Collaborative Governance and Management in Forest and Critical Land Rehabilitation: A West Java Case Study

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ABSTRACT

Protected forest management in Indonesia, particularly in Sukabumi Regency, faces various challenges related to policy implementation and inter-agency coordination. This study aims to analyze protected forest management in Sukabumi through the application of good governance principles, with a focus on improving institutional capacity and coordination between stakeholders. The research method used is a descriptive qualitative approach, with data collection techniques through in-depth interviews, documentation studies, and field observations. The results indicate that the main obstacles in protected forest management are budget constraints, low inter-agency coordination, and the community's economic dependence on forest resources. Although planning is in place, implementation in the field remains limited. This study concludes that strengthening technical capacity, inter-agency coordination, and more consistent application of good governance principles can increase the effectiveness of protected forest management. The contribution of this research is to provide practical solutions to improve forest governance and enhance the sustainability of protected forest management in Indonesia.

INTRODUCTION

Protected forest management plays a crucial role in maintaining ecosystem balance, regulating water management, and preventing hydrometeorological disasters (Feng et al., 2024; Raj et al., 2025). In Indonesia, protected forest areas are at the forefront of protecting natural resources crucial for life (Sreekar et al., 2024; Wulandari et al., 2023). However, despite the vital role of protected forests in environmental sustainability, significant challenges remain in their management, particularly in terms of effective policy implementation and governance (Zhang et al., 2023). Therefore, this research is crucial to provide a deeper understanding of how protected forest management can be optimized

through the application of good governance principles and increased institutional capacity at the regional level. Successful protected forest management impacts not only environmental conservation but also the well-being of surrounding communities dependent on forest products (Kigenyi et al., 2024; Delgado et al., 2023).

One of the main challenges faced by local governments in managing protected forests is weak management capacity and suboptimal governance (Yigitcanlar et al., 2024). This is due to various factors, including a lack of coordination between relevant institutions, limited community participation, and economic pressures that threaten the sustainability of forest areas (Ullah, 2025). Sukabumi Regency, which has a significant forest area, presents similar challenges, with forest destruction and land conversion increasing, despite the area being designated as a protected area. Previous studies have shown that the decentralization of forestry authority stipulated in Law No. 41 of 1999 does not automatically improve the quality of forest management without strengthening institutional capacity and better coordination between stakeholders (Salampessy et al., 2024).

Field observations demonstrate a mismatch between existing forest protection policies and the conditions faced on the ground. In Sukabumi Regency, although a large portion of its territory has been designated as a protected area through Regional Spatial Planning Regulation No. 10 of 2023, the reality on the ground shows that forest management still faces numerous obstacles. Land conversion and economic pressures on communities dependent on forest areas for their livelihoods are complex issues. Data from the West Java Statistics Agency (BPS) shows increasingly widespread forest destruction (Trihatmoko et al., 2024). Therefore, it is important to analyze the factors hindering protected forest management and how the application of good governance principles can improve its effectiveness.

Several previous studies have demonstrated the importance of implementing good governance principles in forest management. Oematan et al. (2025) emphasize that good governance will improve oversight and encourage community involvement in natural resource management (Jackson et al., 2023). In the Indonesian context, Fredy (2022) found that decentralization of forestry authority, while granting greater autonomy to regional governments, does not automatically improve management quality without institutional strengthening (Marthahudi, 2024). However, while these studies provide insights into the importance of good governance, there is still a lack of discussion on how protected forest management at the regional level can be further improved by involving more parties in coordinated collaboration.

Previous research has also shown that collaboration between various parties, such as local governments, communities, and the private sector, can be key to sustainable forest management (Saefudin, 2024). However, there is a gap in research related to the identification of supporting and inhibiting factors that influence protected forest management at the regional level, particularly in Sukabumi Regency. Furthermore, previous studies tend to under-emphasize the crucial role of management in implementing good governance in the forestry sector (Yolamalinda et al., 2023). Therefore, this study aims to fill this knowledge gap by focusing on the role of management in protected forest management and how effective governance can be implemented at the regional level.

This research focuses on the main question: How does the local government perform in managing protected forests in Sukabumi Regency? What factors support and hinder protected forest management? This research will explore the application of good governance principles in protected forest management and analyze the managerial dimension within this governance. Based on preliminary arguments, strengthening institutional capacity, better coordination between stakeholders, and more consistent application of good governance principles will improve the performance of protected forest management in the region. This research's contribution is to provide practical solutions for improving forest management and preventing future forest damage.

The importance of this research lies in efforts to improve protected forest management in Indonesia, particularly in areas with a high risk of ecological disasters such as Sukabumi Regency. This research not only provides an understanding of the factors influencing protected forest management but also offers practical recommendations for improving efficient governance through the application of good governance principles and strengthening the managerial dimension. Therefore, the results of this research are expected to serve as a reference for local governments and other stakeholders in designing forest management policies that are more sustainable and responsive to community needs.

RESEARCH METHOD

This research uses a qualitative, descriptive approach, aiming to provide an in-depth description of the phenomena occurring in protected forest management in Sukabumi Regency. The qualitative approach was chosen because the research aims to understand the perceptions, experiences, and factors influencing protected forest management, which are difficult to measure quantitatively. A descriptive design was chosen to comprehensively describe

the situation, processes, and relationships between various elements in protected forest management. This approach allows the researcher to provide a detailed overview of policy implementation, governance, and the challenges faced by local governments in protected forest management.

This research was conducted in Sukabumi Regency, West Java Province, which has extensive protected forest areas and is potentially at high risk of ecological disasters. Sukabumi Regency was chosen as the research location due to its high relevance to the topic of protected forest management and the challenges faced in implementing forestry policies and governance. Based on data from the West Java Statistics Agency (BPS) (2023), forest areas in this region have experienced significant damage and land conversion. Furthermore, the Sukabumi Regency Spatial Planning Regulation No. Law No. 10 of 2023 designates a large portion of its territory as a protected area, making it an ideal location to analyze the implementation of forest management policies and the application of good governance principles.

Data for this study were collected through three main techniques: in-depth interviews, documentation studies, and field observations. Interviews were conducted with key informants selected using purposive sampling, including officials from the Environmental Agency (DLH), the Regional Development Planning Agency (Bappeda), staff from the Sukabumi Forest Management Unit (KPH), community leaders, and academics/NGOs with knowledge and experience related to protected forest management. The in-depth interviews aimed to obtain comprehensive information regarding policies, implementation, and challenges in protected forest management. The documentation study included analysis of related documents such as the Spatial Planning (RTRW), Strategic Plan (Renstra), Government Agency Performance Reports (LKjIP), KPH annual reports, and relevant scientific publications. These documents provide an objective picture of forest management policies and performance. Observations were conducted to obtain empirical data on the actual conditions of protected forest areas. Field observations enabled researchers to directly identify challenges and problems faced in protected forest management.

RESULT AND DISCUSSION
Protected Forest Management Planning and Policy

In this study, protected forest management planning and policies in Sukabumi Regency refer to the process of integrating forest area protection into regional planning documents such as the RTRW (Regional Spatial Plan), RPJMD (Rencana Pembangunan Jangka Menengah Daerah/RPJMD), and the Environmental Agency (DLH)'s Strategic Plan (Renstra). This process is expected

to form the basis for policies governing protected area management for conservation and monitoring purposes. However, protected forest management must be evaluated not only in terms of documentation but also in terms of implementation, including budgeting, inter-agency coordination, and program operationalization in the field.

An interview with Informant D1, an official from the Sukabumi Regency Environmental Agency (DLH), revealed that although the policy documents related to forest management are quite comprehensive, the biggest obstacle to their implementation is limited budget. According to the informant: "The documents are complete, but during implementation, we often encounter budget constraints. Many of our activities are ultimately cut or postponed." This statement indicates that despite good planning, budget constraints are a major obstacle to implementation, leading to delays or cuts in activities intended for protected forest management.

An interview with Informant D2 from the Sukabumi Regency Regional Development Planning Agency (Bappeda) revealed other challenges faced in protected forest management. Informant D2 stated that although the Regional Spatial Plan (RTRW) and the Regional Medium-Term Development Plan (RPJMD) regulate protected areas, program integration between agencies is not optimal. "Coordination between forest-related agencies, such as the Environment Agency (DLH) and the Forest Management Unit (KPH), is still weak. This results in several programs being implemented less than optimally, because not all parties are actively involved." This statement indicates that poor horizontal coordination between agencies is a major obstacle to realizing effective protected forest management policies, which should involve various parties in their implementation.

Through field observations in protected forest areas in Sukabumi Regency, researchers found that the physical condition of the forests has experienced significant damage and land conversion. Many forest areas that should be protected are actually threatened by human activities, such as land clearing for agriculture or settlements. Despite conservation efforts undertaken by Forest Management Units (KPH), not all areas are equipped with clear Forest Management Plans (RPH). This indicates gaps in planning that are not fully integrated in the field. Researchers interpret this finding as indicating that although planning is documented, its monitoring and implementation do not

always go as expected, resulting in some protected forest areas remaining neglected.

Based on data obtained from interviews and observations, it can be concluded that although Sukabumi Regency has policy documents covering the Regional Spatial Plan (RTRW), Regional Medium-Term Development Plan (RPJMD), and Regional Environmental Agency (DLH) Strategic Plan (Renstra) relevant to protected forest management, the implementation of these policies still faces various obstacles. One major issue is budget constraints, which hamper the implementation of planned programs. Furthermore, poor coordination between various agencies and the absence of clear technical documents in the field, such as the RPH, further worsen the performance of protected forest management.

From the above findings, an emerging pattern indicates a gap between sound planning in these documents and implementation, limited by external factors, such as budget and inter-agency coordination. Although policies are clearly stipulated in key documents, this gap demonstrates a lack of continuity between planning and implementation. This pattern also reflects that despite efforts by the local government in protected forest management, supporting factors such as budget and inter-agency coordination remain significant barriers to achieving optimal management goals.

Institutions and Inter-Agency Coordination

The results of the analysis also show that stakeholder involvement is the main factor in the successful implementation of Islamic education public services. Stakeholders in the Islamic education environment not only consist of internal elements such as leaders and educators, but also involve external elements such as parents, alumni, the community, foundations, and the government. Their involvement reflects the form of social participation that is the main strength in the management of education based on Islamic values (Al Huda, 2025).

Stakeholder participation is manifested in various forms, ranging from moral and material support, to direct involvement in institutional activities. For example, the role of parents in providing input on the learning process and administrative services, community participation in the socio-religious activities of institutions, and policy support from the government through regulations and

coaching. This form of collaboration shows that there is a shared responsibility in improving the quality of Islamic education (Analisna et al., 2024).

Stakeholder engagement also serves as a mechanism for public oversight (public accountability). With the active participation of the community, Islamic educational institutions are required to be more transparent in terms of fund management, program implementation, and performance evaluation. This encourages increased accountability and builds public trust in institutions. When communication with stakeholders goes well, a sense of belonging arises. (sense of belonging) high level of educational institutions, so that the community becomes part of the solution to every challenge faced by the institution (Hasanah, 2025).

In the context of Islamic values, stakeholder participation reflects the application of the principles of shura (deliberation) and ta'awun (cooperation). Islam teaches that every important decision should be taken through deliberation to achieve the common good. Thus, stakeholder participation in educational services is not only an administrative activity, but also a form of implementation of Qur'anic values in the social life of education.

Implementation of the Protected Forest Management Program

Protected forest management in Sukabumi Regency is carried out through various programs and policies, including forest rehabilitation, area patrols, and community participation. Rehabilitation programs aim to restore damaged forest ecosystems, while patrols and area monitoring focus on protecting the area from the threat of further damage. Community participation, although formal, is expected to foster active engagement in forest conservation and management. Furthermore, the application of principles of good governance, transparency, accountability, and law enforcement are crucial for successful forest management. Despite a strong legal basis, the implementation of these programs is often hampered by various factors, such as limited resources, minimal oversight, and the community's dependence on the forest economy.

An interview with Informant M6 in 2024 revealed that most people clear land to meet their economic needs, such as living expenses and education. This reflects the community's continued strong dependence on forest products as a source of income. In the informant's view, forest clearing is a solution to address limited resources, particularly in addressing increasing economic pressures. "If we don't cultivate the land, what will we eat? Our children need money for

school," he said.

Another interview with an official at the Environment Agency (DLH) revealed that although the government has developed various conservation policies and programs, their implementation is hampered by limited budgets and a lack of technical capacity in the field. Informant B2, from the Regional Development Planning Agency (Bappeda), revealed that they want to utilize technology such as satellite imagery to monitor land cover changes, but limited staff technical skills and a lack of specialized operators are major obstacles to implementing this technology.

Field observations revealed that communities around protected forest areas tend to adopt spatial use patterns that adapt to economic fluctuations. When prices of agricultural commodities, such as coffee and secondary crops, increase, they tend to expand their agricultural land closer to protected forests. Conversely, when prices decrease, pressure on forests decreases. This indicates that land use decisions are heavily influenced by market and economic dynamics, which in turn increases the risk of forest damage due to encroachment.

Although some villages demonstrated awareness of the importance of conservation, there is a significant knowledge gap between community understanding of protected forests and prevailing conservation policies. Most communities perceive protected forests as acceptable for temporary use as long as they do not disrupt their ecological functions, reflecting a more limited understanding of the concept of long-term and sustainable conservation.

Researchers interpret that the performance of protected forest management in Sukabumi is influenced by various structural and social factors. Despite sound planning in the form of policies and programs, weaknesses lie in suboptimal implementation and oversight. The decline in environmental quality, particularly due to encroachment and vegetation degradation, indicates that rehabilitation efforts are not always successful. This is due to internal factors such as the lack of active community participation in planning and management, as well as constraints in maintaining and monitoring the area. Furthermore, limited technical capacity and resources also hinder effective policy implementation.

Patterns identifiable from this data indicate community dependence on natural resources, which impacts the success of forest rehabilitation programs. Communities prioritize personal economic interests, such as food and education, over long-term conservation efforts. This is exacerbated by a lack of understanding of the long-term benefits of forest rehabilitation. Furthermore, weak oversight and a lack of law enforcement result in many violations going unpunished, worsening the condition of protected forest areas. In other words, despite sound policies, ineffective implementation and community economic

dependence limit the success of protected forest management programs.

Discussion

The results of this study indicate a significant gap between the planning and implementation of protected forest management in Sukabumi Regency. Based on the findings, although policy documents such as the RTRW (Regional Spatial Plan), RPJMD (Rencana Pembangunan Jangka Menengah Daerah/RPJMD), and Renstra (Renstra) of the Environmental Agency (DLH) exist, their implementation is hampered by budget constraints and weak inter-agency coordination. This aligns with the findings of Ullah et al. (2024), who emphasized the importance of community involvement and adequate resources to support the success of forest rehabilitation programs. However, contrary to their findings, this study highlights that budget constraints are the biggest obstacle, not only disrupting rehabilitation but also hindering policy oversight and implementation (Mulpiyanti, 2025). This suggests that despite good planning, external factors such as financing and coordination are more dominant in determining policy effectiveness on the ground.

Furthermore, the community's economic dependence on forests is also a factor influencing the success of conservation programs. This aligns with Raihan (2023), who argued that forestry programs will be more effective if they provide direct benefits to the community. These findings illustrate that communities surrounding protected forest areas prioritize their economic needs, such as clearing agricultural land to cover living expenses and education, over preserving the forest (Suwardi et al., 2023; Ullah et al., 2024). Thus, there is a mismatch between conservation policies that prioritize long-term forest protection and the community's short-term economic needs. The theoretical implication is that researchers can develop a more integrated concept of sustainability, where the balance between conservation and community economic empowerment is a primary focus.

Limitations in the implementation of technology for area monitoring are also important findings in this study. For example, although GIS technology and satellite imagery can provide accurate data for monitoring land cover change, their utilization remains limited due to low technical capacity and existing infrastructure. These findings confirm the findings of a study by Bettinger et al. (2023), which noted that the lack of digital infrastructure and technical training at the regional level hinders the use of technology that could support more efficient forest management. The practical implication of these findings is the importance of improving technical capacity and infrastructure in the regions, particularly in villages surrounding forest areas, so that technology can be optimally utilized for forest monitoring and supervision.

The pattern observed in this study, where planning policies are often not followed by effective implementation, reflects weaknesses in the application of good governance principles, particularly in terms of transparency, accountability, and community participation. As noted by Post et al. (2023), many public sector programs in Indonesia only measure outputs, not outcomes. This is also evident in forest management in Sukabumi, where indicators of success focus primarily on the number of trees planted, while there is inadequate measurement of the extent of restored areas. The theoretical implication of these findings is that evaluations of forest management policies should place greater emphasis on outcomes, such as comprehensive ecosystem restoration, rather than solely on outputs, which can be misleading.

In conclusion, this study reveals that despite sound planning in protected forest management in Sukabumi Regency, budget constraints, weak inter-agency coordination, and the community's economic dependence on forests are major obstacles to policy implementation. Based on these findings, it is important to develop a more holistic approach that encompasses community economic empowerment, technical and infrastructure capacity building, and more outcome-based policy evaluation. This aligns with the thinking of Wei et al. (2024), who stated that sustainable forest management requires collaboration between policy, communities, and technology, as well as a balance between conservation interests and the economic needs of local communities.

CONCLUSION

This study found that although Sukabumi Regency has developed sound planning for protected forest management, the implementation of this policy faces significant obstacles. The most important findings of this study are that budget constraints, weak inter-agency coordination, and the community's economic dependence on natural resources are the main obstacles to the success of protected forest management. Furthermore, the principles of good governance, such as transparency, participation, and law enforcement, have not been optimally implemented. The lessons learned from this study are the importance of collaboration between government policies, community empowerment, and the use of technology to support more effective and sustainable forest management.

The strength of this paper lies in its contribution to enriching the scientific discourse on protected forest management in Indonesia, particularly in the context of regional governments facing resource constraints. This research provides new insights into the dynamics of forest management, which depend not only on policy documents but also on implementation, which is influenced by social and economic factors within the community. Furthermore, this study

offers practical recommendations that can be implemented at the regional level to improve the effectiveness of protected area management, such as increasing technical capacity, strengthening inter-agency coordination, and implementing modern monitoring technology.

The main limitation of this study is the limited data obtained from interviews with a small number of informants, which may not represent the views of all communities and stakeholders in Sukabumi Regency. Furthermore, field observations were limited to specific areas and did not cover the entire protected forest area in Sukabumi Regency. For future research, a more comprehensive study involving more informants from various levels of society and government, as well as broader data collection, is needed to strengthen the existing findings. Further research could also focus on evaluating the long-term impacts of forest rehabilitation programs and technology-based management in protected forest areas.

REFERENCES

Bettinger, P., Merry, K., Fei, S., Weiskittel, A., & Ma, Z. (2023). Usefulness and Need for Digital Technology to Assist Forest Management: Summary of Findings from a Survey of Registered Foresters. *Journal of Forestry, 121*(1), 1-11. https://doi.org/10.1093/jofore/fvac028

David Raj, A., & David Raj, A. (2025). Climate Change Induced Hydro-Meteorological Extremes in the Himalayan Region. In *Climate Change: Conflict and Resilience in the Age of Anthropocene* (pp. 33-56). Springer, Cham. https://doi.org/10.1007/978-3-031-85359-3_2

Delgado, T. S., McCall, M. K., & López-Binnqüist, C. (2023). Non-Timber Forest Products: Small Matters, Big Significance, and the Complexity of Reaching a Workable Definition for Sustainability. *Small-Scale Forestry, 22*(1), 37-68. https://doi.org/10.1007/s11842-022-09517-9

Doucet, T. C., Duinker, P. N., Charles, J. D., Steenberg, J. W., & Zurba, M. (2024). Characterizing Non-Governmental Organizations and Local Government Collaborations in Urban Forest Management Across Canada. *Environmental Management, 73*(1), 231-242. https://doi.org/10.1007/s00267-023-01889-8

Feng, Q., Yang, H., Liu, Y., Liu, Z., Xia, S., Wu, Z., & Zhang, Y. (2024). Interdisciplinary Perspectives on Forest Ecosystems and Climate Interplay: A Review. *Environmental Reviews, 33*, 1-21. https://doi.org/10.1139/er-2024-0010

Jackson, S., Poelzer, G., Poelzer, G., & Noble, B. (2023). Mining and Sustainability in the Circumpolar North: The Role of Government in Advancing

Corporate Social Responsibility. *Environmental Management, 72*(1), 37-52. https://doi.org/10.1007/s00267-022-01680-1

Kigenyi, R., Kalulu, R., & Rusoke, T. (2024). The Influence of Participatory Forest Monitoring on Natural Forest Management and Community Welfare: A Case Study in Kibale National Park, Western Uganda. *Journal of Global Ecology and Environment,* 20(4), 89-101. https://doi.org/10.56557/jogee/2024/v20i48914

Marthahudi, R. (2024). Analisis Kewenangan Pemerintah Daerah dalam Pengelolaan Sumber Daya Alam Berdasarkan UU Otonomi Daerah. *Indragiri Law Review, 2*(2), 80-86. https://doi.org/10.32520/ilr.v2i2.41

Mulpiyanti, M., & Rahayu, E. (2025). Implementation of Permendes PDTT Number 13 of 2023 Concerning Operational Guidelines on the Focus of Using Village Funds in 2024 in Pasanggrahan Village, Solear Sub-District, Tangerang District. *Asian Journal of Management, Entrepreneurship and Social Science, 5*(01), 149-175.

Post, A. E., & Kuipers, N. (2023). City Size and Public Service Access: Evidence from Brazil and Indonesia. *Perspectives on Politics, 21*(3), 811-830. https://doi.org/10.1017/S1537592722003176

Raihan, A. (2023). A Review on the Integrative Approach for Economic Valuation of Forest Ecosystem Services. *Journal of Environmental Science and Economics, 2*(3), 1-18. https://doi.org/10.56556/jescae.v2i3.554

Salampessy, M. L., Nugroho, B., Kartodiharjo, H., & Kusmana, C. (2024). Local Institutions Performance in Mangrove Forest Management on Small Islands: Case Study in Buano Island, Maluku Province, Indonesia. *Jurnal Sylva Lestari, 12*(2), 296-323. https://doi.org/10.23960/jsl.v12i2.840

Sreekar, R., Koh, L. P., Lamba, A., Mammides, C., Teo, H. C., Dwiputra, A., & Zeng, Y. (2024). Conservation Opportunities Through Improved Management of Recently Established Protected Areas in Southeast Asia. *Current Biology, 34*(16), 3830-3835. https://doi.org/10.1016/j.cub.2024.07.031

Suwardi, A. B., & Navia, Z. I. (2023). Sustainable Use and Management of Wild Edible Fruit Plants: A Case Study in the Ulu Masen Protected Forest, West Aceh, Indonesia. *Journal of Sustainable Forestry, 42*(8), 811-830. https://doi.org/10.1080/10549811.2022.2123355

Trihatmoko, E., Handika, R., Frederik, M. C., Sofan, P., & Wibawanti, P. (2024, December). Rapid Assessment of Economic Impacts from Inundation in Karawang, Indonesia: A Multi-Platform Geospatial Approach. In *2024 IEEE Asia-Pacific Conference on Geoscience, Electronics and Remote Sensing Technology (AGERS)* (pp. 9-15). IEEE. https://doi.org/10.1109/AGERS65212.2024.10932922

Ullah, A. (2025). Community and Institutional Drivers of Deforestation, Environmental Impacts, and Extension Interventions for Forest Management in the Hindu Kush Himalaya. *Land Degradation & Development, 36*(10), 3575-3586. https://doi.org/10.1002/ldr.5586

Ullah, A., & Bavorova, M. (2024). Livelihood Impacts of Community-Based Forest Landscape Restoration in the Hindu Kush Himalaya, Pakistan. *European Journal of Forest Research, 143*(6), 1773-1786. https://doi.org/10.1007/s10342-024-01726-5

Ullah, A., Zeb, A., Shah, A. A., & Bavorova, M. (2024). From Education to Rehabilitation: Empowering Farming Communities Through Extension Services for Landscape Restoration. *Environment, Development and Sustainability, 26*(5), 11681-11701. https://doi.org/10.1007/s10668-023-03452-1

Wei, S., Xiang, Y., & Li, Z. (2024). Balancing Conservation and Development: A Policy Framework for Sustainable Forest Management. *Journal of Selvicoltura Asean, 1*(4), 187-197.

Wulandari, C., Syahiib, A. N., Tri Astuti, P., Wahyuni, E., Bakri, S., & Kaskoyo, H. (2023). The Importance of Development Planning for the Utilization of Non-Timber Forest Products in Supporting the Sustainability of Protected Forest Area: A Case Study of Pesawaran Forest Management Units (FMU), Lampung Province, Indonesia. *International Journal of Scientific Research Updates, 5*(1), 098-106. https://doi.org/10.53430/ijsru.2023.5.1.0007

Yigitcanlar, T., David, A., Li, W., Fookes, C., Bibri, S. E., & Ye, X. (2024). Unlocking Artificial Intelligence Adoption in Local Governments: Best Practice Lessons from Real-World Implementations. *Smart Cities, 7*(4), 1576-1625. https://doi.org/10.3390/smartcities7040064

Yolamalinda, Y., Widyawati, L. F., & Istiqomah, A. (2023). Implementation of Good Forest Governance in Forest Management in Indonesia. *Jurnal Ilmiah Multidisiplin Indonesia (JIM-ID), 2*(02), 77-88. https://doi.org/10.58471/esaprom.v2i02.2248

Zhang, Y., West, P., Thakholi, L., Suryawanshi, K., Supuma, M., Straub, D., & Agyei, F. K. (2023). Governance and Conservation Effectiveness in Protected Areas and Indigenous and Locally Managed Areas. *Annual Review of Environment and Resources, 48*(1), 559-588. https://doi.org/10.1146/annurev-environ-112321-081348