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Network Management and Haze Mitigation: A Qualitative Study of Local Governance in Mae Tha District, Thailand

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Abstract

Background: While the Thai government has established unified operational frameworks to address the recurring haze crisis, these top-down measures often fail to account for the unique environmental and social conditions of specific regions, leading to inconsistent results in local implementation.

Objective: This research analyses the causes, circumstances, and management strategies of haze pollution in the Mae Tha District of Lamphun Province to propose localised solutions tailored to the area's specific context.

Methodology: The study employed a qualitative research design, incorporating documentary analysis, field observations, and semi-structured interviews with 17 key stakeholders. Informants were selected based on their significant involvement in regional haze management. Data were synthesised from both primary and secondary sources to ensure a comprehensive overview.

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Results: Findings indicate that the primary cause of haze in the region is linked to its topography, which is dominated by mixed deciduous forests. These ecosystems are vital for wildlife and biodiversity products, which are deeply intertwined with local livelihoods, including wild food foraging and hunting. Current management relies on loose networks of central, regional, and local representatives primarily focused on strict law enforcement.

Conclusion: Effective haze management requires moving beyond a singular national framework. Success is dependent on the ability of central and regional agencies to build trust and interdependence with local communities and the private sector.

Unique Contribution: This research highlights critical gaps in national haze policies, emphasising the necessity for localised studies that address the root causes of pollution by bridging the divide between state frameworks and community ways of life.

Key Recommendation: Government policy-making must remain flexible and responsive to the specific environmental and social contexts of each area. A primary, rigid framework is insufficient for solving the haze problem across diverse regions of the country.

Keywords: collaborative governance, haze pollution, network management, stakeholder participation, community livelihoods.

Introduction

Air pollution is responsible for 11.65% of deaths worldwide. PM2.50 can cause a wide range of diseases, but the one that affects most people is lung cancer. PM2.50 can penetrate deep into the lungs, irritate and corrode the alveolar walls, resulting in impaired lung function (Kladsomboon et al., 2025). Air pollution is a global issue. A factor indicating that air quality management problems are increasing annually is the number of academic articles. Santoso et al. (2024) studied from 2019 to 2021 and found that the number of related articles has continuously and rapidly increased, with more than 300 articles proposing solutions to various air quality management problems. However, four topics have not been mentioned or have not been studied much: mapping, air pollution modelling, dynamic systems for air quality management strategies, and spatial analysis. Similarly, Yin's study proposes an important and challenging research topic on air pollution that should be explored in the future: spatial and temporal analysis of air pollution by studying the changes of pollutants in each area and over time in detail (Yin, 2025).

Government management aims to create a model to determine the main causes of wildfires and haze, even though each area has different topography and public activities, which can cause fires and haze to varying degrees. Similarly, the work of the Thai government and public sector agencies has attempted to establish various measures and guidelines to serve as a framework for operations to ensure consistency and a unified direction, without taking into account the differences of each area in considering solutions. In addition, knowledge about the relationship between topography, climate, and wildfire events is still scarce. Therefore, previous management has not been effective enough to control wildfires each year (Pardthaisong et al., 2018).

Haze pollution in Thailand occurs seasonally, from December to February each year. PM2.5 emissions in Thailand originate from many sources, including automobiles and outdoor

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biomass burning/factories, which vary significantly by region. In the Bangkok Metropolitan Region, the primary contributors are traffic emissions (43.7%), agricultural field burning (24.0%), and industrial factories (4.46%). In contrast, rural areas experience higher emissions from wildfires and biomass combustion. These sources of air pollution, combined with atmospheric inversions from cooler winter temperatures and lower air pressure, result in stagnant air masses that cannot rise into the atmosphere, leading to calm winds and the accumulation of airborne pollutants (Chinnawuth, 2025; Wongtongtair, 2025).

Mae Tha District, Lamphun Province, a case study, is located in the upper northern region of Thailand. This area is continuously affected by haze, particularly during February and April, when wildfires and open burning are most prevalent (Kliengchuay et al., 2021). The primary cause of haze is wildfires, particularly over the past 4-5 years. While wildfires have become more severe, they remain largely unresolved. Currently, fuel management is primarily used, with selective burning occurring before February to minimise damage. However, these efforts have not been very successful, as the wildfire situation in the area remains severe and causes widespread damage.

This research focuses on qualitative spatial analysis. It explores and describes patterns of phenomena related to the problem in order to identify trends and plan future responses to address the problem. It includes causes, circumstances, and current specific management of the haze problem in Mae Tha District, Lamphun Province, problems, obstacles in implementation, and analysis of approaches to managing the smog problem in order to effectively address the problem in the future.

Literature Reviews

Collaborative governance refers to a system of governance where government agencies directly participate with non-government stakeholders in formal collaborative decision-making processes. It has six key characteristics: (1) Initiated by a government agency or institution (2) participants include non-government entities, (3) participants directly contribute to decision-making, not merely as advisors, (4) formally established and regularly met (5) a consensus-based goal, and (6) the focus of collaboration is on public management. Key variables that serve as starting condition for such work include: (1) imbalances between resources or power among stakeholders (2) stakeholder motivations for collaboration (3) past history of conflict or collaboration among stakeholders (4) facilitative leadership, which stimulates creativity and intervenes to encourage stakeholder participation, including empowering weaker stakeholders (5) institutional design, referring to the establishment of basic rules and procedures for collaborative work (6) the collaborative process begins with face-to-face dialogue, face-to-face dialogue is considered crucial in breaking down barriers to communication, the next step is trust building, which is a difficult step, but once successful, it leads to the next step: commitment to the process. This is the most important factor in collaborative work, requiring a willingness to abide by the results of jointly made decisions. A high level of interdependence among stakeholders tends to increase commitment to collaboration. The next step is shared understanding, which is a common understanding of defining the problem and the knowledge to solve it. Finally, intermediate outcomes are achieved through small wins from collaboration (Ansell & Gash, 2008). Key factors influencing effective implementation of the PM 2.5 policy targets include network information, participation, equality, and shared decision-making within the network (Yodmongkol et al., 2025).

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Stakeholder and participation concepts, in addition to management, are key elements in a network. They can be divided into two groups: primary stakeholders, those with formal ties to an organisation or social issue; and secondary stakeholders, those less directly involved, who can influence or be influenced by that organisation or issue. Environmental stakeholders are those outside the organisation's operating environment who may be advocates or influencers, and may be a combination of both. The relationship with the interests they attract has an interesting dimension of stakeholders: economic equity and the influencer's interest in the power dimension. External stakeholders may have formal, economic, and political power (Gomes, 2006). In environmental policy issues, the aforementioned stakeholders are the public. In the concept of participation, citizens can directly or indirectly oversee and participate in stakeholders' decision-making regarding government policies, plans, or programs. Participation occurs through networks of government agencies and other entities, providing opportunities for participants to enhance their capacity to be democratic citizens and contribute to sustainability in achieving public value. Public participation has a variety of purposes, including compliance with legal requirements. By embodying shared ideals for the advancement of democracy and social justice, as well as enhancing understanding of public problems, exploring and generating potential solutions for higher-quality policy and planning, participation plays a crucial role, reflecting public values and numerous other public benefits from effective citizen participation. Key tenets of participation theory are (1) Legitimacy: Public participation ensures that government policies and policy options are legitimate, conditional on public acceptance, and responsive to public needs; (2) Diversity and Inclusiveness: In this regard, stakeholder analysis and conflict management are essential to ensure that disadvantaged and marginalized groups are considered; pursuit of understanding of environmental resource issues and options through negotiation, and emphasizing public consultation to gather comprehensive information; and (3) Expertise and Participation: Integrating diverse perspectives into decision-making through public participation, prioritizing expert and general knowledge, that is, local knowledge, and the contextual experiences of those living in the context of the decision problem to address it (Quick & Bryson**,** 2016).

Public and stakeholder participation, commonly found in environmental management, can be classified and characterized into three main modes: (1) bottom-up participation, initiated by interest groups or the public; (2) participation based on the type of work, motivations, and outcomes of driving participation, with different motivations typically associated with different outcomes; and (3) different forms of participation, often based on the ongoing exchange of information or knowledge, from a basic approach of information flow to the public and stakeholders, communication, consultation, and collaborative deliberation (Reed et al., 2018). Stakeholders promoting air pollution prevention and control strategies should include the following: environmental advocacy groups, industries and businesses, communities and citizens, scientific and academic communities, regulatory agencies, engineering and technical experts, public health advocacy groups, researchers, agricultural producers, waste management and recycling companies, government agencies, community organizations, healthcare providers, educators, individuals and households, health and safety professionals, and international organizations (Jainontee et al., 2023).

Methodology Research

Target Population/Key Informants: The target population consisted of representatives from government agencies, the private sector, civil society, non-profit organisations, and residents

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of Mae Tha District, Lamphun Province, which is divided into 6 sub-districts and 71 villages. In the first step, simple random sampling was used to select one representative sub-district from all 6 sub-districts. However, upon entering the research field, key informants mentioned the fires in Masop Sao Sub-district, so the researchers collected additional information from key informants in Thaop Sao Sub-district. Specifically, the snowball method was used to select key informants. Key informants were divided into 4 groups, totalling 17 individuals: 8 local residents; 4 firefighting officials in Mae Tha District; 3 civil servants and government officials from agencies involved in the government's haze mitigation efforts; and 2 environmental experts, particularly those in the area of haze pollution.

Instrument/Data Collection: The research instrument consisted of semi-structured interviews, observation form. Data collected from primary documents, a physical and environmental survey of the community, and observations and the interview is divided into general interviews, which are interviews when a specific event occurs, asking for general information about the event; key informant interviews, which are interviews with people who have specialized knowledge and can provide better knowledge and details than other people; and in-depth interviews with key informants, which provide detailed and in-depth explanations of issues that the researcher need insight into.

Data analysis: Analyse data using content analysis, which consists of documents, interviews, observations, and field notes. The inductive method is used, which involves interpreting the data and drawing conclusions by finding meaning in phenomena or issues. The emphasis is on interpreting and understanding situations or relationships of people through the experiences of the people who own the stories, focusing on descriptive methods to provide details of the facts that occurred within the context of the phenomena. Content analysis consists of four main steps: coding, categories, concept, and assertions/theory based on Saldana's model (Saldana, 2013).

Table 1: Content analysis process

Coding	Categories	Concept	Assertions/Theory
Mixed deciduous forest Drought Hunting Forest gathering	Way of life	Community history	The causes of the haze problem
Government agencies Community leader Private sector People	Stakeholders		
Formal Informal	Relationship	Network management	Collaborative governance
Instruments Skill Budget Technology Information	Resources		
Burning Prohibited Rules	Command	Enforcement	Problem solving approaches
Collaboration	Interdependency	Participation	

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Campaign Resource allocation Support		
Experience Knowledge Climate change Effects	Perception	Awareness

Source: Author's analysis from data collected

Results

Local context, causes, and haze pollution problem situation of Mae Tha District. Mae Tha District is located primarily in highland and mountainous terrain, with an elevation of approximately 325-1,373 meters above sea level. The plains are surrounded by mountains that range oriented northeast and southwest; the watershed in the area aligns with the mountain ranges. The general climate is summer, beginning in March each year, with an average temperature of 33 degrees Celsius. The rainy season begins in June each year, with a rainfall of 103.25 millimetres, and the winter season begins in November each year. Mae Tha District has a long dry season and is extremely hot in summer. In Thailand, the rainy season runs from June to September, the winter season from October to February, and the summer season from March to May; both winter and summer seasons are characterised by dry weather.

Table 2: Compare the summary of PM 2.5 in Mae Tha district between March and July (Time period March 1-31, 2025 and July 1-31, 2025)

Sub-district	March			July		
	Monthly average	**Maxi-mum**	**Highest date**	**Monthly average**	**Maxi mum**	**Highest date**
Tha Kat	59	97	23/3/2025	13	22	11/7/2025
Tha Pla Duk	59	98	23/3/2025	13	22	11/7/2025
Tha Sop Sao	60	100	23/3/2025	14	23	11/7/2025
Tha Khum Ngoen	59	97	23, 28/3/2025	14	22	11/7/2025
Tha Mae Lop	58	94	28/3/2025	13	20	11/7/2025

Source: Created by the authors

In Table 2, which compares PM2.5 levels during the rainy and dry seasons in Mae Tha district. It shows that PM2.5 levels in the dry season are higher than in the rainy season, with the monthly average exceeding the legal standard of 50 micrograms per cubic meter (50 µg/m³) over a 24-hour period, while the PM2.5 level on the day with the worst air quality of the month was almost double.

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Table 3: Compare of fire area between 2024 and 2025

	2024	2025	Compare the difference (percentage)
sub district	**Damaged area (acres)**	**Damaged area (acres)**	
Tha Kat	295.17	370.90	+ 25.87%
Tha Pla Duk	650.19	339.06	- 47.81%
Tha Sop Sao	755.77	1,208.31	+ 59.81%
Tha Khum Ngoen	126.52	106.03	- 16.25%
Tha Mae Lop	38.75	169.17	3.36 times higher
Total	1,865.75	2,192.83	+ 17.55

Source: Created by the authors

In Table 3, it is found that the total damaged area in 2025 increased by 17.55 percent over 2024.Community History: The community has been migrating to the area for over 100 years. In the early stage, foraging and hunting were the primary occupations due to the unfavorable conditions for agriculture. In the 1960s, agriculture began to expand, with tobacco cultivation initiated by Siam Tobacco Co., Ltd. The area was cleared for agricultural purposes in the lowlands and streams, and trees were cut down to sell to the company for leaf curing. Furthermore, the cultivation of various annual crops began. For commercial distribution to urban areas, such as cucumbers and bell peppers. The expansion of agricultural areas for commercial crop cultivation has caused forests and resources to be rapidly destroyed and degraded. Afterward **r**elevant government agencies have therefore begun to manage natural resources in the area, especially forest resources. In 1975, Doi Khun Tan National Park was established to preserve the forest area's richness and serve as a watershed, even though it had already been declared a national forest reserve in 1959.

Mae Tha district is currently divided into two zones: the northern and the southern zone. The occupations of the people in these two zones differ. The northern zone primarily engages in dairy farming, with some cultivating corn (baby corn), rice, and orchards, especially longan. The upper Tha River basin is more fertile and suitable for agriculture than the southern zone. The area consists of mixed deciduous forests, including teak and rosewood, but some forests have been destroyed and encroached upon, particularly in the lower reaches of the upper Tha River basin in Tha Pla Duk subdistrict. The southern zone comprises five subdistricts: Tha Sop Sao, Tha Kad, Tha Khum Ngoen, Tha Thung Luang, and Tha Mae Lop. The majority of the population is engaged in wood carving, orchards, and general labour, including agriculture, construction, and employment as employees of companies in the Lamphun Northern Region Industrial Estate. Only a small percentage works in the government sector. The majority of the area is protected forest, and the people do not own the land. This area consists of steep hills and plains between streams. However, the soil is not very fertile, consisting of sandy loam and laterite, making it easily eroded, especially in the area from Tha Sop Sao subdistrict down to Tha Khum Ngoen subdistrict. The Tha River basin dries up during the dry season and floods during the rainy season. Many forest areas in this zone are severely degraded due to a lack of maintenance. Illegal deforestation is prevalent in the area. The mountainous terrain limits crop cultivation, making agriculture impossible. Harvesting forest products has become a viable alternative for the local population. The forests are mixed deciduous, with both open and dry deciduous forests, providing food and habitat for wildlife. Forestry, hunting, and gathering

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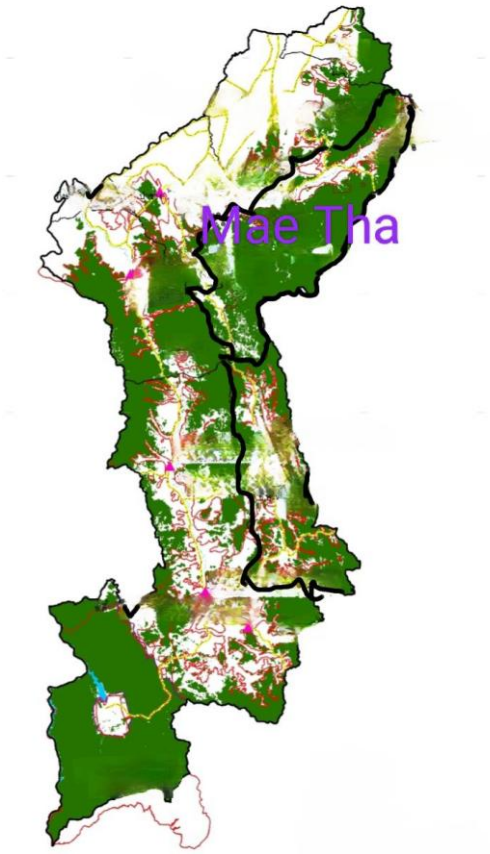
forest products have long been primary occupations, not merely secondary ones. Burning the forest for easier harvesting and hunting is a deeply ingrained cultural practice rooted in traditional beliefs. The burning causes the sprouting and regrowth of certain plants, some of which are not consumed by humans but become food for wild animals. This creates a food source to attract and hunt these animals. Newly sprouted plants that can be harvested and sold include mushrooms and leafy shrubs, particularly melientha suavis, which fetch high prices.

Mae Tha District is a renowned market for forest products in upper northern Thailand. This reflects several key economic factors affecting the local population: forest products obtained through gathering and hunting are in high demand and have enjoyed consistent popularity; and forest products are raw materials without cost, requiring only time and labour for harvesting with no financial investment. This is not only sufficient for the community's subsistence but also allows them to sell their produce for income. These economic factors attract labourers from other professions to the forest to forage for food and hunt. Relevant government agencies in the area have attempted to create jobs and alternative livelihoods, such as promoting carving, weaving, and embroidery to curb the practice of foraging in the forest, they have been unsuccessful due to the lack of a sustainable market. At the same time, these are crafts that are difficult and require meticulous attention to detail.



The total forest area of Lamphun Province is 1,610,337.95 rai, or 57.54 rai, according to a survey conducted in 2024. Forests were found in every district, but Mae Tha District has the largest forest area in the province, as shown in figure 1
There are 30 community forestry projects in 5 sub-districts.

Figure 1 Forest area of Lumphun province

Network management for solving haze pollution problems is loosely based solely on government agencies and the leaders; community leaders' participation is based on the authority granted by the government. The private sector and the general public have not yet joined the network, as it does not align with the local way of life. People will participate or cooperate if

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community leaders can develop infrastructure to promote and develop the local economy, they will gain public confidence and cooperation in preventing and solving forest fire and haze pollution problems this case occurred in Village No. 16, Tha Sop Sao Subdistrict, the most developed area in the southern region it is a center of all the district's utilities and infrastructure, including the district office and hospital and pig farming is a large-scale industry in the area, creating jobs and income for the people.

Regarding resource allocation, particularly the budget, differences exist between the central government and local governments. Local governments believe that delegating tasks to agencies should involve increased budgets or additional resources for special or urgent missions. The central government, on the other hand, believes that local governments are responsible for their own areas, including public services, public health and hygiene, the environment, disaster prevention and mitigation, and responding to the needs of local residents therefore, the primary responsibility for preventing and mitigating haze pollution problems lies with local governments, primarily in the areas of environment, public health, and hygiene. Currently, the budget allocation for forest fire prevention and control missions to the local government falls under the general subsidy budget. Local governments are required to carry out their assigned tasks, depending on the type of organisation. For example, municipalities are required to perform 25 tasks under the general subsidy budget. Comparing this to the total budget allocated to local government, with the budget allocated for forest fire prevention and control missions in fiscal year 2025, this represents only 0.0035% (total subsidy budget to be allocated to local administrative organisations: 378,545.1219 million baht; operational budget for forest fire prevention and control missions: 132.578 million baht). Furthermore, the budget will be allocated through the Department of National Parks and the Department of Forestry, which are the agencies directly responsible. Local governments are awaiting increased budget allocations, as this is an urgent and recurring problem every year during the dry season.

Network relationships: There are two types of relationships in a network: formal and informal. Government agencies have hierarchical authority over their agencies. The provincial governor is responsible for enforcing orders from relevant agencies to address the haze problem. This is policy-based enforcement. Formal, collaborative relationships occur within government agencies specifically tasked with suppressing forest fires; however, the above is an overview of the entire network, but operating within Mae Tha District, the commander is the District Chief, who oversees relevant regional agencies at the district level, local administrative organisations, and village headmen to jointly address the problem. Therefore, the centralised management centre resides in the province. The District Chief manages the network at the district level operations are conducted in accordance with regulations and rules. Policies, goals, and operational plans are established by central agencies and transmitted directly to regional government agencies. These plans are then deployed to the local areas under the command of the governor and district chief. Local residents are subject to law enforcement by issuing provincial ordinances prohibiting burning for specific periods. In 2025, the province implemented a year-round burning ban to mitigate the increasingly severe haze pollution problem.

Stakeholders and participation in network are divided into government agencies and the public, government agencies include Lamphun Province, represented by the provincial governor; the Lamphun Provincial Natural Resources and Environment Office; the Lamphun Provincial Disaster Prevention and Mitigation Office; the Doi Pha Mueang Wildlife Sanctuary; the Pha

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Mueang Forest Fire Control Station; the Special Forest Fire Suppression Operations Unit of the Forest Fire Prevention and Suppression Office of the Department of National Parks Wildlife and Plant Conservation which is staffed with specialized forest fire suppression expertise; and Mae Tha District, represented by the district chief, district agricultural officer, and district public health officer. Local administrative organisations include 7 municipalities, 10 subdistrict administrative organisations, village headmen, and local residents, including forest fire volunteers. The private sector in the area has not participated in addressing the haze pollution problem, since businesses related to agricultural products and handicrafts are less affected than the service and tourism sectors.

Public participation in solving the haze pollution problem in Mae Tha District involves participation from government agencies in a top-down manner, based on the exercise of authority by leaders. This is legal authority within their responsibilities, with penalties for non-compliance. This involves acknowledgement and recognition, but lacks participation in discussions and decision-making.

Problem solving approaches, currently available solutions include strict law enforcement, forest logging restrictions, volunteer campaigns to help extinguish forest fires when they occur, and allocation of resources and equipment appropriate for the work area, which requires motorcycles, air blowers, and transceiver (walkie-talkie) for communication, next is to anticipate social phenomena that will evolve with the dynamics of the next generation's lifestyles or the shifts in generations meanwhile, government agencies must continue campaigning to raise public awareness of the negative impacts of the problem, fostering their absorption and application in their daily lives. In the case of the haze pollution problem in Mae Tha District, reliance on forest harvesting and hunting is declining compared to the past. Therefore, these problems are likely to decrease in the long term. Importantly, global warming and climate change are affecting the local population directly, such as rising temperatures and seasonal variations. Relevant agencies should promote and educate people about environmental conservation and coexistence with forests to address environmental problems sustainably and comprehensively, not just limited to wildfires and haze.

Discussion

The causes of the haze problem in this area stem from the geographical features, including high and complex mountains, limited agricultural land, and the lowland areas between the mountains and the mixed deciduous forest, which sheds its leaves in the dry season, contributing to fuel accumulation and the risk of forest fires. Furthermore, the local people's livelihoods include foraging and hunting, which are primarily based on the belief that burning forests will enhance the growth of forest products and facilitate hunting. These internal factors are interconnected with external factors, namely the capitalist economy and the market economy of the local forests. The locals burn agricultural waste to prepare the land for planting during the rainy season, a cost-effective and less costly method of waste management. However, this factor has little impact due to the limited agricultural land available, and authorities have greater control over it than other factors who disobey and burn agricultural waste will have their farmland, which the state has allocated, confiscated.

Current air pollution management practices are implementing a network-based management approach. Mae Tha network is a loose network that exists between government agencies and

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community leaders, citizen participation in the network is slight. The government determines measures and policies, establishes action plans for implementation, and delegates responsibilities to key agencies. Each agency develops different strategies, focusing primarily on its own mission. Citizen participation is limited to implementing government policies, not participating in policy-making this is similar to China, where local governments, in this case local administrative organizations, prioritize central government participation over actual policy implementation (Xu, 2020) as a result of Thailand's long history of centralized governance, decentralization began in earnest with the promulgation of the 1997 Constitution and the 1999 Act on the Decentralization Plan and Procedures for Local Administrative Organizations. Not only do government agencies remain entrenched in a top-down approach, but citizens also remain tied to their leaders and those in power. Participation in networks to collaborate with the government is therefore only temporary when those in power leave the area; citizens also withdraw from the collaborative network. Furthermore, the imbalance of power among stakeholders, with the government having more authority than the private sector and the public, is a significant issue. The diverse origins of government agencies contribute to the fragility of the relationship, making conflict easily arise due to the institutional nature of this collaboration, which lacks regulations or penalties. It is consistent with the explanation by Ansell and Gash (2008) that the starting conditions for collaboration among both public and non-public sector stakeholders lie in imbalances in resources or power, motivations, visions, and past collaboration history, as in the past conflicts or disagreements will inevitably lead to distrust and ultimately, failure of collaboration governance.

The solutions are divided into two phases: short-term (1) strict law enforcement to manage goals. This research shows that strict law enforcement can prevent problems to some extent. If there is no strict law enforcement, the problem may be more severe than the current situation. (2) Promoting economic factors, creating jobs and income for people to avoid going into the forest, hunting, and harvesting forest products. If local people have a main occupation that generates income throughout the year, it will help reduce the need to go into the forest to hunt and harvest forest products.

Long term, include (1) providing knowledge, understanding, discussion, exchanging opinions, training, and building cooperation with the public, which will enable the resolution of the haze problem. This is consistent with the study of Jainontee et al. (2023) and Reed et al. (2018), such as improving prevention knowledge, increasing risk perception, cultivating protection behaviour, and intensifying social influence. This involves engaging in the exchange of information or knowledge, and the flow of information to the public and stakeholders through communication, consultation, and collective reflection. This aligns with the description by Ansell and Gash (2008), in terms of developing better relationships with stakeholders and developing more complex collaborative problem-solving learning models, particularly considering factors of time and trust. The above actions will lead to adjusting the attitudes of the new generation to avoid perpetuating false beliefs about forest burning, including taking time to change the lifestyles of the next generation. During this waiting period, government agencies still need to campaign to raise public awareness of the negative impacts of the problem, to foster absorption and application in the ways of life. The study of Pardthaisong et al. (2018), which studied the resilience building of Chiang Mai Province through various sectors, for example education, government, private sector, and local communities, over the past 10 years, between 2007 and 2016, it shows remarkable progress in the resilience of Chiang Mai people, from response to recovery, impact mitigation, and preparation for long-term sustainability at

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the community/village level although there is a limitation in that there is no opportunity to participate in decision-making or policy-making at a high level, it is only up-to-down implementation of government policies. Therefore, allowing sufficient time for public participation is a crucial variable. (2) Allocating an adequate budget to relevant agencies for fire prevention and suppression activities to create a new organisational model with a horizontal working process and resource mobilisation within the network by transferring power from the government sector to other organisations that have higher efficiency in their work (Naratippakorn et al., 2019). At the same time, interdependence among the various groups within the network should be promoted to address these problems (Tantrachin, 2022), this aligns with the description by Ansell and Gash (2008): Interdependence fosters a desire to participate and a commitment to collaboration. (3) Promoting leadership, especially community leaders who have influence over the public, to persuade people to value and cooperate in forest conservation, which will lead to a reduction in the problem of haze from forest fires. However, in the local community context of Thailand, community leaders may use interaction based on the concept of social exchange and communication that stimulates emotional connection with the situation, showing kindness, empathy, and listening to problems. These methods can build trust and confidence among the people more than because of the deeply ingrained culture of trust and obedience to leaders; they cannot be leaders who facilitate, embrace, empower, or help mobilise allies into a collaborative context as described by Ansell and Gash (2008). However, there is still a correlation in the factor of trust, as Ansell and Gash (2008) explained that trust is a factor in making collaborative work effective, but trust takes time to build and cannot happen quickly.

Conclusions and Recommendations

Government management aims to establish a model for identifying the primary causes of forest fires and haze, although each area has unique topography and population activities, which can contribute to varying degrees of forest fires and haze. Knowledge about the relationship between topography, climate, and forest fires is scarce; therefore, previous management practices have been ineffective in controlling forest fires each year.

This research concludes that in Mae Tha District, Lamphun Province, which is located in the upper northern region of Thailand, topography, ways of life, and People's activities are the primary causes of forest fires, which contribute to haze and air pollution. The private sector is not involved in the network approach, as economic activities are not significantly affected inversely; some benefit from burning forests for hunting and gathering, except for the inevitable health impacts that affect everyone in the area. Consequently, a weak network, a clearly effective solution involves strict law enforcement and waiting for a transition period for a new generation, which will transform destructive forest use into creative and sustainable forest use. Based on the research findings, a model for managing the haze problem in Mae Tha District can be developed as shown in Figure 2.

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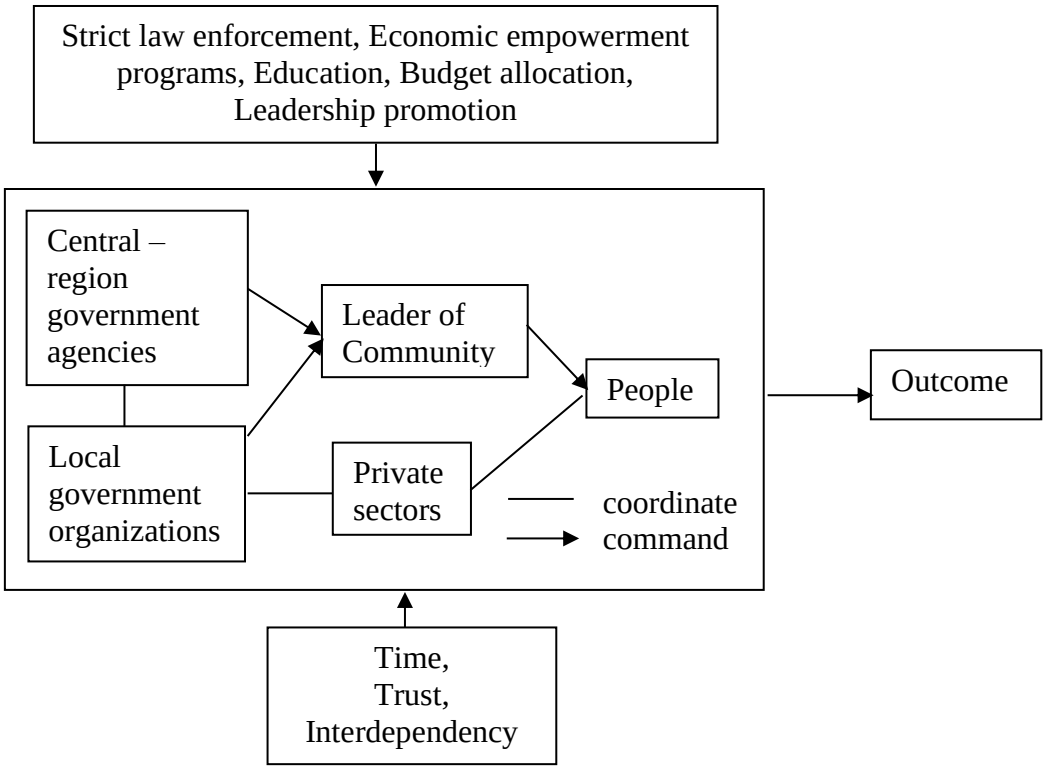

Figure 2: Developing a model for managing haze in Mae Tha District

Declarations

AI Use Statement: The authors confirm that no Artificial Intelligence tools were used in the writing or production of this manuscript.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author, Thanarin Harnkiattiwong, Teeputai Saengas, Siriwan Chobthamasakul, upon reasonable request.

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Conflict of Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval: This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Human Research Ethics Committee (IRB), Rajamangala University of Technology Thanyaburi, under the approval number CCA No. 32 RMUTT_REC.No.Exp32/2025.

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