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Knowledge, Attitude and Behavior of Social Forestry Groups Members towards Mitigation Actions in the Forestry Sector

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Abstract

Social Forestry Groups (KPS) are the main target for implementing forestry sector mitigation activities at the site level, therefore the success of forestry sector mitigation is largely determined by the contribution of KPS involvement. The purpose of this study is to analyze whether the mitigation activities will be successfully implemented by KPS by measuring knowledge, attitudes, behaviors associated with the role of each member in the KPS institution and how the performance of the KPS is good or still needs to be improved. This study was conducted in the Management Area of UPTD KPH Region XI Kikim Pasemah with the research objects of KTH Luang Kering and KTH Sungai Geruntang from July to September 2023. The research method used is a descriptive method with a qualitative approach. The results of the study showed that the level of knowledge of KPS members regarding climate change (10.42%) and mitigation (12.5 %). The respondents' attitudes showed a positive response to forestry sector mitigation activities (T Score> 50%). The behavior of most respondents towards the implemantation of mitigation activities by groups is not good, even though their attitudes support the implementation of mitigation actions, they stil play participatory role in climate change mitigation activities.

Introduction

The energy and forestry sectors are the two largest contributors to greenhouse gas emissions. Therefore, Indonesia aims to achieve a greenhouse gas emission level of -140 million tons CO2e by 2030 and a target of carbon neutrality/net-zero emissions by 2060 through the implementation of the Operational Plan for Indonesia's FOLU Net Sink 2030. The forestry sector holds the largest share in the target of reducing greenhouse gas emissions by 60% (Murdiyarso & Ambo-Rappe, 2023; Prayitno et al., 2013). In the Enhanced National Determined Contribution (ENDC) document of 2022, Indonesia states that the forestry sector's targets will be achieved through the following policy measures: 1) Reducing emissions from deforestation and forest degradation, 2) Increasing carbon absorption capacity in natural forests, 3) Enhancing carbon absorption in land systems, 4) Reducing emissions from peat fires and decomposition, and 5) Law enforcement.

Based on the Minister of Environment and Forestry Regulation No.SK.168/MENLHK/PKT/PLA.1/2/2022 regarding Indonesia's FOLU Net Sink 2030 for Climate Change Control, the implementation of climate change mitigation activities in the forestry sector is carried out by all working units within the Ministry of Environment and Forestry (KLHK) at both central and regional working unit levels (UPT) in collaboration with local governments, the business sector, and the broader community, through structural program work, partnerships, and community empowerment. The Provincial Government of South

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Sumatra, through the South Sumatra Forestry Service, carries out its mitigation actions in 14 (fourteen) Technical Implementation Units of Forest Management (UPTD KPH), with the main target of mitigation actions being the community, both individuals and groups, operating in or around forest areas. The flagship activity of the South Sumatra Forestry Service for mitigation action is Social Forestry (PS), involving 32,113 households organized into 211 social forestry groups with an area of 133,390.23 hectares (Social Forestry Acceleration Working Group (Pokja PPS) South Sumatra, 2023).

UPTD KPH Region XI Kikim Pasemah is one of the managers of protected forest areas under the South Sumatra Forestry Service, where the existence and function of protected forests are crucial for maintaining water management, carbon absorption, and protecting flora and fauna. Therefore, the mitigation activities conducted by UPTD KPH Region XI Kikim Pasemah are essential, and the results must be optimal to minimize or reduce the impacts of climate change by enhancing mitigation actions or activities. Within the protected forest area, there are communities or groups of communities that are legally granted permits to manage the area in accordance with the permissions issued by the Ministry of Environment and Forestry, specifically those who are part of the Social Forestry Groups (KPS) (Rahayu et al., 2023; Suryaningsih, 2024; Palengkahu, 2023).

The role of KPS in managing the area, institutional management, and effective business management is vital for improving community welfare while maintaining environmental sustainability (Supriatna et al., 2024; Tadesse et al., 2013; Molavi et al., 2020). However, members of KPS do not fully understand their roles in contributing to climate change mitigation actions. Various reasons underpin their actions or behaviors, which may stem from a lack of knowledge, absence of socialization, reliance solely on experience, and inadequate law enforcement. According to Tole (2010), the economic function of community forests, human resources (HR), and inadequate accessibility are factors that hinder community behavior in the conservation of community forests.

KPS members, who are spread across all areas of forest management within the South Sumatra Forestry Service, mostly reside in forest areas with inadequate access to technology and transportation (Jameaba, 2024; Adiwinata et al., 2022). Therefore, synchronizing perceptions between the community and the government regarding forest and land management is essential. Thus, it is necessary to analyze whether these mitigation activities will be successfully implemented by KPS by measuring the knowledge, attitudes, and behaviors within these KPS institutions (Ni et al., 2018).

This research aims to analyze whether the mitigation activities will be successfully implemented by KPS by assessing the knowledge, attitudes, and behaviors of KPS members in carrying out mitigation activities at the site level. Strengthening KPS institutions to perform better and providing references for decision-makers to plan activities to achieve mitigation targets that align with site conditions can serve as a basis for evaluating KPS in 13 (thirteen) other UPTD KPH units within the Forestry Service.

Methods

This research was conducted in the management area of UPTD KPH Region XI Kikim Pasemah, specifically in the Luang Kering KPS in Talang Tinggi Village and Muara Gelumpai in Jarai District, Lahat Regency, as well as the Sungai Geruntang KPS in Talang Padang Village, Pasemah Air Keruh District, Empat Lawang Regency. The research was carried out from July to September 2023.

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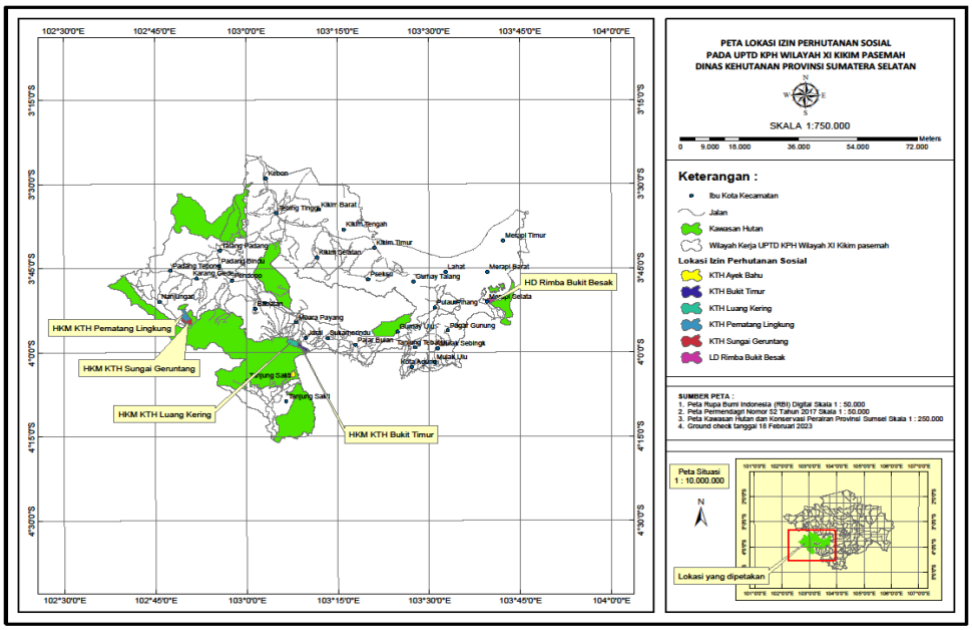

Figure 1. Research Location Map

Sample Determination

The sample selection was conducted using purposive sampling, which is a deliberate selection method. This method was employed to obtain more accurate information from reliable sources. Samples were chosen based on specific considerations; purposive sampling is defined as such (Masri et al., 2011). The determination of the sample size relates to the margin of error and several other factors that need to be considered, such as uniformity, cost, time, and available resources. The greater the diversity of characteristics or traits in each population element, the larger the sample needed. Gay & Diehl (1992) state that for descriptive research, the sample size should be 10% of the population; for correlational research, at least thirty population elements; for causal comparative research, thirty elements per group; and for experimental research, fifteen elements per group. According to Gay & Airasian (2007), in determining the sample size for descriptive research, 10–20% of the population is required (Rangkuti, 2019). Singarimbun & Effendi (1995) assert that the minimum number of respondents for a questionnaire trial should be 30, as the distribution of values will approximate a normal curve (https://dspace.uii.ac.id). Based on these expert opinions, the researcher collected data from 36 (thirty-six) respondents from both KPS.

Data Collection Method

The data collection methods used in this research included: 1) In-depth Interviews, 2) Observations conducted to observe and interpret the state of the research object. Observations were made to obtain data not acquired through interviews, and 3) Documentation, which serves as a record of past events.

Data Analysis Method

Data analysis in this research aims to address the objectives set out in the study. Qualitative data analysis is deductive in nature. According to Deshpande (1983), the deductive method begins with general principles, postulates, and specific paradigms and connects them with empirical data, serving as the basis for drawing conclusions, a process conducted before,

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during, and after the research. The analysis method used is the Miles model of data analysis (1992) (Anditasari, 2014), which states that activities in qualitative data analysis are conducted interactively and continuously until completion, leading to data saturation. Qualitative data analysis is an ongoing, repetitive, and continuous effort. Data reduction, data presentation, and conclusion drawing represent sequential success indicators as a series of interconnected analysis activities.

The objective of the research is to analyze the success of mitigation activities by assessing the knowledge, attitudes, and behaviors of KPS members. Prior to the overall data collection, the researcher conducted validity and reliability tests on the questionnaire with 30 samples. The testing was facilitated by IBM SPSS Statistics Version 26 software. The validity test applied the Pearson Product Moment formula. If the validity score of each response from the question list exceeds 0.3, the item is considered valid (Sugiyono, 2005). The questions regarding the knowledge aspect consist of 13 items (P1-P13), the attitude aspect contains 7 items (S1-S7), and the behavior aspect includes 11 items (PR1-PR11). The validity test results indicate that for the knowledge aspect, items 6 and 9 have a calculated r value < table value, rendering them invalid and eliminated from further calculations, as well as attitude statements 4 and 7.

The reliability test is used to measure the degree of trust and consistency of a measurement tool for assessing similar phenomena (Effendi and Tukiran, 2014). An instrument is considered reliable if it can be trusted to collect research data, yielding consistent results. The reliability test of the questionnaire employs the Cronbach's Alpha formula. The results of the reliability test show that the Cronbach's Alpha value exceeds the table r value, indicating the questions are reliable.

The collected data were then scored based on the responses in the questionnaire and processed and analyzed using Microsoft Excel 2016. The data obtained from the quantitative approach through the questionnaire were processed using MS Excel 2016 to view the initial data of respondents for each variable individually and were subsequently processed using IBM SPSS Statistics Version 26 software.

Results and Discussion

Ministry of Environment and Forestry Regulation No. 83 of 2016 on Social Forestry aims to address tenure issues and provide justice for local communities and customary law communities within or around forest areas to promote community welfare. Prior to the Ministry of Environment and Forestry Regulation (PermenLHK) No. 09 of 2021 on Social Forestry Management, the legality provided took the form of Community Forest Management Permits (IUPHKm). Since the enforcement of the new regulation, the legality form has been changed to Community Forest Management Approvals (Persetujuan Pengelolaan HKm). The purpose of providing management legality is to improve the welfare of local communities through optimal, fair, and sustainable utilization of forest resources while preserving the sustainability of forest and environmental functions.

The Operational Plan Document for Indonesia's FOLU Net Sink 2030 states that Social Forestry is an effort to increase forest cover as protection for forest areas while developing or enhancing community welfare through access to forest management. Community-based forest management access through Social Forestry follows the principles of forest protection, rehabilitation and reforestation, and community empowerment through agroforestry, agrosilvopasture, and agrosilvofishery systems.

Muttaqin et al. (2019) stated that community empowerment in natural resource management and education on the importance of conservation can help reduce deforestation. Increasing

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awareness of the ecological and economic benefits of protected forests should also be a focus (Tallis et al., 2008). Active participation of local communities in creating sustainable forest development will contribute to a productive and harmonious life in alignment with the environment.

Social Forestry Groups (KPS) granted management permits for 35 years are provided legal rights to manage their plantations without being regarded as encroachers. The KPS obtain rights and also assume obligations as outlined in the Community Forest Utilization Permit (IUPHKm) decree issued by the Ministry of Environment and Forestry. The main role of the KPS forest community institutions is to improve the welfare of their members while preserving forest sustainability. KPS are considered important to the success of forestry sector mitigation actions because KPS members are directly linked to forests, where government mitigation actions are implemented.

The discussion in this study relates to the knowledge, attitudes, and behavior of KPS members in accordance with their roles in climate change mitigation carried out by the South Sumatra Provincial Forestry Service, specifically at the Regional Technical Implementation Unit (UPTD) KPH Region XI Kikim Pasemah.

KPS Members' Knowledge

The researchers analyzed the extent of KPS members' knowledge of climate change, mitigation activities, and their implementation in Social Forestry activities using questionnaires and identified factors influencing members' knowledge by examining the characteristics of KPS members who were respondents in this study. Based on the questionnaire responses from KPS members, the results are presented in the tables below.

Table 1. Knowledge Assessment Results of Respondents According to Indicators

No	Indicator	Question Item Number	Mark (%)
1.	Climate Change (definition, causes, effects and impacts) question items	1,2,3,4	10.42
2.	Mitigation (definition, types of mitigation activities, infrastructure in mitigation activities)	5, 6	12.50
3.	Social Forestry	7,8,9,10,11	77.78

Source: Primary data processed by the researcher

The knowledge of KPS (Social Forestry Group) members regarding Social Forestry has the highest value at 77.78%, as Social Forestry is a flagship program of the Ministry of Environment and Forestry. The South Sumatra Provincial Forestry Service, in collaboration with BPSKL Region III Sumatra, relevant agencies, and private institutions, has aligned their work programs and activities to achieve Social Forestry implementation targets. Groups, group associations, or community cooperatives receive initial outreach on applying for Social Forestry Management in accordance with the Ministry of Environment and Forestry Regulation No. 9 of 2021. The government and the Social Forestry Acceleration Working Group (POKJA PPS) facilitate Social Forestry application submissions, including conducting outreach on Social Forestry management. After a group, association of groups, or community cooperative receives approval for Social Forestry management, they are then provided with facilitation in the form of outreach and post-approval support for preparing Social Forestry work plans. Outreach is crucial for the sustainability of the process, consistent with Goslin's view in

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Badruddin & Meysyanti (2022) that socialization is a learning process through which a person gains knowledge, skills, values, and norms to participate as a member of their community group (Lindriati et al., 2017).

KPS members' knowledge of climate change (10.42%) and forestry sector mitigation (12.50%) is lower compared to their knowledge of Social Forestry activities, due to the absence of outreach activities specifically covering these topics. Once they obtain Social Forestry Management Approval from the Minister of Environment and Forestry (LHK), KPS focuses on managing their areas according to the Social Forestry Management Approval Decree they receive.

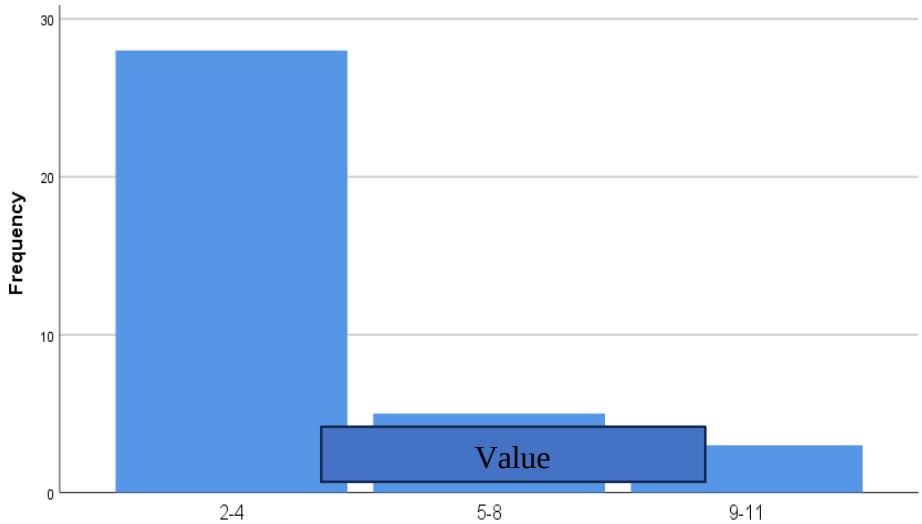
KPS manages their areas with a sustainability principle, maintaining forest conservation while also improving their welfare. These sustainable management activities support forestry sector mitigation. Outreach activities on FOLU Net Sink implementation or coordination meetings held by the South Sumatra Provincial Government only involve stakeholders actively participating in the Indonesia FOLU Net Sink 2030 program, including central and local governments, along with NGOs and private institutions.

The total score calculation results of the 36 respondents are presented in Table 2 and Graph 1 below:

Table 2. Frequency of Respondents' Overall Knowledge Scores

Category	Respondent Value Interval	Frequency
Low	2 — 4	28
Currently	5-8	5
Tall	9-11	3

Source: Primary data processed by researchers



Graph 1. Respondents' Knowledge Level

The graph and table above show that 3 (three) respondents have high knowledge (8.3%), 5 (five) respondents have medium knowledge (13.9%), and 28 (twenty-eight) respondents have low knowledge (77.8%). There are 2 (two) factors that influence knowledge: internal and external. Internal factors include education, occupation, and age, while external factors cover environment and socio-cultural aspects (Bakhtiar, 2011).

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Internal Factors

The internal factors that influence a person's knowledge are education, occupation, and age. Before explaining the effects of these factors on knowledge levels, let's first look at the characteristics of the respondents. Respondent characteristics based on education and age are presented in Table 3 below:

Table 3. Respondent Characteristics by Education

No.	Respondents	Education		
		Junior High School (person/%)	**High School (person/%)**	**S1 (person/%)**
1.	KPS Dry Luang	-	29 (96.7%)	1 (0.03 %)
2.	KPS Geruntang River	-	6 (100%)	-
Amount		**-**	**35 (97.2%)**	**1 (2.8%)**

Source: Primary data processed by the researcher

The data in Table 3 above shows that most respondents have a high school education, with only 1 (one) respondent holding a bachelor's degree. The respondent characteristics based on age are shown in Table 4 below:

Table 4. Respondent Characteristics by Age

No.	Respondents	Age		
		19-44 (people/percent)	**45-59 (people/percent)**	**60< (people/percent)**
1.	KPS Dry Luang	8 (26.7%)	16 (53.3%)	6 (20%)
2.	KPS Geruntang River	3 (50%)	2 (33.3%)	1 (16.7%)
Amount		**11 (30.6%)**	**18 (50%)**	**7 (19.4%)**

Source: Primary data processed by the researcher

The data in Table 4 shows that most respondents are aged 45–59 years (50%), followed by 19–44 years (30.6%) and 60 years or older (19.4%).

These characteristics influence a person's knowledge, as explained below:

Education Level

Education level affects how well information is absorbed and applied in land management. Education provides access to new knowledge; thus, the higher one's education, the more comprehensive their perspective on the environment compared to those with lower education levels. Consistent with the study by Hoidn & Kärkkäinen (2014), education provides intellectual and creative development, aiding in problem-solving and decision-making. Higher education also facilitates receiving information, resulting in greater experience (Suwaryo & Yuwono, 2017). Knowledge stimulates action, as a person cannot take action without understanding its impact, and their actions may increase when they recognize benefits. Therefore, environmental knowledge should be imparted early to address environmental issues. Mei et al. (2016) stated that declining environmental quality is due to a lack of environmental awareness and education, making behavior change difficult. Similarly, Hamzah (2013) mentioned that education shapes a person's mindset to be environmentally aware. Paton &

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Johnston (2001) said that education is a strategic step to prevent natural disasters by instilling character, values, knowledge, and skills (Daud et al., 2020).

Respondent 1 has the highest knowledge score and is the only respondent with a bachelor's degree. Most KPS members are high school graduates. In an interview, Respondent 1 explained that his high knowledge was gained from participation in various seminars, training sessions, and technical guidance provided by local and central governments, aligned with his role as the KPS Chair, representing KPS members in activities related to KPS. The interview confirms this, as stated:

> *"Those who attend activities held by BPSKL or the Forestry Service are group representatives, usually the Group Leader only, per the invitation given" (Informant 1, 2023).*

Age

Age categories in terms of health and psychology emphasize physical and mental conditions from a psychological perspective, categorizes people aged 40–60 as middle-aged. Grosse et al. (2019) stated that this age range is considered productive (15–60 years) from an economic perspective.

Most respondents are between 45 and 59 (50%), a pre-elderly, middle-aged, and still productive age group. Pre-elderly individuals prepare themselves for a healthy, active, and productive old age. Productive age is marked by the ability to perform daily activities effectively and efficiently, supported by good physical health (kemkes.go.id). People in this age range are considered capable of producing goods and services in the production process. Productive age is when a person can still work and produce (kkbi.web.id, 2024). Younger farmers are more capable of managing their farming activities. KPS members are productive in working but less attentive to the importance of group gatherings.

Occupation

The respondents are members of KPS, meaning their primary occupation is as farmers, specifically coffee farmers.

II. External Factors

External factors that influence a person's knowledge are environment and socio-cultural aspects. The characteristics of respondents based on their place of residence are shown in Table 5 below.

Table 5. Respondent Characteristics by Place of Residence

No.	Respondents	Residence	
		In One District (people/percent)	**Outside District (people/percent))**
1.	KPS Dry Luang	11 (36.7%)	19 (63.3%)
2.	KPS Geruntang River	6 (100%)	-
Amount		**17 (47.2%)**	**19 (52.8)**

Source: Primary data processed by the researcher

Table 5 above shows that most respondents reside outside the district (52.8%). Based on their KPS, many members of KPS Luang Kering live outside the district, while all members of KPS Sungai Geruntang are local residents.

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KPS Luang Kering is located in the administrative areas of Talang Tinggi Village and Muara Gelumpai Village, Muara Payang District, Lahat Regency. Accessibility to the Luang Kering Community Forest is via a 6-kilometer road from the District Capital of Muara Payang, with 3 kilometers in good condition and 3 kilometers in moderate condition.

KPS Sungai Geruntang is located in Pasemah Air Keruh District, Empat Lawang Regency. Talang Padang Village, the farthest from the district capital, is approximately eleven kilometers away and about eighty-six kilometers from the regency capital. The road is paved but has many potholes, which slow travel times.

Lawrence & Low (1990) states that socio-cultural environments encompass interpersonal relationships, including social patterns and norms within a spatial environment, determined by the prevailing social relations (including human behavior within). The socio-cultural environment has evolved alongside humanity, emphasizing human aspects within a cultural framework. Socio-cultural environments change with improved human adaptation to surroundings (Deliyanto, 2014). Lahat Regency is one of the seventeen regencies/cities in South Sumatra Province. Its geographical boundaries are defined under Law No. 28 of 1959 on the Formation of Second-Level Regions and City Governments. Empat Lawang Regency was separated from Lahat Regency and established on April 20, 2007 (empatlawangkab.go.id). Based on their ID cards, most KPS members are residents of Lahat and Empat Lawang Regencies. The main ethnic groups are Lematang, Kikim, Pasemah, and Lintang, historically known as the Lekipali group. The largest groups of newcomers are Javanese and Semendo from Muara Enim Regency.

The area's topography consists of mountains and hills. The Bukit Barisan mountain range in the west and south includes Mount Dempo, its highest peak, reaching 3,159 meters above sea level. In this fertile land, most people rely on farming. Besides rice, they grow secondary crops and vegetables. Common crops include coffee, rubber, cloves, candlenut, coconut, and cinnamon. Coffee farming has been a livelihood for people in Lahat and Empat Lawang Regencies for generations. They manage coffee farms year-round, living on the farms during the coffee season from May to August, while in other months, they visit occasionally for maintenance. This cycle affects member participation in KPS, making it challenging to gather members for training, planned KPS activities, and mitigation efforts.

These internal and external factors have influenced the knowledge possessed by KPS members. Steps to enhance members' knowledge include outreach, capacity-building (training, seminars, workshops, etc.), and ongoing support.

KPS Members' Attitudes

Attitude is a positive or negative assessment of an object influenced by factors such as personal experience, culture, and significant individuals in one's life (Azwar, 2022). Below are the results of an analysis of KPS members' attitudes. The measurement of KPS members' attitudes is shown in Table 6 below:

Table 6. Frequency of Overall Respondent Attitude Scores

Answer	Frequency For Each Question				
	S1	S2	S3	S4	S5
Strongly Agree (SS)	16	1	5	6	5
Agree (S)	20	24	31	30	21
Disagree (TS)	-	11	-	-	10
Strongly Disagree (STS)	-	-	-	-	-

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Amount	**36**	**36**	**36**	**36**	**36**

Source: Primary data processed by the researcher

Note:

S1 = Attitude 1, S2 = Attitude 2, S3 = Attitude 3, S4 = Attitude 4, S5 = Attitude 5

Table 6 above shows that each question is dominated by responses of Strongly Agree (SS) and Agree (S).

Table 7. Likert Scale Values of Respondent Attitudes

No.	Indicator	Question Item Number	Mark (%)	Interpretation of Scores
1.	The cause of climate change is due to human activities that damage the environment.	1	86.11	Strongly agree
		2	68.06	Agree
		3	78.47	Strongly agree
2.	Activities that support mitigation actions	4	79.17	Strongly agree
3.	Imposing warnings, sanctions or punishments on environmental damage	5	71.53	Agree

Source: Primary data processed by the researcher

The questionnaire on attitude statements proves that most respondents agree that climate change is caused by human activities, so mitigation activities are one solution to mitigate the impact of climate change. They also agree that environmental violators should receive sanctions or punishment.

One way to interpret individual scores on the Likert scale is to compare them with the mean score of the group where the respondents belong.

Table 8. T-Score Distribution

Question Items	Mean/average value	T-Score
S1	3.44	61.11
S2	2.72	74.95
S3	3.14	74.50
S4	3.17	71.96
S5	2.86	67.84

Source: Primary data processed by the researcher

The calculations show that the T-Score > 50, which indicates that respondents have a positive attitude toward mitigation activities in addressing climate change.

Azwar (2022) explains that personal experience, culture, and significant people in one's life influence one’s attitude. The KPS leader is chosen and becomes a role model for the members. The KPS leader has greater abilities in terms of education, experience, and social interaction, so members agree with the decisions he makes, and members' attitudes are strongly influenced by the leader’s attitude. According to interview results, respondents support the implementation of forestry sector mitigation activities, such as reforestation, forest patrols to prevent forest fires, encroachment, and illegal logging. This is supported by the statement of Respondent 3.

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> *"I agree with reforestation activities because it's been proven: the more forests disappear, the more landslides and floods occur. Large trees positively impact life. Forest patrol activities must be carried out regularly because encroachment threats are always present, and perpetrators should receive sanctions or punishment to create a deterrent effect" (Respondent 3, 2023).*

Eleven respondents disagreed with the statement that environmental damage is solely caused by human activity; one of them was Respondent 4.

> *"Earthquakes and volcanic eruptions also cause environmental damage with significant impacts, Ma'am" (Respondent 4, 2023).*

They are correct that natural factors also contribute to environmental damage. Indonesia's position on three tectonic plates—the Eurasian Plate, Indo-Australian Plate, and Pacific Plate—which converge and collide, results in dynamic geological activities that can lead to natural disasters such as earthquakes, tsunamis, and landslides. However, human factors, such as unwise land use changes, deforestation, and housing construction on steep topography, also play a major role in landslides. Landslides are related to geological triggers, land use, human activity, and earthquakes. Landslides involve the movement of slope material, such as soil, mud, regolith, or bedrock, due to gravitational forces. Events like volcanic eruptions, earthquakes, and tsunamis are natural phenomena. They become disasters when there are casualties.

The multifaceted crises caused by extractive industries, ambitious government infrastructure projects, and false climate solutions in energy transitions are proof of failure in natural resource management. In a worsening climate crisis, the intensity of ecological disasters will inevitably increase. Ecological disasters accumulate from ecological crises caused by injustice and failed natural management systems, leading to a collapse in environmental carrying capacity and ecosystem destruction (Suhadi, 2023). Therefore, it can be concluded that this damage is largely due to human intervention.

Interviews about law enforcement for environmental violators show that most respondents agree with imposing sanctions or punishments. However, ten respondents disagreed, arguing that controlled, responsible land clearing by burning on a small scale should not be sanctioned. Hamzah (2005) notes that environmental law enforcement is complex, with a wide range of violations, from minor offenses, such as household waste disposal, to dangerous offenses like hazardous and toxic waste and atomic radiation dumping. Environmental law is enforced through various instruments administrative, civil, or criminal law or all three simultaneously (scholar.unand.ac.id). Resolving environmental disputes through administrative law aims to stop or restore actions that violate the law or do not meet standards (before the violation occurred). Administrative sanctions focus on the act, while criminal sanctions focus on the individual (offender). Furthermore, sanctions are not only directed at the offender but also at potential violators.

Environmental law also recognizes other administrative sanctions, such as company closure, equipment bans, coercive fines (dwangsom), and permit revocation. Environmental law enforcement can also follow the civil route, although it is less favored in Indonesia due to lengthy court processes. Most civil cases are appealed to the highest court for cassation due to dissatisfaction with the judgment. There is even a tendency to deliberately delay proceedings by always using legal recourse, even if baseless, up to review stages. Even after a decision is made, enforcement can still be challenging (Hamzah, 2005 in scholar.unand.ac.id).

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Administrative environmental law enforcement includes supervision and sanctions, but implementation remains challenging. Criminal law enforcement focuses on investigating and prosecuting environmental pollution, requiring solid evidence. Civil law enforcement addresses environmental disputes through civil law principles of strict liability. However, environmental law enforcement in Indonesia still faces obstacles, including the complexity of prosecution and court ruling enforcement (Kurniawan et al., 2023). Administrative sanctions for KPS that do not fulfill their obligations range from serious sanctions, such as revoking Social Forestry Management permits, to lighter sanctions, such as warnings and excluding the group from other activities.

KPS Member Behavior

The behavior adoption process, derived from knowledge, involves several stages before an individual adopts a new behavior: awareness, interest, and evaluation. Most KPS members still show a low level of involvement (92%) in climate change mitigation activities through KPS institutions, including activity planning, implementation, monitoring, and evaluation (Rogersi in Darsini et al., 2019). Behavior is influenced by interrelated nature and nurture factors. The influence of nature comes from physiology, while nurture stems from experience. Behavior based on nature involves physiological aspects, such as self-awareness, memory, or problematic emotions. In contrast, nurture-based behavior comes from experience, including learning outcomes. Below are the results of the KPS member behavior assessment.

Table 9. KPS Member Behavior Assessment Results Using Gutman Scale by Question Item

No.	Indicator	Question Item Number	Interpretation of Value (%)	Category
1.	Involvement in KPS activities (planning, implementation, monitoring and evaluation)	1	25	KB
		2	33.33	KB
		3	2.78	KB
		4	22.22	KB
		5	8.33	KB
		6	16.67	KB
		7	94.44	B
		8	5.56	KB
		9	5.56	KB
		10	2.78	KB
		11	2.78	KB
		12	2.78	KB
2.	Providing warnings, sanctions or punishments for the implementation of the role of KPS members in mitigation activities which are the obligation or responsibility of KPS.	13	94.44	B

Information:

B = Good

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KB = Poor

The behavior of most respondents toward the implementation of mitigation activities by KPS is considered poor. Respondents' behavior categorized as good is visible in the responses to question item 7, concerning the evaluation of mitigation activities conducted by KPS, and item 13, about issuing sanctions or warnings to group members failing in their obligations related to mitigation activities. Notably, the highest scores belong to three KPS board members. The behavior of KPS board members differs from that of regular members, as board members are responsible for tasks involving administration, monitoring, evaluation, reporting, and conducting routine meetings. Regular KPS members only participate in physical mitigation actions, while administrative, monitoring, evaluation, and reporting duties are fully delegated to the KPS Board. According to Respondent 2, a board member:

> *"Monitoring, evaluating, and reporting on RHL activities, fire prevention, and forest encroachment are conducted quarterly until the activities are deemed completed, although activity outcomes are not yet optimal" (Respondent 2, 2023).*

Currently, members' behavior does not yet reflect a strong commitment to the success of mitigation activities, despite their supportive attitudes toward mitigation efforts. Based on role division theory by Soekanto (2002), it appears that KPS members currently perform a participatory role in climate change mitigation activities, with only the board actively involved. Changing member behavior must be a priority since climate change mitigation activities are a long-term program conducted continuously to preserve the environment. Proper individual behavior, following established norms and rules, effectively and efficiently executed in every activity, is the key to success. Continuous socialization of Social Forestry activities should be conducted for all farmers working in state forest areas, whether or not they are members of the KTH, as they are not fully aware of the importance of being part of a group.

Notoatmodjo (2020) states that before adopting a new behavior, an individual goes through a sequential process, including awareness, interest, evaluation, trial, and adaptation. Analysis of KPS members' attitudes shows positive results, but their behavior remains poor. Greenwald (1989), as well as Ajzen et al. (2018), are among the researchers who discovered the weak link between a person's attitude and behavior. Ajzen et al. (2018 noted that high school students in Lampung Province had a positive attitude towards the teaching profession but were uninterested in becoming teachers (Azwar, 2022).

Paavola & Hakkarainen (2005) argued that every individual possesses varying levels of knowledge, beginning from knowing, understanding, applying, analyzing, synthesizing, and evaluating. Higher knowledge levels correlate with better judgment in terms of good and bad actions, providing a foundation for behavior (Budiman, 2013). Consistent with the research findings, respondents' knowledge about climate change and mitigation remains low, which affects their behavior toward mitigation implementation.

Currently, the Forestry Service supervises KPS, whose members are heads of households, with the expectation that socialization, capacity building, and assistance provided to these heads of households will enable them to relay information and knowledge to other family members, embedding an environmentally conscious attitude and behavior.

Conclusion

The conclusion derived from this study emphasizes the need to enhance KPS members' knowledge regarding mitigation actions in the forestry sector to contribute to climate change efforts. Although mitigation activities have been implemented with satisfactory participation,

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each member's active role needs further improvement. Behavioral change among members should be a priority, as climate change mitigation is a long-term program that must be continuously implemented to preserve our environment. Individual behaviors that align with applicable norms and rules, executed effectively and efficiently in each activity, are the keys to success. KPS serves as a partner to the South Sumatra Forestry Service, acting as supervisors or guardians of the forest areas under their management to prevent deforestation, degradation, and to enhance carbon stocks through forest and land rehabilitation. The Social Forestry Group's commitment to sustainable management of their area in line with environmental conservation is imperative. Furthermore, KPS rights must be granted or facilitated by relevant agencies to ensure that KPS targets in supporting FOLU Net Sink are achieved. KPS as an institution benefits individuals and groups as a forum for sharing experiences, skills, and improving welfare through joint ventures.

The recommendations for the success of future mitigation actions include institutional strengthening of KPS through education, training, socialization, exhibitions, etc., which should be conducted routinely for all members to enhance their knowledge and skills, ensuring that KPS targets in planning are optimally achieved. Implementing a reward and punishment system for KPS members based on target achievements is essential. Continuous assistance, monitoring, and evaluation by KPS, the Forestry Service, and related agencies should be conducted together to find joint solutions for performance improvement. KPS should be provided with support in terms of facilities, infrastructure, and market information to help them gradually achieve independence. Effective coordination, synchronization, and collaboration between KPS, relevant forestry agencies, institutions, and organizations are crucial for implementing mitigation actions at the ground level. Further research is also needed to evaluate the success of forestry sector mitigation efforts through land cover analysis and carbon calculations for all Social Forestry management areas, particularly in South Sumatra Province.

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