연구논문 「환경정책」 제32권 특별호 2024. 12: 77-103
DOI http://dx.doi.org/10.15301/jepa.2024.32.SS.77
pISSN 1598-835X eISSN 2714-0601

Climate Change and Wildfire Dynamics in South Korea:

A Systematic Review of Research and Policy Implications

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Abstract: This systematic review paper investigates the impact of climate change on wildfire dynamics in South Korea, focusing on changes in wildfire patterns and the adequacy of existing policies. By synthesizing a wide range of research studies, the paper explores how climate factors-such as rising temperatures, altered precipitation patterns, and land conditions-affect wildfire frequency, intensity, and distribution. It systematically reviews existing wildfire management policies, including regional prevention policies, response guidelines, post-fire measures, and broader Korea Forest Service policies. The review identifies key gaps in both research and policy, particularly in adapting wildfire policies to shifting wildfire patterns influenced by climate change. The paper concludes with recommendations for future research and policy development, advocating for a comprehensive, region-specific approach to wildfire policy that considers the ongoing impacts of climate change.
Key Words: Climate Change, Wildfire, South Korea, Policy Evaluation, Systematic Revie

I. Introduction

The impacts of climate change are becoming increasingly visible around the globe, with one of the most pressing manifestations being the rise in wildfire occurrences. These wildfires have far-reaching consequences, resulting in substantial loss of life, severe economic repercussions, and threats to biodiversity and ecosystem integrity (Moritz

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et al., 2014; Jolly et al., 2015). For example, the 2019-2020 Black Summer bushfires in Australia incurred damages exceeding $100 billion (Haque et al., 2023), led to the destruction of over 3,000 home losses (Kemter et al., 2021), and resulted in more than 400 fatalities (Filkov et al., 2020). Similarly, the 2023 Canadian wildfire destroyed over 100 homes and essential infrastructure, displacing more than 200 communities (Jain et al., 2024). The recent 2025 Los Angeles Fires prompted the evacuation of over 92,000 residents, with the total area burned by the Palisades, Eaton, and Hurst fires spanning approximately 60 square miles—an area larger than Paris. The devastation caused by the Eaton and Palisades fires ranks them as the second and fourth most destructive wildfires in California's history. The resulting transnational health issues were also alarming, affecting populations far beyond the fire zones (Yu et al., 2024). Beyond the tangible destruction of property and infrastructure, wildfires undermine regional economies by disrupting tourism, imposing heavy recovery costs, and degrading ecosystems that contribute to environmental stability (Lecina-Diaz et al., 2021).

In South Korea, where approximately 70% of the landscape is mountainous, the risks posed by wildfires are particularly pronounced, threatening both regional stability and national security. As the impacts of climate change intensify, the potential for devastating wildfires increases, amplifying these already substantial risks (Jolly et al., 2015; Mansoor et al., 2022). In parallel with global studies of shifting wildfire patterns driven by climate change, which have spurred a substantial increase in research employing post-fire field surveys and remote sensing techniques, there has been a distinct societal and academic call within South Korea to evaluate the extent to which existing wildfire management policies are adequately aligned with the evolving dynamics

of wildfires (Chang et al., 2024; Jolly et al., 2015; Kim and Kwon, 2023; Kim et al., 2019b; Lim et al., 2019; Park et al., 2023). This growing body of research raises critical questions about how wildfire patterns in South Korea have changed due to climate change and how effectively existing policies are addressing these shifting dynamics. The recent scale of wildfire events underscores the urgent need for adaptive management strategies that enhance resilience and preparedness in the face of the evolving nature of future wildfire risks (Chang et al., 2024; Ryu et al., 2024).

This paper seeks to address two critical questions that arise from these challenges: (1) How have wildfire patterns shifted due to climate change in South Korea? and (2) How effectively do existing wildfire management policies, including regional prevention policies, response guidelines, post-fire measures, and broader Korea Forest Service policies, address these shifting dynamics? By systematically reviewing existing literature on changing wildfire trends and policy responses, this paper aims to identify the strengths and limitations of South Korea's current wildfire management framework and provide recommendations for policy adjustments. Analyzing these issues is essential for developing targeted strategies that enhance resilience, preparedness, and adaptive capacity to the growing threat of wildfires in the era of climate change.

II. Literature Review

1. Global Trends in Wildfire Research

Wildfire research has seen a substantial increase worldwide, spurred by the growing recognition of the risks associated with climate change

and the consequent increase in wildfire frequency and severity (Chen et al., 2024; Jain et al., 2024; Jolly et al., 2015; Yu et al., 2024). This heightened focus on wildfire research has been accompanied by substantial advancements in technology, particularly in remote sensing techniques and post-fire field surveys, which have become integral for studying wildfire dynamics (Bahadori et al., 2023; Chung and Kim, 2008; Jolly et al., 2015; Lim et al., 2019; Park et al., 2019). These improvements in technology allow researchers to collect more accurate and comprehensive data on fire behavior, enabling the development of predictive models for fire occurrence, spread, and impacts (Ahn et al., 2024; Lim et al., 2019; Rashkovetsky et al., 2021; Tran et al., 2023). Remote sensing, in particular, has provided critical insights into global fire patterns, facilitating the detection of large-scale fires and offering more precise assessments of wildfire-induced land cover changes (Hansen et al., 2013; Park et al., 2023; Rashkovetsky et al., 2021). While global-scale research is valuable for understanding shifting wildfire patterns, there is an increasing need for more targeted studies in regions like South Korea, where approximately 70% of the landscape is mountainous (Chang et al., 2024; Kim and Kwon, 2023). With the intensifying impacts of climate change, the risk of catastrophic wildfires grows, further amplifying already substantial risks in such regions (Jolly et al., 2015; Mansoor et al., 2022).

2. Increasing Complexity of Wildfire Patterns in South Korea

In light of a growing body of global research on changing wildfire patterns, South Korea is increasingly focusing on wildfire research as the complexity of these events intensifies, compounded by emerging challenges linked to the escalating impacts of climate change (Chang et

al., 2024; Lim et al., 2019; Park et al., 2023). Numerous studies suggest that disruptions in traditional precipitation and temperature patterns are substantially altering wildfire occurrences, creating a feedback loop of warmer, drier, and thus more conducive conditions to fires, not only during historically high-risk periods but across all seasons throughout South Korea (Chang et al., 2024; Kim et al., 2019b; Lee et al., 2012). Moreover, recent research highlights that the overall number of wildfires in South Korea has risen over the past few decades, mirroring global trends driven largely by anthropogenic causes (Kim et al., 2023; Min et al., 2022). This increase is paralleled by a concerning rise in wildfire intensity and a shift in geographic patterns, with major fires now affecting larger areas—especially in the country's mountainous regions—burning more intensely and for prolonged durations, exacerbated by the impacts of climate change (Chang et al., 2024; Kim et al., 2019b; Kim et al., 2023; Ryu et al., 2018). Given these evolving patterns, there is an urgent need to systematically review the shifting wildfire patterns in South Korea to assess whether current policies and mitigation strategies are adequately equipped to address these rapidly changing dynamics.

3. Wildfire Policies in South Korea

The increasing complexity of wildfire patterns has prompted both academic and societal demands for a comprehensive reassessment of the nation's wildfire management policies (Chen et al., 2024; Jo et al., 2023; Ryu et al., 2024). Several studies have examined the characteristics of current fire management strategies, with those in South Korea often based on traditional seasonal fire cycles (Ha, 2016; Ryu et al., 2024). Furthermore, there has been growing advocacy from both societal and governmental organizations for the development of risk-oriented, rather

than season-based, wildfire management frameworks to better address the emerging challenges posed by climate change and increasing wildfire risk (Jang et al., 2020; Kim et al., 2019a; Lim et al., 2019). Despite these calls for change, it remains uncertain whether existing policies are adequately aligned with the growing body of research that highlights the shifting patterns and escalating risks of wildfires (Choi et al., 2022; Kim and Kwon, 2023; Ryu et al., 2017; Sung et al., 2022). With wildfires in South Korea having substantial social, environmental, and economic impacts, there is a clear need for a systematic review to evaluate the effectiveness of existing policies and to guide future policy development in the face of these shifting wildfire patterns (Kim et al., 2023; Ryu et al., 2018). By consolidating the findings from previous studies, a systematic review of wildfire patterns and policies in South Korea can provide critical insights into the adequacy of current strategies and help identify gaps in wildfire management that need to be addressed in future policymaking.

Ⅲ. Methodology

This systematic review examines the shifting wildfire patterns in South Korea driven by climate change and evaluates the effectiveness of current wildfire management policies in addressing these evolving dynamics. A structured search and evaluation framework was applied to ensure comprehensive coverage of both academic and policy-relevant literature.

1. Search Strategy

The review process began with an extensive search for relevant

academic articles, government reports, and policy documents published until July 2024. Scopus and Web of Science were utilized to retrieve peer-reviewed journal articles in English and Korean, while government databases provided access to wildfire management policies and climate change adaptation frameworks. Search terms included 〈Table 1〉:

〈Table 1〉 Search Terms

	"wildfire" or "wildfires" or "forest fire"
AND	"South Korea" or "Republic of Korea"
AND	"climate change"

Gray literature, such as government reports, was included to enhance the review's comprehensiveness and account for region-specific policy actions, following recommended systematic review practices (Godin et al., 2015; Paez, 2017). Relevant government reports, policy guidelines, and data specific to South Korean provinces were incorporated to provide a more comprehensive overview of the country's wildfire management strategies. The initial search yielded 2,510 studies, which were subsequently screened for duplicates using Covidence, reducing the total to 2,421. After applying inclusion and exclusion criteria as shown in 〈Table 2〉, 97 studies were selected for full-text review, out of which 26 studies were finalized for the analysis 〈Figure 1〉. 〈Appendix 1〉 includes the full list of included studies.

2. Eligibility Criteria

The eligibility criteria were designed to ensure that only studies directly relevant to the objectives of this review were included. Studies were considered eligible if they examined wildfire patterns in South

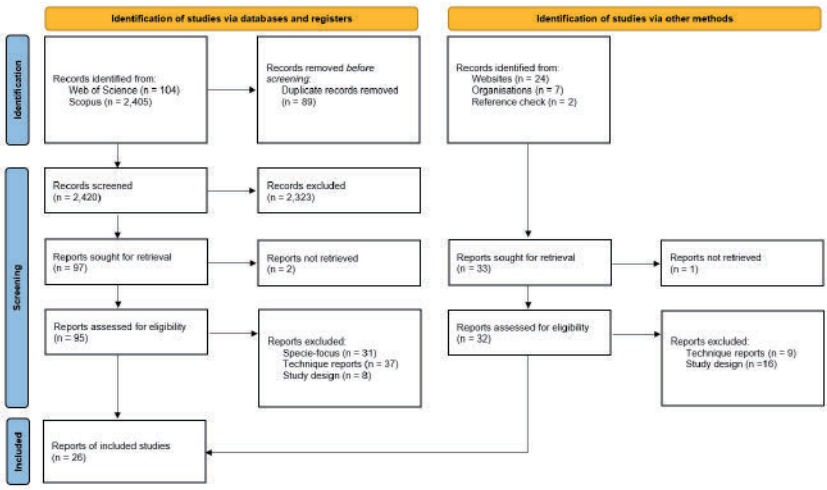
Korea within the context of climate change or evaluated policies related to wildfire prevention, response, or adaptation. Only peer-reviewed articles, government reports, and policy documents in English or Korean were considered to ensure high-quality, region-specific information.

〈Table 2〉 Inclusion and Exclusion Criteria

Inclusion criteria	Context	wildfire patterns and policies in the context of climate change
	Type of publication	peer-reviewed academic journal articles or government reports
	Geographic focus	South Korea
	Language	English or Korean
Exclusion criteria	Context	Studies solely about analyzing types of tree species for fire management or modeling techniques for predicting fire
	Type of study	General climate change scenario study

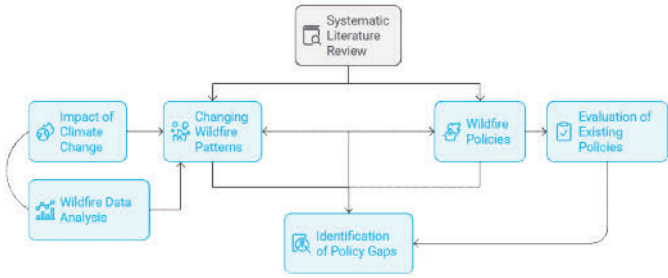
Studies were excluded if they focused solely on species-specific fire behavior, such as research examining tree species that burn more or recommending specific species for reforestation, or on technical methodologies, such as algorithm revisions or sensor efficiency improvements, that did not address the broader wildfire management or policy context. Additionally, studies that focused solely on general climate change scenarios without considering their direct impact on wildfire dynamics in South Korea were also excluded. These exclusion criteria ensured that the included studies were pertinent to understanding both the evolving wildfire risks and the effectiveness of existing management strategies in South Korea.

〈Figure 1〉 PRISMA Diagram: Summary of Search Strategy



The primary goal of this systematic review was to analyze how climate change has influenced wildfire patterns in South Korea and to evaluate the effectiveness of existing policies, addressing the shifting wildfire patterns 〈Figure 2〉. An evaluation framework assessed South Korea's wildfire policies in prevention, response, and recovery measures. Policies were reviewed based on alignment with observed wildfire changes, adaptability to shifting climate dynamics, and integration of international best practices.

〈Figure 2〉 Research Framework



Ⅳ. Analysis and Discussion

1. Wildfire Patterns: Spatiotemporal Changes

1) Frequency Increase

Research demonstrates that the frequency of wildfires in South Korea has generally increased over recent decades, with a substantial proportion attributed to anthropogenic causes (Chung and Kim, 2008; Kim et al., 2023; Min et al., 2022). Climate change has altered seasonal temperature and precipitation patterns in South Korea, with average winter temperatures rising by approximately 4 ° C and relative humidity decreasing by 8%, along with a 17 mm reduction in precipitation (Chang et al., 2024). This altered climate disrupts natural moisture cycles, creating drier conditions conducive to wildfires. Multi-temporal analyses spanning from the 1980s to the 2000s reveal a significant increase in wildfire occurrences, particularly concentrated in urban and eastern coastal areas (Kim et al., 2019b). A time-series analysis of Gyeonggi Province further underscores this trend, indicating a marked increase in wildfire frequency over the past decade (Kim et al., 2021). Furthermore, projections based on diverse climate scenario models indicate that rising surface temperatures and the influence of the El Niño-Southern Oscillation, which disrupts precipitation patterns and elevates the risk of drought conditions across South Korea, will exacerbate the increasing frequency of wildfires, potentially leading to a 7% to 58% increase in the annual occurrence of human-caused forest fire days by the late 21st century (Lee et al., 2012; Lee and Lee, 2022).

2) Escalating Intensity (Scale, Duration)

In addition to frequency, wildfire intensity in South Korea has increased, with fires now consuming increasingly larger areas over shorter durations yet with prolonged burn times. (Kim et al., 2023). The 2022 wildfire season exemplified this trend, with approximately 22,477 hectares burned over two weeks (Chang et al., 2024). Studies highlight that increasingly frequent and severe heatwaves, coupled with more extended drought periods, are contributing to fires of greater scale and duration (Chang et al., 2024; Min et al., 2022; Sung et al., 2010). Notably, the eastern province of Gangwon-do has seen 90% of its major wildfires in areas prone to dry air and high winds, exacerbating the spread and intensity of fires (Kim et al., 2023). Moreover, there is a concerning trend of successive hot-wet extreme events becoming more frequent and intense, which may further exacerbate the scale and duration of wildfires (Min et al., 2022).

Climate-induced shifts also bring about new challenges in wildfire recovery, as high-severity fires are more difficult to recover from, with certain areas unable to return to their unburned states for decades (Ryu et al., 2018). Wildfire recovery in Korea can take 4-6 years for low-severity events, yet high-severity incidents often require over a decade, with some areas taking up to 20 years for full ecological recovery (Ryu et al., 2018). This extended recovery time indicates that each fire season has a lasting impact on the resilience of Korean forests, creating a cumulative burden on ecosystems already strained by climate change. The economic consequences of these intense wildfires are severe, with potential gross regional product declines reaching up to 1.23% in heavily affected areas, especially in South Korea's eastern mountainous regions (Kim and Kwon, 2023).

3) Geographic Distribution

Wildfires in South Korea also have shifted spatially, occurring beyond traditional fire-prone seasons, and expanding into new regions previously considered low-risk (Chang et al., 2024). Over the past 30 years, the frequency of wildfires has increased outside the traditional precautionary periods, indicating a broader vulnerability to fire (Ryu et al., 2024). Between 1991 and 2008, the southwest region experienced the sharpest rise in wildfire occurrences, attributed to climate change that has led to warmer, drier, and less precipitable conditions during early spring (Sung et al., 2010). Historically, there was a pattern of larger fires predominantly occurring in spring and smaller fires in autumn and winter from 1991 to 2005 (Seol et al., 2012). However, these patterns are changing, as drier land conditions persist (Choi et al., 2022; Seol et al., 2012; Shin et al., 2021; Sung et al., 2022). While the eastern part of South Korea currently faces high wildfire risk, certain western coastal areas are projected to become increasingly at risk (Ahn et al., 2024). Furthermore, climate change is likely increasing wildfire vulnerability in temperate, mid-latitude regions where such large fires were previously uncommon (Chang et al., 2024). The impact of climate change continues to expose previously "safe" regions to increased wildfire risk, and projections suggest that vulnerable zones will expand into parts of western Korea previously unimpacted by significant fires by the 2070s (Ahn et al., 2024). This broadened vulnerability underscores the need for a comprehensive, climate-informed policy framework. Forest fire susceptibility mapping in regions like Gangwon-do indicates that geographic factors, particularly slope and drought risk, critically influence wildfire risk, further emphasizing the need for region-specific policies to mitigate wildfire impacts (Piao et al., 2022).

2. Policy Review

1) Prevention Policies

The Korea Forest Service has established prevention measures for high-risk areas, including management plans, access restrictions on hiking trails, and the enhancement of weather observation networks to improve fire prediction capabilities (Korea Forest Service, 2024). Key prevention strategies include establishing disaster management plans for wildfire-prone areas, setting wildfire caution periods and operating wildfire prevention headquarters during those periods, improving wildfire prediction accuracy through an expanded mountain weather observation network, and developing a seasonal and medium-term wildfire risk forecasting algorithm using big data (Korea Forest Service, 2024). The deployment of nearly a thousand forest protection officers strengthens law enforcement against wildfire-related violations, supported by penalties and reward mechanisms designed to increase detection rates and promote public awareness (Korea Forest Service, 2024). Additional preventive efforts include maintaining firefighting equipment and recruiting personnel ahead of the wildfire caution period-January for spring and October for fall (Korea Forest Service, 2024).

Regional prevention measures follow the overall guidelines provided by the Korea Forest Service, with Kyungpook imposing hiking restrictions, Gyeonggi allocating budgets for wildfire management, and the East Coast adopting a smart sensor-based ICT platform for monitoring wildfire risks (Korea Forest Service, 2024). However, the limited adaptive scope of these policies, which align with traditional "wildfire seasons," challenges their efficacy in addressing the year-round

fire risks intensified by climate change (Ha, 2016; Ryu et al., 2024). Recent trends indicate that wildfire frequency has risen significantly during non-precautionary periods, emphasizing the necessity for adaptable policies that transcend seasonal constraints (Choi et al., 2022; Min et al., 2022; Ryu et al., 2024; Shin et al., 2021; Sung et al., 2022).

2) Response Guidelines

In wildfire response guidelines, a key focus is on rapidly extinguishing wildfires; the Korea Forest Service's hierarchical wildfire response framework integrates national, provincial, and city-level resources, coordinating aerial and ground support with local authorities (Korea Forest Service, 2024). The Central Wildfire Prevention Headquarters within the Korea Forest Service coordinates the provincial headquarters managed by the regional forest services and city-level headquarters under national forest management offices (Korea Forest Service, 2024). On-site management is directed by local mayors, governors, or national forest management office directors. Forest Aviation Headquarters within the Korea Forest Service provides aerial firefighting support, while collaboration occurs with military, police, and fire departments. Additional help comes from various organizations, including nearby watchmen, volunteers, and civil defense forces. Despite these protocols, however, deficiencies in information flow during wildfires hinder effective response, resulting in greater economic, social, and environmental losses (Oh et al., 2021).

3) Post-fire Measures

While South Korea has implemented strong reforestation and fire

prevention policies since the 1960s, large-scale forest fires in South Korea, particularly since the Goseong fire in 1996 and the Donghae-an fire in 2000, have prompted the development of standardized restoration strategies (Ryu et al., 2017). For post-fire measures, the focus is on immediate fire cleanup and ecological restoration (Korea Forest Service, 2024). Damage assessments are conducted in major wildfire-affected areas to establish recovery plans and secure separate budgets for disaster prevention (Korea Forest Service, 2024). Additionally, actions are taken against those responsible for causing wildfires, enforcing penalties and corrective measures for violators as outlined in the Forest Protection Act (Articles 53 and 57) (Korea Forest Service, 2024). Post-fire restoration efforts include supplementary planting, soil rehabilitation, and erosion control as primary strategies. Studies indicate, however, that severely impacted areas often require decades to recover fully, suggesting a need for resilient, ecologically adaptive restoration strategies to better support long-term forest resilience under recurring fire risks (Kim et al., 2008; Ryu et al., 2018).

3. Policy Gaps

South Korea's current wildfire policies address prevention, response, and restoration at foundational levels. Despite their comprehensiveness, they show limitations in adapting to the intensifying impacts of climate change. The prevalent "season-based" approach to wildfire prevention, response, and restoration is increasingly insufficient as non-traditional fire seasons grow more hazardous. Projections of more frequent and intense wildfires further complicate wildfire management, with severe economic implications, where potential gross regional product declines could reach up to 1.23% from a wildfire event (Min et al., 2022; Kim and

Kwon, 2023). A study evaluating emergency management practices in Gangwon province highlights a critical need to shift to a risk-oriented approach to better address future wildfire risks (Ha, 2016). In light of this, integrating climate resilience into policy frameworks, through risk-based, rather than season-based, approaches, could offer a more effective management strategy (Ha, 2016; McWethy et al., 2019).

Post-fire recovery efforts in South Korea primarily focus on ecological restoration, including soil rehabilitation and reforestation (Forest Korea Service, 2024; Jang et al., 2020). With such characteristics and studies of post-wildfire locations, the importance of vegetation rehabilitation for mitigating post-fire erosion in South Korea must be prioritized (Ewane and Lee, 2017). However, studies indicate that the recovery process remains challenging, with severely burned areas requiring decades to return to pre-fire conditions (Kim et al., 2008; Ryu et al., 2018). Given the heightened risk of recurring fires in these rehabilitated areas, policies must prioritize resilient, ecologically adaptive restoration techniques that can withstand future climate stresses. Collectively, these findings underscore the urgent need for effective wildfire management strategies to mitigate both environmental and economic impacts in the region.

Enhanced communication strategies are also necessary to improve public awareness and readiness for increased fire risks, as highlighted by the ineffective information flow during the 2017 Gangneung wildfire (Oh et al., 2021). Community-specific risk communication and participatory policy design, where local knowledge and experiences inform regional strategies, would likely improve the public's responsiveness to wildfire warnings and enhance community resilience. Adopting vegetation rehabilitation practices could reduce erosion risks and support long-term resilience (Ewane and Lee, 2017). Moreover, optimizing the

wildfire climate impacts and adaptation model, an implementation of ideal forest management could reduce fire frequency and burned area by 60-70% (Jo et al., 2023).

This study reveals a clear trend of increasing frequency, intensity, and geographic spread, largely driven by climate change in South Korea. The rising temperatures, decreasing precipitation, and shifting seasonal patterns have created conditions conducive to more frequent and severe wildfires, particularly in the eastern and southwestern regions. This aligns with global research, which similarly highlights the exacerbating effects of climate change on wildfire dynamics (Chen et al., 2024; Jolly et al., 2015; Kim et al., 2023). Notably, the observed escalation in fire intensity and scale, with longer burn durations and larger affected areas, underscores a substantial challenge to both ecological and socio-economic systems, as previously identified in studies (Kim and Kwon, 2023; Ryu et al., 2018). However, South Korea's current wildfire management strategies, primarily based on traditional seasonal frameworks, are increasingly insufficient to address these evolving risks. While the Korea Forest Service's measures focus on preventive actions and post-fire restoration, the limited adaptability of these policies to non-traditional fire seasons and the compounded challenges posed by climate change highlight the need for a paradigm shift. Integrating a risk-oriented approach, as advocated by previous studies, is crucial for enhancing resilience and reducing the socio-economic costs of wildfires (Ha, 2016; McWethy et al., 2019). These findings suggest that future wildfire management policies in South Korea must prioritize adaptive, climate-resilient frameworks that consider both the spatial and temporal shifts in fire patterns and incorporate community engagement for more effective risk communication and preparedness.

V. Conclusion

This systematic review highlights substantial shifts in wildfire patterns in South Korea driven by climate change, with increases in frequency, intensity, and geographic variability. South Korea's current wildfire management policies, primarily overseen by the Korea Forest Service, focus on preventive measures, seasonal fire response, and post-fire recovery efforts. However, the efficacy of these policies is limited by their adherence to static "wildfire seasons," which may no longer align with evolving fire patterns due to climate change.

This review identifies several critical policy gaps that limit South Korea's adaptive capacity to effectively address the increasing risk of wildfires. Key issues include an over-reliance on seasonal caution periods that are insufficiently flexible to account for year-round fire risks, limited public risk awareness and communication strategies, and post-fire recovery methods that do not fully account for the prolonged recovery needs of severely impacted ecosystems (Choi et al., 2022; Min et al., 2022; Oh et al., 2021; Ryu et al., 2024). Integrating dynamic, risk-based management approaches into South Korea's wildfire policy framework could enhance adaptability, resilience, and response effectiveness. This extends beyond the concept of basic resilience, characterized by the ability to return to a similar state, to encompass adaptive and transformative resilience (McWethy et al., 2019).

To enhance South Korea's resilience to wildfires, this paper recommends several key policy adaptations. First, implementing flexible fire caution periods based on real-time climate data would ensure that resources and preventative actions are mobilized in response to immediate risks rather than static seasonal assumptions. Second,

improved risk communication strategies, including public awareness campaigns and community-specific protocols, are essential to mitigate the economic, social, and environmental costs of wildfires. National-level campaigns could aim to raise general awareness of wildfire risks, while regional-level communication efforts could address specific vulnerabilities and preparedness strategies tailored to local conditions. For instance, the Kittitas Fire Adapted Communities Coalition in Washington, U.S., has successfully emphasized tailoring mitigation efforts to the unique needs of different communities within the landscape (Edgeley and Paveglio, 2024). This approach has proven to be an effective means of catalyzing sustained and realistic fire adaptation actions. Specifically for South Korea, tailored strategies may include focused fire prevention education for regions with dense forest cover, while densely populated urban areas might benefit more from specific evacuation protocols and preparedness drills. Third, a climate-resilient restoration framework, with an emphasis on adaptive restoration and erosion control, would bolster post-fire recovery in severely impacted regions, helping ecosystems recover more sustainably under ongoing climate stresses.

This study offers valuable insights into policy adaptations by systematically reviewing the literature to analyze changes in wildfire patterns in South Korea and evaluate how related policies effectively address these changes. Nevertheless, it should be noted that this study has limitations. Key among these is the cutoff date for reviewed research, which includes publications up to July 2024. As a result, the analysis may not fully capture the most recent shifts in wildfire patterns or the latest policy updates. Further research is therefore necessary to model the effectiveness of proposed adaptations, especially regarding the

integration of climate data into management strategies. Moreover, long-term studies on broader social, economic, and health impacts of wildfires at the regional level would provide valuable insights into how different communities are affected and how they can better prepare for future wildfires.

In sum, an integrated, climate-informed wildfire management strategy that is region-specific, dynamic, and informed by both international best practices and local insights will be critical in addressing the increasingly complex wildfire risks in South Korea. The proposed recommendations offer a pathway to enhancing both short-term preparedness and long-term ecosystem recovery, ensuring that the country is better equipped to face the escalating challenges posed by wildfires in the era of climate change. Ongoing research and continued policy refinement will be essential to further strengthen these strategies, ultimately safeguarding the health, safety, and sustainability of South Korea's communities and natural environments for future generations.

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〈Appendix 1〉 Included Studies

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Received: 31 October 2024
Revised: 13 December 2024
Accepted: 27 December 2024