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# CHALLENGES AND EFFORTS TO CONTROL DEFORESTATION IN ACEH'S BORDER AREAS: A STUDY OF SUBULUSSALAM CITY

**Shabariah[1], Muryali[2], Risna Dewi[3], Cut Sukmawati[4], Lisa Iryani[5]**
Public Administration Study Program, Faculty of Social and Political Sciences, Universitas Malikussaleh, Lhokseumawe, Indonesia.
Email:shabariahr@gmail.com,muryali.adp@unimal.ac.id, risna.dewi@unimal.ac.id,skripsitesiscutsukmawati@gmail.com,lisa.iryani@unimal.ac.id,

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**Abstract**

This research is entitled Deforestation Control: A Study of Forest Areas in Subulussalam City, Aceh. The main problem in this research is the increasing deforestation that has an impact on ecosystem damage, reduced biodiversity, and threats to the sustainability of community life. Subulussalam City was chosen as the research location because it is the area with the second highest deforestation rate in Aceh, especially in the Leuser Ecosystem (KEL) area. Theoretically, this research is based on the perspective of public administration, public management, and command and control theory which emphasizes the importance of regulation, supervision, and law enforcement in natural resource management. The research method uses a descriptive qualitative approach with data collection techniques in the form of interviews, observation, and documentation of informants from the DLHK, NGOs, business actors, and local communities. The results of the study indicate that the mechanism for controlling deforestation in Subulussalam City is carried out through the prohibition of illegal logging, restrictions on logging permits, routine patrols, and the use of technology such as satellite imagery and smart patrols. Obstacles found include limited human resources, infrastructure, weak coordination between agencies, and minimal community participation. Furthermore, economic pressures on communities and the practice of land conversion to plantations have exacerbated the rate of deforestation. The conclusion of this study is that deforestation control in Subulussalam City is underway, but its effectiveness remains limited. Institutional strengthening, increased technology-based monitoring, consistent law enforcement, and community empowerment are needed to maintain sustainable forest conservation.

**Keywords:** ***Control, Deforestation, Forest Deforestation, Subulussalam, Forest Management.***

## INTRODUCTION

Control in the context of management refers to a series of actions, processes, and mechanisms implemented by management to ensure that organizational activities are in accordance with established plans, objectives, and standards. Therefore, control is an integral part of the management function that ensures that the organization achieves its goals and remains responsive to change. By combining monitoring, correction, and strategic direction, control forms the basis for organizational success (Fauzan, 2024:40). As one of the countries with the largest tropical rainforests in the world, Indonesia plays a vital role in maintaining ecosystem balance. Indonesia's vast tropical rainforests are the reason why this country is nicknamed the lungs of the world. Tropical rainforests are a natural treasure possessed by Indonesia, with a variety of biodiversity within them, both flora and fauna. This diversity in Indonesia includes 10% of the world's plant species, 12% of mammals, 16% of reptiles and amphibians, and 17% of birds. Thus, both flora and fauna in Indonesian forests play a vital role in maintaining ecosystem balance, which supports environmental sustainability and the survival of all living things (Durahman, 2024:2). Deforestation violates the principles and legal rules that apply to environmental protection. From a legal perspective, this situation highlights the importance of effective regulation and law enforcement in deforestation control efforts. In Indonesia, various regulations governing deforestation exist. These regulations aim to protect forests from various types of damage and manage natural resources for sustainable livelihoods. Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 18 of 2022 concerning the Organization and Work Procedures of the Forest Area and

Environmental Management Agency provides the legal basis and procedures for implementing REDD+ (Reducing Emissions from Deforestation and Forest Degradation), which aims to reduce emissions from deforestation and forest degradation, as well as encourage conservation, sustainable forest management, and increase forest carbon stocks. This regulation is highly relevant for implementing in controlling deforestation in the forest area of Subulussalam City, Aceh, which faces the threat of forest damage due to land conversion and illegal logging. Meanwhile, Aceh implements the protection of Forest Areas in Aceh Qanun Number 7 of 2016 concerning Forestry, which is a special regional regulation governing forestry management in Aceh Province. This Qanun was created as an implementation of Aceh's special authority within the framework of Law Number 11 of 2006 concerning the Government of Aceh (UUPA), which grants Aceh broader autonomy, including in the field of natural resource management. In Aceh, especially the Subulussalam area, deforestation has become a critical problem that threatens biodiversity, ecosystems, and the lives of forest-dependent communities. Subulussalam City itself has the second highest deforestation rate in Aceh with an affected area reaching 911 hectares. Data shows that approximately 30% of the forest in the area has been damaged by illegal activities such as illegal logging and land clearing for oil palm plantations, threatening endangered wildlife, including the Sumatran tiger (Panthera tigris sumatrae) (BPS Aceh, 2021). Deforestation in Subulussalam City, Aceh, has become a serious concern due to its impact on the environment and communities. Throughout 2024, Subulussalam City lost 1,040 hectares of forest cover, part of an increasing trend of deforestation in Aceh Province. The Leuser Ecosystem (KEL), which has high ecological value, is also under pressure from ongoing logging activities. This forest cover loss contributes to landscape changes and increases the risk of natural disasters such as floods and landslides (linear.co.id). The following are areas in Subulussalam City that have lost forest to non-forested areas:

**Table 1**
**Data on areas affected by deforestation of forest areas in Subulussalam City**

| No | Regional Area | Area |
|---|---|---|
| 1. | Sultan Daulat District | 3,763 Ha |
| 2. | Simpang Kiri District | 1,174 Ha |
| 3. | Rundeng District | 859 Ha |
| 4. | Penanggalan District | 649 Ha |
| 5. | Longkip District | 601 Ha |

*Source: Subussalam Forestry Service, Aceh 2024*

One of the main factors in controlling deforestation is law enforcement against illegal activities. For example, reports of illegal oil palm plantations being cleared by PT. Sawit Panen continue to demonstrate the need for decisive action from the government and law enforcement to stop this environmentally damaging practice. Cleared forest areas are converted into plantations with low water absorption capacity and located in less strategic locations (Siburian & Nurhidayah, 2019:2). Controlling deforestation has several important, interrelated goals. First and foremost, it aims to protect the invaluable biodiversity found in the world's forests. Tropical and other forests are home to a diverse range of plant and animal species, including many that are threatened with extinction. By controlling deforestation, we strive to keep these natural habitats intact, allowing complex ecosystems to continue to thrive and thrive.

Source: BPS Aceh Province, 2025
**Figure 1.1 Protected Forest Area in Sultan Daulat, Subulussalam City in 2024**

Aceh is part of the Leuser Ecosystem, a vast, unified region containing diverse flora and fauna. As a region with exceptional habitat balance, the Leuser Ecosystem can sustainably support biological resources and should not be separated. The challenge faced is limited data and information on current forest conditions. According to the Ministry of Environment and Forestry (LHK) Report (2020), accurate and detailed data on land cover and deforestation dynamics are crucial for effective planning and management control. Lack of transparency and data accessibility can hamper evidence-based decision-making in Subulussalam. Inter-agency coordination is also a crucial factor in controlling deforestation. The Aceh Environment and Forestry Agency (DLHK) has strived to improve the effectiveness of Forest Management Units (KPH) to better manage forest areas. With strong coordination between local governments, non-governmental organizations, and communities, preventative measures can be implemented more effectively (Hardjanti, 2024:305:306).

Addressing this issue requires collaboration between local governments, local communities, and other stakeholders. REDD+ programs already implemented in several regions through international collaboration could serve as a model for implementation in Subulussalam. According to a 2018 report from the Forestry Research and Development Agency, REDD+ has demonstrated progress in reducing emissions from deforestation and forest degradation through economic incentives and local conservation efforts (Wong et al., 2022:3). Although deforestation rates in Aceh have decreased compared to the previous year, the negative impacts are still felt. Data shows that Subulussalam City lost 911 hectares of forest cover in 2023. This deforestation not only threatens biodiversity but also increases the potential for hydrometeorological disasters. Factors such as topography, extreme weather, and forest loss are the main causes of increased flooding in the region. Indonesia, as the country with the largest tropical rainforest area in the world, plays a strategic role in maintaining the balance of the global ecosystem. Forests in Indonesia, including in Subulussalam City, Aceh, not only provide habitat for high biodiversity but also serve as a buffer for local communities and support environmental stability. However, in recent decades, the rate of deforestation in various regions, particularly in Subulussalam, has shown a worrying trend. This phenomenon not only results in the loss of forest cover but also causes various environmental problems such as an increased risk of flooding, landslides, and damage to river ecosystems that are a source of livelihood for local communities.

Deforestation in Subulussalam City is driven by various factors, including land clearing for oil palm plantations, both by companies and communities. This activity is often carried out without proper permits, exacerbating environmental damage and creating conflicts of interest between businesses, communities, and the government. Furthermore, weak control and law enforcement are major obstacles to deforestation control efforts. Law enforcement officials and relevant agencies often face challenges in prosecuting violations, particularly when the encroached land is privately owned or its legality is unclear. Other significant obstacles to controlling deforestation in Subulussalam include a lack of coordination between government agencies, overlapping authorities, and minimal community participation in forest conservation efforts. Economic pressures faced by communities, such as the need for agricultural and plantation land, are often the primary reason for new land clearing. Furthermore, limited data and information on forest conditions and deforestation activities complicates evidence-based planning and decision-making. The high economic value of plantation and timber products also provides an incentive for communities and companies to continue clearing forests, even though this contradicts principles of environmental sustainability. Efforts to control deforestation have been implemented through various conservation policies and programs. The government and environmental organizations are striving to implement mitigation measures, including law enforcement against perpetrators of forest destruction and improving the effectiveness of forest management (waspadaaceh.com). However, challenges remain, particularly in ensuring regulatory compliance and encouraging community participation in forest preservation.

## LITERATURE REVIEW

### Definition of Public Administration

Administration, a word we often hear, has even become a common phrase in everyday life. It's not just in government agencies, but also in everyday life (Hendrayady et al., 2024). Meanwhile, public administration is defined as the science and art carried out by a group of people within a public organization rationally working together to achieve public goals. A broader definition of public administration is the process of cooperation carried out by a group of people within a public organization rationally planning, organizing, mobilizing, and controlling people and infrastructure to achieve public goals, namely providing the best service to the community (Ummah, 2019).

### Public Management

Public management is the main factor in public administration to achieve predetermined goals with existing facilities and infrastructure, including the organization and available financial and human resources (Ramto, 1997:14)

in Waluyo (2007:119). Thus, government management is nothing more than an effort factor in an organization. These efforts are realized in various government activities that cover various aspects of the lives and livelihoods of citizens and society (Kristiadi, 1994) in Waluyo (2007:119).

## Control

Controlling deforestation or deforestation is part of natural resource conservation efforts aimed at maintaining ecosystem balance and preventing environmental degradation. In Environmental Governance theory, the management and control of natural resources, including forests, must involve various actors such as the government, civil society, and the private sector through effective policies, regulations, and control mechanisms. According to Robbins and Coulter, Controlling includes monitoring activities to ensure that everyone achieves what has been planned and correcting existing deviations (Rohman, 2017:148). According to Arifin & Hadi W., controlling (supervision), also known as control, is a management function related to the procedure for measuring work results against predetermined goals. In other words, this function aims to ensure that the discovery and implementation of activities (including the methods and equipment used) in the field are in accordance with the plan (Taufiqurokhman, 2018:9).

## Understanding Deforestation

Deforestation is a condition where forest area decreases due to land conversion for infrastructure, settlements, agriculture, mining, and plantations. The conversion of forest land to non-forest land contributes to global warming due to the frequent occurrence of forest fires.related to illegal logging or logging which threatens all living creatures which is generally caused by forest fires which cause global warming (Nakita & Najicha, 2022).

## METHOD

The research location is where the researcher conducted the research on the object of study. This location is precisely in Subulussalam City, Aceh Province. The reason the researcher was interested in choosing this research location is because Subulussalam City, Aceh as the research location is based on the high rate of deforestation due to land clearing for agriculture, plantations, and infrastructure. Significant changes in forest cover indicate the need for in-depth studies on the patterns and effectiveness of deforestation control. This area also has a strategic position within the Leuser Ecosystem Area (KEL), which is an important tropical rainforest ecosystem. Deforestation in Subulussalam City not only has local impacts but also affects the balance of the broader ecosystem. In addition, the availability of data and support from various parties make Subulussalam City an ideal location for this research. By considering ecological, social, and policy aspects, this research is expected to be able to formulate a more effective deforestation control strategy.

This research seeks to find out. Therefore, the researcher uses a qualitative approach as stated by Sugiyono (2021:205). By using this method, it is hoped that the research conducted will be right on target. Qualitative research is research aimed at describing and analyzing phenomena, events, social activities, attitudes, beliefs, perceptions, and thoughts of people individually or in groups. The data obtained is then analyzed to obtain answers to emerging problems (Samsu, 2021). According to Sugiyono (2019:216-218), in qualitative research, the source of information is a source or informant related to the problem being studied and can provide information according to the situation and conditions of the research background. In Sugiyono's book (2019:220) entitled Qualitative, Quantitative, and Research and Development Research Methods, it is stated that data sources are all information that can provide data as a basis for this research. Therefore, this study describes two types of data used:

1. Primary Data
   Primary data is the data source that directly provides data for data collection. Primary data in research are sources considered competent in their field, with the goal of obtaining valid data from the source. Primary data in this study was obtained directly from the research location, with individuals encountered during implementation activities. Primary data sources were obtained through interviews with research subjects and direct observation in the field.
2. Secondary Data
   Secondary data is a data source that does not directly provide data to the data collector, for example through other people or through documents. Secondary data in the research was also obtained from official institutional websites that can serve as a reference based on this research study, in addition to references from books, journals, e-books, articles and information from internet journals and applicable laws and regulations regarding Deforestation.

## RESULTS AND DISCUSSION

### Deforestation Control Mechanism in Subulussalam City

Wrong One crucial sector in natural resource management in Indonesia, including Aceh, is the forestry sector. For a long time, forestry management was carried out through the granting of various permits to private parties and companies. At the same time, communities living in and around forest areas also depended on forest resources and the land on which they grew. However, the utilization of forests and forest areas gave rise to contestation between communities and private parties and companies. This contestation stemmed from unequal access, which ultimately led to tenure conflicts. This conflict stemmed, in part, from the licensing process, which was more easily accessed and exploited by private parties and companies.

Control of deforestation in Subulussalam City follows the mechanisms directed by the local government and the Environmental Service. The Aceh Environment and Forestry Service (DLHK) operates at the provincial and city levels. Government Regulation Number 23 of 2021 concerning Forestry Implementation stipulates that forests are divided into Conservation Forests, Protected Forests, and Production Forests based on their function. Therefore, in general, forest utilization access can be granted to individuals, cooperatives, state-owned enterprises (BUMN), and Indonesian privately-owned enterprises (BUMS), and can be granted in the form of permits to conduct area utilization activities, utilize environmental services, utilize timber and non-timber forest products, and collect timber and non-timber forest products. The deforestation control mechanism in Subulussalam City implemented by the Environment and Forestry Service (DLHK) includes the following steps:

### Prohibition of Illegal Logging

The Subulussalam City Environment and Forestry Service is a regional government authorized to carry out control based on Law Number 32 of 2009 concerning Environmental Protection and Management and Government Regulation Number 12 of 2017 concerning Regional Government Guidance and Supervision. Supervision of the Subulussalam City Environment and Forestry Service is carried out to carry out its duties and functions as a regional government in Subulussalam City. This is in accordance with Subulussalam Mayor Regulation Number 15 of 2021 concerning the Organization and Work Procedures of the Ministry of Environment and Forestry, it is necessary to organize the organization and work procedures of the Forest Area Stabilization Center. Periodic control and monitoring carried out by the DLHK routinely, including direct field inspections, document examinations, interviews, and data collection as a basis for law enforcement and prevention of environmental damage. Control is carried out at least once every six months in accordance with applicable protocols and SOPs. Based on an interview conducted by the researcher with Mr. Dedek Hafi Ismanto S.Hut., M.Si as Sub-Coordinator of the Forest Inventory and Planning Section, he said that:

"We implement technology-based control mechanisms such as satellite monitoring systems, smart patrols, and early warning systems to detect illegal forest activities. Furthermore, coordination with security forces and community partners is crucial in conducting routine patrols to prevent illegal logging." (Interview, May 7, 2025). He then added that: "The forest logging monitoring mechanism in Subulussalam City is carried out by the Environment and Forestry Service (DLHK) routinely every six months based on SOPs. Field monitoring is carried out by DLHK officials who directly inspect the location, permit documents, facilities, and conduct interviews and take waste samples. The main obstacle is limited human resources and supporting facilities. Monitoring aims to maintain environmental sustainability by controlling logging activities to comply with applicable regulations." (Interview, May 7, 2025).

Based on the interview results above, it can be analyzed that forest logging control in Subulussalam City adopts advanced technology-based mechanisms such as satellite monitoring systems, smart patrols, and early warning systems to detect illegal activities. In addition to the use of technology, field monitoring is carried out routinely every six months by the Environment and Forestry Service (DLHK) according to established procedures, including direct site inspections, completeness of permit documents, facilities, and sampling and interviews. Limited human resources and facilities are significant obstacles in implementing this monitoring. Close coordination between the DLHK, security forces, and partner communities is highly relied upon as an effective strategy to prevent illegal logging. Overall, this mechanism aims to maintain forest sustainability and ensure that logging activities are carried out in accordance with applicable regulations for the sake of environmental sustainability in the region. However, successful control does not depend solely on technological sophistication but also requires strong synergy between various relevant parties. Therefore, close coordination with security forces is crucial as law enforcers who have the authority to take action against these illegal activities. Furthermore, involving partner communities in routine patrols provides added value because they possess in-depth local knowledge and concern for forest sustainability in their environment. This participatory approach not only expands the scope of control but also fosters a sense of shared responsibility in

protecting the forest. An interview with Mr. Sony Yuda S.Hut, Head of the Subulussalam City Forest Management Agency (BKPH), stated that: "The mechanism for controlling deforestation in this region involves several strategic steps. First, the Environment and Forestry Agency (DLHK) conducts routine patrols and direct control in locations prone to deforestation by involving forestry police (Polhut) and other security forces. In addition to field control, the DLHK also utilizes technology-based monitoring systems, such as the use of satellite imagery or drones, to detect illegal activities quickly and accurately." (Interview, May 7, 2025).

Based on the interview results above, it can be analyzed that the DLHK's implementation of the deforestation control mechanism in the Simpang Kiri Forest Management Resort (RPH) area, Subulussalam City, is implemented through several strategic steps. First, the DLHK conducts routine patrols and direct control of deforestation-prone locations, involving forestry police (Polhut) and other security forces. In addition to field control, the DLHK also utilizes technology-based monitoring systems, such as satellite imagery or drones, to detect illegal activities quickly and accurately. The DLHK carries out intensive coordination with the surrounding community and relevant stakeholders so that the control role does not rely solely on the government, but also receives participatory support from residents and community organizations. The DLHK also increases socialization and legal education activities regarding the importance of forest conservation and the legal consequences for perpetrators of encroachment. In terms of enforcement, the DLHK applies law enforcement procedures in accordance with forestry regulations, in the form of warnings, administrative sanctions, and, if necessary, continued reporting to law enforcement officials for further proceedings. A rehabilitation approach is also emphasized through reforestation programs and restoration of the function of damaged forest areas. Then Mrs. Linda Santi Saragih as Public Relations of Canro Manik (Wood Factory) said that:

"The mechanism for controlling deforestation involves the Environment and Forestry Service conducting routine patrols, document checks, and coordinating with security forces to crack down on illegal activities. The active role of local communities as partners in control is also crucial in preventing forest destruction." (Interview, May 15, 2025).

Then he also added that:

"Local communities are actively involved through complaints and joint patrols, forming communities or groups that care about forests and become partners in forest monitoring. This community involvement is considered crucial for strengthening forest management and increasing the effectiveness of preventing forest damage." (Interview, May 15, 2025).

Based on the interview results above, it can be concluded that the forest logging control mechanism involves the Environment and Forestry Service conducting routine patrols, document checks, and active coordination with security forces to crack down on illegal activities. The role of local communities is vital as control partners through complaints and joint patrols, forming forest care communities that help strengthen oversight and increase the effectiveness of preventing forest damage. This collaborative approach reflects an integrated effort between the government and the community to maintain sustainable forest conservation. In addition to direct patrols, control at the Simpang Kiri RPH also faces obstacles such as limited human resources, infrastructure, and operational costs, which affect control effectiveness. Therefore, coordination between elements, including the Forestry Service, security forces, and the community, is key to ensuring optimal control. All parties are expected to coordinate with each other, be accountable, and carry out control duties in a disciplined manner so that control of illegal logging can be properly enforced.

Then Alijikri Yanto, representing HAKA Banda Aceh, said that:

"Government officials, such as the Forestry Police (Polhut) and other security forces, play a key role in patrolling, monitoring, and enforcing forest management violations. They conduct routine patrols to prevent illegal logging and take legal action against violators." (interview, May 10, 2025).

Based on the interview results above, it can be concluded that the Forestry Police (Polhut) have a central and strategic role in implementing patrols, monitoring, and law enforcement against forest management violations. They are tasked with conducting routine patrols to prevent illegal logging activities and taking firm action against violators through legal actions such as arrests, confiscation of evidence, and filing official reports regarding forestry crimes. Polhut also plays a role in coordinating with other law enforcement agencies to ensure the investigation and law enforcement process runs effectively. With special police authority in the forestry sector, Polhut functions as the front guard in maintaining the sustainability and security of national forest areas. Legally, this control refers to laws and regulations related to the prevention of logging and environmental protection. Thus, the control mechanism in Subulussalam combines operational technical aspects, synergy between institutions, and local community involvement as the main foundation in maintaining forest sustainability in the region. From the analysis of the interviews with several informants above, it can be concluded that forest logging control at the Simpang Kiri Forest Management Resort (RPH), Subulussalam City, is carried out through the integration of advanced technology and a

collaborative approach. The Environment and Forestry Department (DLHK) is adopting technologies such as satellite monitoring systems, smart patrols, and the use of drones and satellite imagery for rapid and accurate monitoring of illegal forest activities. This aligns with conservation area management practices that increasingly rely on technology for control, such as the Smart Patrol system, which manages an integrated database and enables field officers to conduct effective control.

On the other hand, successful control depends not only on technology but also on close coordination between the Environment and Forestry Agency (DLHK), security forces such as forestry police, and local communities as control partners. The active role of the community is crucial as a local control mechanism that can provide early information and assist in routine patrols, thus making preventive and enforcement actions against illegal logging more effective. This mechanism also includes checking legal documents and direct patrols at deforestation-prone areas. With a layered approach combining technology and collaboration between stakeholders, control at the Simpang Kiri RPH becomes a system that is not only responsive but also adaptive to the threat of illegal logging and forest destruction. Technology accelerates detection while coordination ensures that enforcement measures and community development are carried out simultaneously, which can reduce deforestation rates and maintain the sustainability of forest areas in the region. The results of this study support the findings of previous research on Deforestation Control in the Study of Forest Areas in Subulussalam City, Aceh, regarding prevention through the linkages between village governments, government agencies, and communities who play a role in conserving forests in Subulussalam (Endah, 2020). According to Winardi (2007), he explains that control is not only about looking at something carefully and reporting the results of monitoring activities, but also means improving and straightening it out so that previously planned goals are achieved.

**Restricted Logging Permit**

Restricted logging permits are essential to prevent environmental damage and pollution in surrounding communities. The purpose of these restricted logging permits is to protect against pollution, ensure public health, ensure community survival, preserve ecosystems, control the use of natural resources, and achieve environmental harmony, balance, and balance.

Based on an interview with Mr. Erlan Aan Suriansyah as Head of Environmental Management and PPLH at the Subulussalam City Environment and Forestry Service, he said that:

"Logging permits are issued strictly through administrative and technical verification. The main obstacles are limited supervisors and the vastness of the forest. Routine monitoring is carried out in collaboration with security forces. Violations are subject to sanctions such as fines or permit revocation. The community is involved through complaints and joint patrols to increase the effectiveness of control." (Interview, May 7, 2025).

Then he also added that:

"The Directorate of Forest Resources Inventory and Monitoring (IPSDH) under the Ministry of Forestry is responsible for national forest monitoring, including providing annual land cover and deforestation data. This data is then published in the system and can be accessed by any agency through formal requests. At the regional level, the Forest Area Stabilization Agency (BPKH) acts as the IPSDH representative. Therefore, if the regional Environment and Forestry Service (DLHK) does not have this spatial data, it is because they have not submitted a formal data request to IPSDH. The distribution of this data is limited and is only provided upon formal request to maintain accuracy and control data distribution." (Interview, May 7, 2025).

Based on the interviews above, the researcher analyzed that the issuance of forest logging permits is strictly carried out through administrative and technical verification processes to ensure compliance with regulations. However, the limited number of supervisors and the vastness of the forest area are major obstacles to oversight, so routine monitoring is carried out in collaboration with security forces. Violations detected are subject to sanctions in the form of fines or permit revocation. The community is also actively involved through complaint mechanisms and joint patrols to increase the effectiveness of illegal logging control. In addition, the Directorate of Forest Resources Inventory and Monitoring (IPSDH) of the Ministry of Forestry serves as the manager of national spatial data on land cover and deforestation, which can be accessed by relevant agencies through formal requests. At the regional level, the Forest Area Stabilization Center (BPKH) serves as the IPSDH representative. If the Environment and Forestry Service (DLHK) does not have this spatial data, this is because it has not yet formally requested the data from IPSDH. Dissemination of this data is limited and only upon request to ensure accuracy and control of data distribution. Restricted logging permits in Indonesia are governed by several regulations that govern the governance and control of tree felling to ensure it does not exceed established limits. One relevant regulation is Regulation of the Minister of Forestry of the Republic of Indonesia Number P.58 of 2021 concerning the Rights, Obligations, and Prohibitions for Holders of Timber Utilization Permits (IPK). This regulation stipulates the procedures for issuing logging permits,

strict control mechanisms to prevent permit holders from harvesting beyond their quota, and administrative sanctions such as fines and permit revocation in the event of violations. The permit issuance procedure involves submitting an application letter stating the purpose of the felling, the location, and the number of trees to be felled. A permit can only be granted after the applicant meets the applicable administrative and technical requirements. Permit holders are required to carry out logging in accordance with the permit provisions and are obligated to replant replacement trees according to the specified size and number. Furthermore, permit holders must comply with all listed requirements and carry out logging under the supervision of authorized officials. Restricted logging permits are also regulated by technical regulations, which include the imposition of administrative sanctions for violations, such as exceeding the permit quota, violating the location, or failing to replant. Local governments typically also impose logging permit fees based on the number and diameter of trees felled to compensate for maintenance costs and environmental impact. An interview with Linda Santi Saragih, Public Relations Officer for Canro Manik (Wood Mill), stated:

"I understand that limited logging permits must be adhered to for sustainable business operations. However, sometimes provisions regarding changes to quota limits or procedures are not optimally communicated, resulting in less smooth permit management. We strive to follow the rules and report logging activities, but if violations occur, the forestry service usually takes action.

"We hope for assistance so we can manage our permits properly and in accordance with the provisions." (Interview, May 15, 2025).

The interviews above demonstrate the importance of adhering to logging permit limits for sustainable business operations. However, inadequate publicity regarding quota changes or procedures sometimes hinders permit management. Respondents strive to comply with regulations and report activities, and expect government assistance to ensure proper permit management in accordance with regulations. This underscores the need for clear public awareness and ongoing support to support effective and sustainable forest management. This partnership also fosters a sense of collective responsibility between officials and the community, ensuring that control is not a one-person task but a continuous, collaborative effort. This approach is considered effective in enhancing control effectiveness because it combines the strengths of local human resources and officials, and strengthens social relationships that support forest conservation. Developing this community partnership with the Forest Police (Polhut) increases the scope of control, strengthens environmental awareness, and fosters a spirit of mutual cooperation in maintaining forest sustainability, thus establishing a model for participatory and sustainable forest management.

Based on the latest monitoring results conducted by the HAkA Foundation, there has been a loss of forest cover of 10,610 Ha in Aceh Province throughout 2024. The figure of forest cover loss has increased by 19% or 1,705 Ha compared to what occurred in 2023. The Aceh Environment and Forestry Service (DLHK) stated that PT Sawit Panen Terus (SPT) which is suspected of removing 14 hectares of protected forest cover in Subulussalam, Aceh has carried out reforestation. Based on findings in the field, the forest damage that occurred around Cipar-pari Timur Village, Namo Buaya, Singgersing, Sultan Daulat District, Subulussalam City was not carried out by PT SPT, because it turns out that there are many forests that are privately owned. Then an interview with Mr. Alijikri Yanto as HAKA Banda Aceh said that:

"Limited logging permits are crucial for preventing deforestation, but in practice, controls remain weak. Many permit holders exceed their quotas without serious consequences due to limited controls and weak law enforcement. Sanctions are often merely formalities with no deterrent effect. We encourage more active community involvement and optimization of control technologies such as satellite imagery to ensure these permits are truly effective in protecting forests." (Interview, May 10, 2025).

Based on the interviews above, it can be seen that limited logging permits are crucial for preventing deforestation. However, current controls remain weak, resulting in numerous quota violations without strict sanctions. Sanctions are often merely formalities and lack a deterrent effect. Active community involvement and the use of control technologies such as satellite imagery are needed for permit mechanisms to be effective in protecting forests. However, despite these efforts, significant pressure remains on forest areas, particularly in areas designated for other uses (APL) and protected forests. This indicates that challenges such as encroachment and illegal use of forest areas remain serious problems and have not been fully addressed. These forest areas are vulnerable due to their potential for illegal exploitation or conversion, and existing controls are not yet fully capable of addressing them. Previously, the Aceh Natural Forest and Environment Foundation (HAKA), through satellite imagery monitoring, discovered land clearing activities in protected forest areas around Cipar-pari Timur Village, Namo Buaya, Singgersing, Sultan Daulat District, Subulussalam City, Aceh. The land clearing is suspected to have been carried out by PT SPT without a permit. HAKA monitoring shows that forest destruction at the PT SPT site began in July 2022, marked by road clearing based on satellite imagery analysis from that month.

The need for improved law enforcement is highlighted in this statement, indicating that legal aspects and

sanctions for perpetrators of forest destruction may still be under-implemented or insufficiently firm. Furthermore, support from various parties is expected, indicating that forest management requires synergy between the government, law enforcement officials, communities, and other stakeholders to maximize forest control and preservation. From the analysis of interviews with several informants above, it can be concluded that the Environment and Forestry Agency (DLHK) has implemented fairly effective forest control measures through intelligent monitoring and patrols. However, pressure on forest areas remains, particularly in APL (Apartment Use Area) and protected forests. To optimally address this issue, stricter law enforcement and collaborative support from various parties are needed. This synergy is crucial for strengthening forest protection and ensuring sustainable environmental sustainability. This research is relevant to several previous studies that discuss the causes, impacts, and efforts to reduce deforestation, particularly in the context of planning. These results also support previous research, which found that deforestation in protected forests has significant impacts on various aspects, namely ecology, social, and economy (Yunqui, 2023).

According to Henry Fayol, supervision consists of testing whether something has taken place according to what was planned and determined by the instructions that have been outlined. It has the aim of being able to show or also determine deficiencies and errors in order to correct and also prevent the recurrence of these errors so that these errors do not recur. There are 4 functions of supervisory management, namely, planning, organizing, directing, controlling. (Fayol, 1985).

**Law Enforcement and Administrative Sanctions**

Law enforcement in controlling logging in Subulussalam City, Aceh, is a crucial step in preserving forests from damage caused by illegal activities. Applicable law refers to the Forestry Law and other related laws, which authorize law enforcement officials, such as the police and the forestry service, to control, prosecute, and provide a deterrent effect to perpetrators of illegal logging. In addition to law enforcement through criminal proceedings, preventative measures include routine patrols and community outreach to encourage their active participation in forest protection. Administrative sanctions are one of the instruments used by the government to monitor the implementation of logging permits in accordance with regulations. These sanctions vary, from written warnings for minor violations to substantial fines and the suspension or revocation of business permits for repeated or serious violations. Provisions related to administrative sanctions are stipulated in government regulations and the Ministry of Forestry regulations governing forest resource governance, providing a strong foundation for enforcing administrative discipline in forestry activities.

The following is an interview conducted by the researcher with Mr. Dedek Hafi Ismanto S.Hut., M.si as Sub-Coordinator of the Forest Inventory and Planning Section, he said that:

"In my opinion, law enforcement in our area has been going quite well, especially with routine patrols and coordination with the Forest Police. However, there are still technical obstacles and limited resources that prevent enforcement against illegal logging perpetrators from being optimal. Administrative sanctions such as permit suspensions also help provide a deterrent effect, but stricter controls are needed to prevent repeat violations." (Interview, May 7, 2025).

Based on the interview results above, the researcher concluded that law enforcement in the region is quite good, with routine patrols and coordination with the Forest Police. However, technical constraints and limited resources hamper prosecution of illegal logging perpetrators. Administrative sanctions such as permit suspensions are effective in providing a deterrent effect, but stricter controls are needed to prevent perpetrators from repeating violations. Therefore, although the foundation for law enforcement is in place, increased resources and control after sanctions are essential for more optimal and sustainable law enforcement. One mechanism for controlling deforestation in Subulussalam City that causes this is law enforcement and administrative sanctions, which are among the instruments used by the government to ensure that logging permits comply with regulations. These sanctions vary, ranging from written warnings for minor violations to large fines and the suspension or revocation of business permits for repeated or serious violations. Furthermore, in the interview, Ms. Linda Santi Saragih, Public Relations Officer of Canro Manik (Wood Mill), stated that:

"I see these administrative sanctions as crucial for maintaining business order. We always try to comply with the regulations for fear of having our business permits revoked, which would mean we have to stop operating. However, the frequently changing regulations sometimes force us to constantly adapt. I hope for more support from the government to ensure our business remains sustainable without destroying the forest." (Interview, May 15, 2025). From the interviews above, researchers can conclude that administrative sanctions are crucial for maintaining order and compliance in business, as the threat of permit revocation makes business actors more cautious. However,

frequent regulatory changes present a challenge, requiring constant adaptation. Communities expect government support to ensure sustainable business operations without damaging forests, demonstrating the need for support to achieve both compliance and environmental conservation. Referring to the Command and Control theory proposed by Anderson and Leal (2001:35), they emphasize the importance of a regulatory approach that relies on unilateral government-imposed standards and obligations to regulate public behavior. The government determines the rules that must be complied with and imposes sanctions for violations, such as revocation of business permits. This includes a thorough understanding of the goals and objectives of law enforcement, which must be communicated clearly to the target group. Administrative sanctions, such as freezing business permits, are part of a mechanism aimed at providing a deterrent effect so that business actors comply with the rules and do not damage the forest. By combining formal legal instruments and forest resource management strategies involving various parties, deforestation control in Subulussalam City can be more effective and sustainable. Law enforcement and the application of administrative sanctions signal the importance of compliance to businesses and the community, while technological empowerment and control support sustainable forest protection efforts. An interview with Mr. Sony Yuda S.Hut, Head of the Subulussalam City Forest Management Agency (BKPH), stated that:

"Currently, the Forest Management Agency (BKPH) routinely patrols and takes action against illegal logging with sanctions ranging from warnings to permit revocation. Coordination with the police, TNI, NGOs, and the community is crucial. The main challenges are limited resources and perpetrators from outside the region. The community is actively involved in control." (Interview, May 7, 2025) Based on the analysis of the interview, it is explained that the BKPH (Forest Management Unit) routinely conducts patrols and takes action against illegal logging activities, with sanctions ranging from warnings to permit revocation. This demonstrates systematic law enforcement efforts based on applicable regulatory mechanisms. Cross-sector coordination with the police, TNI, NGOs, and the community is key. important in control and enforcement, indicating the existence of synergy between stakeholders that strengthens the effectiveness of forest management.

The results of this interview align with findings from previous studies, such as those by Endah (2020) and Yunqui (2023), which emphasized the importance of cross-sector coordination and active community participation in controlling deforestation. Previous research also indicates that limited human resources and infrastructure, along with economic pressures, are major obstacles to forest management. Furthermore, the dynamics of illegal logging perpetrators originating from outside the region underscore the need for policies that accommodate cross-regional control and strengthen law enforcement at the regional and national levels, as recommended in studies related to sustainable forest management. Furthermore, an interview with Mr. Alijikri Yanto from HAKA Banda Aceh stated that:

"Deforestation remains a concern. We monitor with limited personnel and a large area, working with the Forest Management Agency (BKPH) and law enforcement agencies to enforce the law. Administrative sanctions are quite effective, especially against large companies. We use technology like satellites and drones for detection." (interview, May 10, 2025).

The analysis of the interviews revealed that deforestation remains a significant issue requiring serious attention. Control measures are implemented despite limited human resources (personnel) and limited area coverage, which are key challenges in controlling deforestation. Enforcement efforts are carried out in collaboration with the Forest Management Unit (BKPH) and law enforcement officials, strengthening the effectiveness of control measures and sanctions. Administrative sanctions, particularly those imposed on large companies, are considered quite effective in providing a deterrent effect and encouraging compliance with forestry regulations. Furthermore, modern technologies such as satellite imagery and drones are being used to detect illegal activities quickly and accurately, helping to overcome control challenges in the vast and difficult-to-reach areas.

These findings align with previous research, which emphasized the importance of synergy between institutions, particularly forest management agencies (such as the Forest Management Agency (BKPH), law enforcement, and communities, to ensure effective law enforcement against illegal deforestation. Furthermore, limited personnel and vast territories as control barriers were also confirmed in previous research, which also recommended increasing human resource capacity and utilizing modern control technology as solutions. Similarly, the use of technology such as satellites and drones is recognized as an innovative and strategic step to overcome the geographical and operational challenges of real-time and accurate forest monitoring. Based on the above research findings in the Subulussalam region and Aceh in general, deforestation control does not rely solely on law enforcement and administrative sanctions, but also through additional approaches such as strengthening Forest Management Units (KPH), implementing forest monitoring technology, and local community empowerment programs. This participatory approach is expected to strengthen local authority and encourage community participation.

to actively participate in preserving forests, while also preventing further forest destruction. Imposing administrative

sanctions, particularly on large companies, also aligns with policies proposed in previous research as an effective form of command and control to create a deterrent effect. However, the research also suggests that the success of these sanctions requires continued control and support mechanisms to prevent repeat violations.

**Obstacles to Deforestation Control in Subulussalam City**

Control constraints are factors that hinder the implementation of the deforestation control process carried out by the Subulussalam City Environment and Forestry Service. The following are control constraints faced by the Subulussalam City Environment and Forestry Service.

**Internal Inhibitor**

In the deforestation control carried out by the Subulussalam City Environment and Forestry Service, researchers found control constraints in the form of internal factors within the Subulussalam City Environment and Forestry Service. These internal factors consist of human resources, budget, facilities and infrastructure. The following is an explanation of several internal factors found in the field. Lack of human resources can affect the control carried out by the Subulussalam City Environment and Forestry Service. In implementing control, a number of supporting and qualified officers are required. If the control officers do not have quality, the success rate in implementing control is very low. The officers of the Subulussalam City Environment and Forestry Service who carry out control are employees in the Environmental Management and PPLH Division, totaling 5 people.

Based on the interview conducted by the researcher with Mr. Dedek Hafi Ismanto S.Hut., M.si as Sub-Coordinator of the Forest Inventory and Planning Section, he said that:

"control in the Environmental Management Sector should be carried out by five employees, but often less than five people because some are absent. Ideally, control is carried out by functional officials, but because in Subulussalam City there are no functional control officials, it is carried out by the DLHK. In the DLHK itself there are also no functional officials, so control becomes part of the DLHK's duties and functions. " (Interview, May 7, 2025). From the results of the interview above, the researcher can analyze that control is carried out by DLHK employees of Subulussalam City in the Environmental Management and PPLH fields totaling 5 people or how many were present when the control was carried out. Supervision is generally carried out by functional officials in the control sector, but in Subulussalam City there are no functional officials in control, especially in the Subulussalam City Environmental and Forestry Service.

Based on the results of the researcher's observations in the field, it was found that control was indeed carried out by the Environmental Management and PPLH Division with the number of employees in the division, the number of control officers indicates that there is a lack of personnel in control because control is not only carried out by working staff, but also carried out in other plantation industry businesses in the Subulussalam City area. Control also requires operational facilities and infrastructure such as operational cars, mini laboratories, water and air quality measuring instruments and so on which function to support the implementation of control by the Subulussalam City DLHK. Based on an interview with Mr. Erlan Aan Suriansyah as Head of Environmental Management and PPLH at the Subulussalam City Environment and Forestry Service, he said that:

"Control constraints are usually a lack of control tools, such as wastewater, water, and air quality measuring devices. The DLHK also lacks operational vehicles for control, and there's also no mini-laboratory at the DLHK. Funding is also lacking for control implementation." (Interview, May 7, 2025).

From the interview results above, the researcher can analyze that the control constraints are the lack of funds and facilities and infrastructure in the form of waste, water and air quality measuring instruments, the absence of a mini laboratory and operational vehicles in the implementation of control. The lack of funds and infrastructure owned by the Subulussalam City Environmental Agency (DLHK) to carry out existing controls in Subulussalam City, especially in the Plantation Industry, can hamper the implementation of the established or planned control process. Control of deforestation or deforestation in Subulussalam City faces various significant internal obstacles, which greatly affect the effectiveness of control and implementation of regulations. From the interview results, it was found that the Subulussalam City DLHK lacks important control tools such as waste, water and air quality measuring instruments. In addition, the DLHK also does not have an operational vehicle to support control activities in the field, and there is no mini laboratory needed to conduct rapid analysis of environmental conditions. Limited funds are also a major obstacle that hinders the implementation of maximum control, starting from the frequency of control to the purchase of tools and human resource training. According to Anderson and Leal (2001:35), the Command and Control theory is crucial in addressing this barrier because it emphasizes the importance of government regulations, logging permit restrictions, and environmental law enforcement as key steps in controlling deforestation. Regulations such as bans on illegal logging and restrictions on the issuance of logging permits are designed to limit activities that damage

forests illegally or that are inconsistent with sustainable management. However, without adequate control facilities and infrastructure, these regulations are difficult to enforce. Limited control equipment and operational vehicles hamper the rapid response of officers in monitoring and taking action in the field. The absence of a mini-laboratory also limits the Environment and Forestry Agency's (DLHK) ability to conduct rapid and accurate environmental analyses, which should serve as the basis for targeted law enforcement. Insufficient funding further exacerbates this situation, as optimal control requires costs for operations and human resource capacity development. Consequently, even though regulations and permit restrictions are in place, without firm and consistent control and enforcement, the implementation of these policies is less effective. Illegal logging and permit violations have the potential to continue undetected and unpunished, making deforestation in Subulussalam City difficult to control effectively.

**External Inhibitors**

External constraints are constraints from outside the Subulussalam City Environment and Forestry Service. The external factors are natural factors that can also hinder the implementation of control, such as rain falling during the implementation, which makes it impossible for officers to carry out control properly. Then, an interview with Mr. Sony Yuda S.Hut as the BKPH of Subulussalam City said that: "It could be that weather factors, especially heavy rain, often hinder the implementation of control in the field because it makes access difficult and endangers the safety of officers, so that control cannot be carried out optimally according to schedule. This condition is a natural constraint that cannot be controlled but has an impact on the effectiveness of control." (Interview, May 7, 2025) Based on these constraints, it can be concluded that the constraints faced indicate that control in external factors, namely natural factors, especially weather conditions such as heavy rain, is a significant obstacle in the implementation of environmental control in Subulussalam City. Intensive rain makes access to control locations difficult or even impossible for officers to reach. In addition, limited supporting facilities and efforts to maintain officer safety further limit their ability to monitor effectively.
directly in the field. As a consequence, control activities often cannot be implemented optimally according to the predetermined schedule.

This condition is an external factor beyond the control of the Environment and Forestry Agency (DLHK), but it significantly reduces control effectiveness. This demonstrates that in managing environmental control, in addition to considering internal aspects such as resources and facilities, it is also necessary to consider natural factors and develop adaptation strategies to ensure control continues despite weather constraints. For example, increasing the use of remote control technology or flexible rescheduling of control activities could be solutions to overcome obstacles caused by these natural factors.

Furthermore, Mrs. Linda Santi Saragih, Public Relations Officer of Canro Manik (Kilang Kayu), added that: "Yes, rain is often a major obstacle in control. Especially when it is heavy, access to the control location is difficult or even impossible. This condition prevents officers from carrying out monitoring optimally due to safety factors and limited supporting facilities. Usually, we have to postpone control until the weather conditions improve so that activities can run safely and effectively." (Interview, May 15, 2025). From the results of the interview above, the researcher can analyze that weather factors, especially heavy rain, are one of the main obstacles in implementing environmental control in the field. Significant rainfall makes it difficult for officers to access the control location, so that monitoring activities cannot be carried out optimally. In addition, officer safety is also a major concern so that control must be postponed in the hope that weather conditions will improve. The limited supporting facilities available further exacerbate this obstacle, because without adequate facilities, implementing control in bad weather becomes less effective and risky. This condition is an external challenge that is difficult for supervisors to control, but its impact is very noticeable on the effectiveness of control. Therefore, adaptation strategies are needed, such as the use of remote control technology or rescheduling of control activities, to ensure environmental control tasks continue despite unfavorable weather conditions. An interview with Mr. Alijikri Yanto, a representative from HAKA Banda Aceh, stated:
"The main obstacle is the lack of buffer zones in some areas, making conservation forests easily under pressure, as well as unclear land legality documents. We also see the need to increase community capacity in sustainable forest management and cross-sector synergy." (Interview, May 10, 2025) The interview above with HAKA Subulussalam City revealed that buffer zones in some areas make conservation forests more vulnerable to pressure from human activities and environmental change. Furthermore, unclear land legality documents exacerbate the situation, as unclear boundaries and land status open up opportunities for ownership conflicts and misuse of forest functions. This condition creates serious challenges in maintaining forest sustainability. Furthermore, community capacity in sustainable forest management also needs to be improved so that they can play an active and responsible role in protecting and utilizing forest resources wisely. This is important not only for conservation, but also for supporting

the sustainable economic life of local communities. In this context, cross-sector synergy is crucial. Strong collaboration between the government, communities, non-governmental organizations, and the private sector can unify the vision and strengthen forest protection efforts. This approach also allows for capacity building through training, outreach, and the strengthening of clear and accountable regulations. Several practices in various regions demonstrate that multi-stakeholder synergy is effective in preserving forests while providing economic benefits to surrounding communities. Deforestation control in Subulussalam City faces significant external obstacles, particularly natural factors such as heavy rainfall, which often hamper implementation in the field. Heavy rain makes access to control locations difficult or even impossible, endangering the safety of officers. This situation forces control to be postponed until the weather improves, preventing control from being implemented optimally and sustainably as scheduled. Furthermore, pressure on conservation forests is increasing due to the lack of effective buffer zones in some areas, as well as unclear land legality documents, which lead to land use conflicts.

In the Command and Control Theory proposed by Anderson and Leal (2001:35), deforestation control should be implemented through three main pillars: government regulations, such as a ban on illegal logging; restrictions on logging permits; and environmental law enforcement. However, the effectiveness of these three pillars depends heavily on the ability of regulatory institutions to effectively carry out their functions in the field. Natural factors such as bad weather and limited buffer zones directly impact the implementation of control measures, which are an instrument for enforcing environmental law. When control measures are delayed or not implemented due to heavy rain and difficult access, illegal loggers have the potential to operate undetected. Furthermore, unclear legal documentation complicates the implementation of logging permit restrictions, thus weakening enforcement. Suboptimal community capacity and a lack of cross-sector synergy also weaken the implementation of effective regulations and controls. In this case, even though regulations and permit restrictions exist, these external obstacles reduce the effectiveness of Command and Control as a deforestation control approach. Therefore, strategic steps are needed, such as strengthening institutions and adaptive control tools to natural conditions, for example, the use of remote control technology, improving land legality administration, and increasing community capacity through training and intersectoral synergy. This is important so that government regulations and law enforcement can run effectively in preventing and controlling deforestation in the Subulussalam City area.

## CONCLUSION

From the results of research that has been conducted and obtained by researchers in the field regarding the Control of Deforestation (Deforestation) Study of Forest Areas in Subulussalam City, Aceh, it can be concluded that:

1. The Deforestation Control Mechanism in Subulussalam City has been implemented through a mechanism involving the Environment and Forestry Service (DLHK) as the main managing agency. This mechanism includes routine field patrols, inspection of permit documents, coordination with security forces such as the Forestry Police (Polhut), and the use of advanced technology such as satellite monitoring, smart patrols, and drones to detect illegal activity. Furthermore, local communities are actively involved as control partners through complaints and joint patrols to increase the effectiveness of monitoring and preventing forest damage. This approach emphasizes the importance of synergy between the government, law enforcement officials, and the community in maintaining forest sustainability.
2. Obstacles to Deforestation Control in Subulussalam City face several significant obstacles, both internal and external. Internal obstacles include limited human resources, a lack of supporting facilities and infrastructure such as environmental quality measurement tools, operational vehicles, and limited funding. External factors, such as natural conditions such as heavy rain, which hamper patrols and field monitoring, are also major obstacles. Furthermore, pressure from land conversion, a lack of buffer zones, and unclear land legality exacerbate control efforts. Suboptimal law enforcement and administrative sanctions that lack a deterrent effect also hamper the success of deforestation control.

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**Undang-undang**

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