O’Malley, 2005). The scoping review is used if the

literature collection has not been properly evaluated, or if it is too huge, complex, or heterogeneous to support a more specific systematic evaluation.

Data Analysis

The research is conducted through four phases: (1) research design, (2) case selection, (3) data collection, and (4) data analyses. The research design creates a preliminary framework, including the type of approach and method. It uses a qualitative method and an explorative approach. In the case of selection, the research subjects were selected based on their similar geographical location (southern European sub-region), main concern in the forest fires issue, and membership in the EU. The data collection period is 2021–2023 to see how EU forestry policies and practices have developed and changed in the three countries since the Covid-19 pandemic began.

Figure 2 – Research Framework



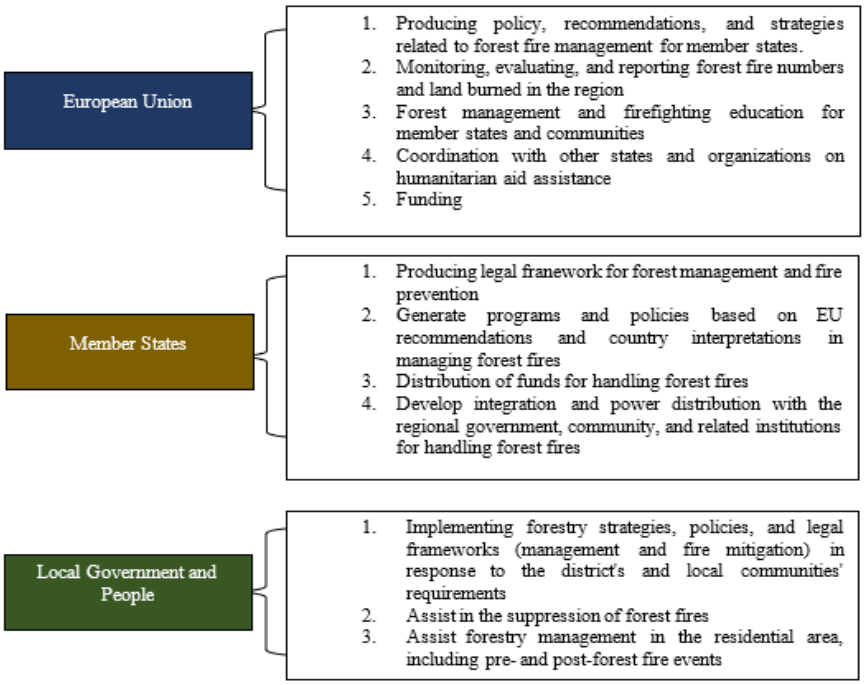
Source: Created by Author, 2024

Results And Discussion

Multi-Level Governance: Framework and Strategies of the EU to Prevent Forest Fires

The European Union can execute policy directives through a Multi-Level Governance system, comprising supranational institutions linked to national, regional, and municipal authorities. Multi-Level Governance draws attention to governance's complexity and provides an overview that allows for the identification of the number of policy actors and clarification of processes, discourses, and systems that may be less visible (Hooghe et al., 2003). Competencies are transmitted and contested between actors in MLG (Tamtik & Colorado, 2022). Similarly, there is regional complexity or fields that are addressed across actors in the EU and member countries' handling of forest fires in the post-pandemic age. The MLG framework allows for the identification of roles, objectives, and decentralization processes that occur in the post-covid age at the global, regional, national, and local levels.

Figure 3 – EU MLG framework for handling forest fires



Source: Created by Author, 2024

European Union Global Forest Fire Cooperation

The European Union's forestry policies and relationships in forest governance and forest fire mitigation are strengthened by open collaboration with other countries and international organizations. Several outcomes that have had an impact in the post-pandemic era involve the following: collaboration with funding, research, and monitoring institutions to address forestry issues and forest fire mitigation, alignment of strategic goals with the global forestry agenda and UN SDGS 2030, and strengthening cooperation in forest products of member countries (such as wood-based products, etc.) with non-EU countries.

On a global scale, research and financing are EU-specific outcomes. Throughout the pandemic, the European Union has worked extensively with non-EU organizations and nations to enhance forest governance and forest fire mitigation. In 2023, the Commission's Joint Research Center returned to provide maps to identify burned areas in Europe, the Middle East, and North Africa. The EU also collaborates with nine non-EU countries in the Emergency Response Coordination, which helps countries that require it. Firefighting helicopters, food, and medications were among the services supplied.

In terms of forest fire monitoring applications, the Copernicus Emergency Management Service (EMS) and EFFIS (European Forest Fire Integrated System) play an essential role in anticipating natural disasters, particularly EFFIS, which is dedicated to worldwide forest fire monitoring. These tools help countries throughout the world predict forest fires, including burned areas, human settlements, the number of annual forest fires in each country, and other constantly generated resources. Copernicus created 322 maps of places affected by forest fires around the world in 2022.

Based on the identification at the global level, the EU and non-EU countries, as well as multilateral organizations, play an active role in developing policies, coordination, and technological advancements for forest fire management. As a result, during the pandemic era, the use of Emergency Response Coordination and EFFIS was effective in enhancing information and integrating assistance systems for countries affected by forest fires. The integration of countries and the involvement of multilateral organizations have an impact on the global response to forest fires, particularly their role in disaster mitigation.

However, member states should be more involved in providing information regarding EU forest fire coordination and partnership. EU outcomes and how the organization operates on forest fires should be informed down to the local level. As EU member states become more involved in global forest fire coordination and natural disaster response programs, their management authority should be enhanced.

Regional Level

As a supranational organization in the region, the EU shares competencies with member countries and supports competencies regarding the management of forest fires that occur in the territories of member states. EU and its institutions initiate cooperation with member countries in the form of programs, assistance schemes, policy recommendations, and various cooperative measures to deal with forest fires in the European region, including developing countries and on other continents. The environmental issues in each EU sub-region are influenced by geographical factors, climate, human activities, as well as socio-political conditions. Meanwhile, the Southern European sub-region is one of the EU's top priorities when it comes to dealing with forest fires.

EU plays a role in forest fire management by developing plans, evaluations, and supporting materials that analyze and serve as general recommendations in the application of forest fire control techniques on the territory of member states. Meanwhile, in terms of legislation, sanctions, and immediate procedures on member state's territory, the governments of each country have greater capacity to execute and create innovation. Similarly, the local community, as actors with direct involvement, requires more qualified opportunities.

EU takes comprehensive steps in dealing with environmental problems and forest fire management through several strategies and policies in the post-pandemic age, including the EU Strategy on Adaptation to Climate Change, the European Green Deal, the EU Forest Strategy for 2030, the draft Nature Restoration Law recently presented by the European Commission, and The New EU Forest Strategy for 2030. The EU also developed various education and forest fire prevention programs. EU's recommendations for strategy and coordination on forest fire prevention in the southern European sub-region were developed particularly for Portugal, Spain, and Italy.

National Level: Forest Management and Policies in Southern European Countries

Findings show forest fires must be given more attention at the national level. Each EU member state implements forest fire prevention guidelines, strategies, and policies. They aim to design and adopt a forest fire strategy and involve the local community. During the pandemic, Portugal, Spain, and Italy developed various forest fire policies and plans, some of which were also codified into law by the government. However, the result is not optimized.

Portugal

During the pandemic period, the number of forest fires in Portugal remained relatively high. According to EFFIS (2023), the average annual number of forest fires in Portugal between 2020 and 2023 is 197. Around 0.70% of Portugal's land area is burned annually (EFFIS, 2023). It means that from 2020 to 2023 Portugal has lost an average of 57 thousand hectares per year due to forest fires. Criminal acts such as forest burning and a lack of forest sanitation are impactful in increasing and expanding the area of forest fires (Ribeiro et al., 2015). The socioeconomic impact of forest fires in Portugal is equally significant.

Portugal has been able to bring the Multi-Level Governance system down to the local level when it comes to forest fire management. Each district and municipality in Portugal have its forest fire protection commission for forest fire protection, and most municipal councils have a Forestry Technical Office in their structure, which is responsible for developing a municipal plan for forest fire protection and supporting forest owners' interventions (Ribeiro et al., 2015).

One of the policies issued by the Portuguese government during the pandemic era was Decree-Law No. 82/2021, which aims to integrate system management for forest fires in rural areas with a program called the Integrated Management System for Rural Fires in mainland Portugal (SGIFR). This decree includes several structures, standards, and processes connected to the pre-event and post-event planning, management, and disaster mitigation systems. It also gives public and private institutions the authority to interfere in rural and urban areas. However, the system established in Portugal's policy through the SGIF is currently facing difficulties. There is a lack of accuracy in the system,

and the creation of forest fire management models takes a long time, which can lead to the expansion of forest fire areas as well as economic, environmental, and social difficulties in emerging countries (Tedim, et al., 2022).

When it comes to dealing with forest fires, Portugal has a lot of stakeholders. As a result of their engagement, Portugal has been able to generate networking, identification, evaluation, and forest fire support from a variety of perspectives and sources. AGIF (Agency for Integrated Management of Rural Fires), ANEPC (National Emergency and Civil Protection Authority), Independent Technical Fire Observatory, Municipal Forest Engineer, and ForestWISE CoLAB are a few examples.

The establishment of forest fire management agencies at the local level in Portugal is included in the Council of Ministers' 2020 National Plan for Integrated Wildland Fire Management (PNGIFR, *Plano Nacional de Gesto Integrada de Fogos Rurais*). The PNGIFR introduces an innovative risk governance model and specifies strategic goals and measures to be executed, as well as the roles and duties of each entity working together to achieve the established targets.

The progress made in the post-pandemic age indicates that Portugal is still unable to establish adaptive and resilient forest fire management. Portugal is struggling to create adaptive forest fire management due to numerous targets, insufficient sustainability plans, integration among stakeholders (Rocha, 2021), and the functionality of roles among stakeholders involved in forest fires. To achieve adaptive, sustainable, and resilient environmental management, additional organizations must be created with significant roles. The goal is not just to expand the organization but also to generate enough effects to enable adaptive, sustainable, and resilient environmental management.

In practice, firefighting organizations' efforts in Portugal have significantly impacted local forest management, but there is a lack of clear direction on delegation of state authority to the community or integration of government-designed methods. This has led to insufficient efforts, especially in post-fire events. Transitioning to a bottom-up model is needed to improve forest handling mechanisms. NGOs and government institutions involved in Portugal must be able to disseminate knowledge about forest fire management and prevention, as well as understand more about the patterns of fire handling that occur in each region. The operating system can evolve through the

integration of scientific and practical information. This effort is also impactful in strengthening national resilience.

Spain

Spain is the most vulnerable compared to the other two countries. Moreover, as an EU member country with the highest number of forest fires in 2023 and an increase in the amount of land burned at a critical level, this condition is also caused by a lack of forest fire policies in the era of the Covid-19 pandemic. In 2023, at least 315 forest fires were reported in Spain (EFFIS, 2023). This number is higher compared to the rest of the EU. Between 2020 and 2023, approximately 136 thousand hectares of land are burned in Spain yearly (EFFIS, 2023). Spain is one of the three most affected countries in terms of land burned, and it is also the first EU country to have lost protected forests (European Commission, 2021).

Fulfilling community needs and identifying behaviors are vital for promoting community welfare and overcoming the harmful effects of forest fires. A study on the socio-economic impacts on society after the forest fires in Spain (de Diego et al., 2023) explains that different methods of handling and prevention are needed to come up with appropriate solutions in the context of forest fires. In addition, information assistance is needed to design strategic forest fire risk mitigation measures, such as population identification such as age, traditional management practices that take place in the forest environment, unemployment rates, and economic inequality that exists in the region. Spain is still struggling with forest fire observation, as several locations are still unable to gather relevant data. In Spain, MLG for forest fires is still less developed than in the other two countries, particularly in the era of the Covid-19 pandemic.

Spain's strategic and policy framework, particularly measures to combat forest fires during the pandemic, tended to be reactive and reconstruction focused. To adapt the country's resilience in the era of the Covid-19 pandemic, the Spanish government issued several policies that had an impact on handling forest fires, which included the Plan for Recovery, Transformation, and Resilience, residential rehabilitation, and social housing. This program seeks to improve the economic sector that has been harmed by the pandemic. The approach is to provide community subsidies while also creating jobs. The

Spanish government also gave the regional government 1.9 million euros for residential rehabilitation and social housing.

Findings show several policies and programs being implemented by the Spanish government do not focus on the state forestry sector, particularly the problem of forest fires. In comparison to the other two countries, Spain produced very few programs related to forest fires during the pandemic era. The policy that resulted combined the Covid-19 issue with forest fires. As a result, there has been a lack of focus on forest fire management in Spain. This caused forest management aspects to be unfulfilled. However, Spain's fire management development demonstrates that an effort is being made to address the problem of forest fires through MLG. The government's progress encourages regional governments to regulate patterns of handling forest fires in their respective regions.

Italy

During the pandemic period, from 2020 to 2022, Italy had the highest number of forest fires in the EU region. According to EFFIS estimates, at least 546 forest fires occur in Italy per year throughout this period (EFFIS, 2023) This number is expected to fall in the first and second quarters of 2023. From 2020 to 2023, 90 thousand hectares of land were burned in Italy per year.

According to the National Framework Law 353/2000, the competence for forest fire management in Italy falls on the regional level. The regional AIB division (Antincendi Boschivi is an agency focused solely on forest fire management activities, such as fire forecasting, prevention, and suppression), local landowners, communes, municipalities, and volunteers all collaborate with the Civil Protection, the Vigili del Fuoco (fire services), the Carabinieri Forestali (investigation after fire events), the Prefectures, and the National Civil Protection Department. In Italy, there are various organizations, both community and government, created to handle forest fires. The forest fire regime progresses towards more decentralization. Every instrument in society is involved in fire management. The mechanism is also supported by government plans and policies.

Findings show the Italian government produced several policies related to forest fires in the Covid-19 pandemic period. The government issued a ban on cutting trees without a permit from the Superintendent Office of Landscaping, the State of Emergency

on Forest Fire 2021, and aid workers and supplies for community needs from the National Fire and Rescue Corps in collaboration with the Regional Civil Protection Agency. Italy is betting on hi-tech fire detection sensors to protect its forests from climate change. As Europe battles wildfires, Italy is deploying sensors on trees that can detect blazes and alert authorities. When compared to the other two countries, Italy's most notable progress in the era of the Covid-19 pandemic has been the use of forest fire detection technology. However, for this technology to be effective, it should be accompanied by public education and become a driving factor for multilevel governance.

Progress in the post-pandemic period shows that despite moving towards a more decentralized forestry management and fire regime, Italy still has various obstacles that need to be solved. Italy requires identification and consistent data collection on a national and sub-national scale, which is important in understanding trends in forest fires, identifying causes, and implementing the proper strategy (Malandra et al., 2022). Raising awareness among policymakers, land managers, and scientists has direct ecological and socio-ecological consequences. Historical fire statistics in Italy suggest that wildfires have a positive relationship with the human sphere since negligence and arson represent the major causes of wildfires (Elia et al., 2022). Italy's forest fire prevention model and policies are insufficient to manage pre- and post-forest fires. Lack of risk mapping, fewer sanctions related to illegal forestry practices, and problematic agricultural management practices are causing more problems in the Italian forestry sector.

Encouraging Resilience of Forest in Europe through the New EU Forest Strategy for 2030

The following analysis below demonstrates the interaction between the main points of the New EU Forest Strategy for 2030 and SES factors and sub-systems.

Table 1 – Interactions between the New EU Forest Strategy for 2030 and SES factors and sub-system

Key Points in the New EU Forest Strategy for 2030	Social-Ecological System factors and sub-system
	1. Actors or performers (society and national government)

Supporting the socio-economic functions of forests for thriving rural areas and boosting forest-based bio-economy within sustainability boundaries.	2. Funding, related social and economic context, insufficient political aspects at this point
	3. Related ecosystems
Protecting, restoring, and enlarging EU's forests to combat climate change, reverse biodiversity loss, and ensure resilient and multifunctional forest ecosystems.	4. Mapping the area and ecological zone
	5. Governance system, the rules that actors must follow (including regulations and monitoring regimes)
Strategic forest monitoring, reporting, and data collection.	6. Focal action circumstances, which reflect interactions and decisions
	7. Feedback mechanism
A strong research and innovation agenda to improve our knowledge of forests.	8. Innovation and adaptability
	9. Resources unit and knowledge
Inclusive and coherent EU forest governance framework.	10. Adjusting MLG framework and encouraging participants from the local level to join the policy process
Stepping up implementation and enforcement of existing EU acquis.	11. Integrating forest strategy with EU law and framework

Source: Created by Author, 2024

The New EU Forest Strategy for 2030 contains various recommendations and frameworks that make connections between ecological and social aspects. The analysis shows that the EU seeks to improve the condition of forestry in European member countries by promoting adaptation and resilience within this strategy. The objective of the New EU Forest Strategy for 2030 is to "set a vision and concrete actions to improve the quantity and quality of EU forests and strengthen their protection, restoration and resilience" (Lier et al., 2022). The strategy places forest demands in the context of changing environmental conditions due to climate change and meeting socio-economic needs. This strategy additionally considers how the EU and member countries collaborate on funding.

The New EU Forest Strategy for 2030 provides a step forward in integrating other EU forestry policies with member states. The Commission is developing guidelines on closer-to-nature forestry (European Commission, 2021), which will feed into work on

indicators and new thresholds for sustainable forest management, and these will be undertaken in close partnership and cooperation with Member States through the updated EU forest governance framework. Meanwhile, the strategy also limits additional structure involvement.

Ensuring communities as actors in this EU plan additionally requires management training. The EU also emphasized how workers in the forestry sector are establishing an ecosystem for payment or wages for environmental services. In Portugal, Spain, and Italy, community involvement in training and education related to the forestry economic sector continues to develop. However, the governments have shown less attention to these countries' expanding prosperity in the forestry sector. Apart from not having a major effect on the country's GDP (Perez & Molina, 2003; Nunes et al., 2019), these three countries' attention to forestry workers has also become a perennial problem. The strategy also fails to define what the EU considers to be suitable wage standards in the forestry sector.

This strategy also summarizes the initiatives proposed by the EU to strengthen forest resilience and disaster mitigation, including forest fire management. Among the suggested steps are: (1) The establishment of protected habitat patches to ensure the long-term environmental and socio-economic viability of forests. (2) Management practices like uneven-aged and continuous-cover forestry and the establishment of protected habitat patches or set aside areas in production forests help ensure long-term environmental and socio-economic viability of forests. (3) Forest-related risk management practices including 'insurance policy' and safeguard. (4) cooperation with different forest stakeholders (including EU and member states), to identify additional indicators as well as thresholds or ranges for sustainable forest management concerning forest ecosystem conditions, such as health, biodiversity, and climate objectives (European Commission, 2021). EU also makes investments in disaster prevention, readiness, response, and forest recovery after a disaster.

Meanwhile, the practice of deforestation driven by human actions is less noticeable in these steps, and there is no recommendation for how member countries deal with it. Illegal activities and arsonists have a major impact on forest fires in Portugal, Spain, and Italy (Ponte et al., 2019; Ribeiro et al., 2015). More than nine out of ten fires in the EU

are human caused (Trucchia et al., 2022). If no significant progress exists to address these factors at the regional and local level, the problem will worsen.

Transparent forest management monitoring and assessment are crucial for ensuring the delivery of EU objectives, particularly in the transition to a climate-neutral economy, biodiversity, and circular economy ambitions. This requires strategic planning at national and regional levels, backed by transparent governance and coordinated exchange as set out in the proposal for a revised Regulation on Land Use, Land Use Change, and Forestry (European Commission, 2021). Member States should urgently engage in completing the mapping and monitoring of these forests, and ensuring no deterioration until they start to apply the protection regime (European Commission, 2021). Despite the EU noticed monitoring forest data as a primary concern, however, data accuracy and data integration remain issues in the three southern European countries, especially regarding risky land, changes in land use, and forestry landscapes.

This policy was released in 2021, following the Covid-19 pandemic outbreak. It is one of the EU's forest management guidelines. We can observe which aspects are highlighted in the policy, whether they are related to SES factors and subsystems, and how this policy influences the implementation of forest fire prevention in three southern European countries.

The New EU Forest Strategy Implementation in Southern European Countries

The three southern European countries are making progress in implementing key points in the New EU Forest Strategy for 2030. The study analyzes the connections and current level of implementation of the policy's key points in each country. However, the progress is running at a low-to-medium level. In addition, the dissemination of knowledge relevant to this strategy proceeds quite slowly at the local level. This condition creates problems in developing good governance and the division of roles among levels of authority.

Table 2 – Southern European countries progress in implementing the New EU Forest Strategy for 2030 key points

The New EU Forest Strategy For 2030 highlighted points (SES-related factors and subsystem)	Portugal	Spain	Italy
Supporting the socio-economic functions of forests for thriving rural areas and boosting forest-based bio-economy within sustainability boundaries.	Moderate	Low	Moderate
Protecting, restoring, and enlarging EU's forests to combat climate change, reverse biodiversity loss, and ensure resilient and multifunctional forest ecosystems	Moderate	Low	Moderate
Strategic forest monitoring, reporting, and data collection.	High	Low	Low
A strong research and innovation agenda to improve our knowledge of forests.	Moderate	Low	Moderate
Inclusive and coherent EU forest governance framework.	High	Moderate	Moderate
Stepping up implementation and enforcement of existing EU acquis.	Low	Low	Low

*High: the implementation is extremely good

*Moderate: the implementation is average

*Low: the implementation is insufficient

Source: Created by Author, 2024

Despite the New EU Forest Strategy for 2030's significant relationship to SES elements and subsystems essential for southern European countries, its implementation is still insufficient. The policy does not specifically address the problem of forest fires and has vulnerabilities in several aspects. It focuses on sustainable forest management, biodiversity conservation, community involvement, disaster mitigation, and funding. The New EU Forest Strategy for 2030 also noticed climate change and environmental threats to European forestry but did not significantly address forest fire issues, particularly pre- and post-fire mitigation, and limited funds in European countries.

According to Eurostat (2021), EU member states spend just 0.5% of their money on fire protection services. Mapping the development of the forestry economic sector and comparing it across sub-regions has also received less attention. To begin implementing structured schemes and programs in a mission to enhance the economy of the European forestry industry attempts to increase state government expertise, particularly in southern European countries, must be conducted. In addition, The New EU Forest Strategy for 2030, as a policy document, formulates objectives and commitments without specifying how progress towards each objective should be monitored (Lier et al., 2022).

Conclusion

The study discovers both progress and obstacles in EU-stakeholder cooperation in forest fire management. The study's findings and analysis reveal that in the post-pandemic Covid-19 age, there has been development in MLG implementation for combating forest fires in three southern European countries: Portugal, Spain, and Italy. This is characterized by the ongoing implementation of policies, strategies, and programs that encourage participation at the national and local levels. In addition, the study also shows that the EU's policies and initiatives contained in the New EU Forest Strategy for 2030 are linked to the factors and sub-systems in the SES framework. However, the development of MLG in dealing with forest fires remains a challenge in these countries. The three southern European countries have similarly made little progress toward implementing the New EU Forest Strategy for 2030 and have specific obstacles in carrying out the policy's objectives.

EU's recommendations for strategy and coordination on forest fire prevention were developed particularly for Portugal, Spain, and Italy. In the national level and local

context, there are similarities and differences in forest fire management conditions between southern European countries. Portugal has expanded its forest fire management system to local levels, with each district and municipality having a specific commission for protection. During the pandemic, Portugal implemented policies encouraging integrated system management and innovative risk governance models. However, there is still a lack of clear direction on delegation of state management to community control or integrating government-designed methods. Several recommendations for Portugal from this study include that the NGOs and government institutions involved must be able to disseminate knowledge about forest fire management and prevention, as well as understand more about the patterns of ongoing fire management that in each region. The operating system can develop through the integration of scientific and practical information.

The study shows Spain is the most vulnerable of the three countries. Apart from being the least developed in MLG implementation on forestry and forest fires governance, having the highest number of forest fires and the amount of land burned, Spain was also indicated as the most vulnerable due to a lack of forest fire policy in the resulting pandemic age. In the age of the pandemic, Spain's strategic and policy framework, particularly measures to combat forest fires during the pandemic, tended to be reactive and reconstruction focused. Several policies and programs being implemented by the government do not focus on the state forestry sector, particularly forest fires. However, Spain's development demonstrates that an effort is being made to address the problem of forest fires through Multi-Level Governance.

Progress in the post-pandemic age shows Italy faces challenges in decentralized forestry management and fire regime despite progress post-pandemic, requiring consistent data collection for understanding fire trends, identifying causes, and implementing effective strategies. Number of forest fires in Italy remains high among other EU member countries between 2020-2023. However, Italy moving towards a more decentralized forestry management and fire regime. The Italian government also issued several specific policies related to fires and made innovations in forest fire detection.

This study's analysis also reveals how the New EU Forest Strategy for 2030 relates to SES factors and subsystems, as well as how it is implemented in these three southern

European countries. The strategy engages in sustainable forest management, including economic aspects, and benefits from EU forest products, biodiversity, and species conservation through land mapping and related practices, community involvement in every process of forest management, disaster mitigation, and funding from regional to local levels. However, it lacks clear action on forest fires, limited funding, and low focus on forestry economic sector development and sub-regional progress comparison. Furthermore, the three countries have not made significant advancements on the points in the New EU Forest Strategy for 2030 and are facing challenges in implementing them.

In this regard, the study recommends that the EU, governments of southern European countries, and civil society strengthen coordination and collaboration in dealing with forest fires, not only to encourage decentralization of decision-making and cutting-edge methods but also to solve ongoing forestry issues together and develop each stakeholder's functions in forest fire management. These efforts also have a positive impact on strengthening the national resilience of each country.

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