



Central Sulawesi Forest Park: A Pattern of Tenure Conflict Resolution

Pria Kurnijanto^{1*}, Syamsu Rijal², Andi Mujetahid², Muhammad Dassir²

¹ Doctoral Program in Forestry Science, Faculty of Forestry, Hasanuddin University, Makassar 90245, Indonesia

² Faculty of Forestry, Hasanuddin University, Makassar 90245, Indonesia

Corresponding Author Email: priyo.kurniyanto69@gmail.com

<https://doi.org/10.18280/ijstdp.180714>

ABSTRACT

Received: 8 February 2023

Accepted: 19 May 2023

Keywords:

tenure, conflict resolution, forest park, central sulawesi

Tenurial conflicts between the community and the administration of the Central Sulawesi Forest Park area have persisted for a very long period, leading to both tangible and intangible losses. Each side presents claims and justifications for land ownership in the region. This study investigates the pattern of tenure conflict resolution in the Central Sulawesi Forest Park area, aiming to contribute to the optimal management and use of forest resources. A process hierarchical analysis utilizing a quantitative descriptive approach is employed as the study methodology. Based on the Global Priority calculation, the pattern of tenure settlement with the highest alternative weight priority is the social forestry conservation partnership, with a score of 1.17; law enforcement with a value of 0.49 and settlement of land acquisition in forest areas on land for agrarian reform objects with a value of 0.28. There are three alternatives for resolving land tenure conflicts in the Tahura Area of Central Sulawesi: 1) Social forestry with conservation partnerships, 2) Law enforcement, and 3) Settlement of land tenure in forest areas for land objects of agrarian reform.

1. INTRODUCTION

Forest resources play a crucial role in the sustenance of human life [1-3]. These resources have various components that can be employed for the economy, environment, and ecotourism [4-7]. This role is significant not only for those who reside nearby, but also for those outside the forest area [8-10].

However, the utilization dynamics of these existing forest resources frequently cause conflicts [11-13]. Various cases have been found, including illegal logging [14], hunting of wild animals [15], community conflicts with area managers [16], and land claims [17]. Such competition has also occurred in the Central Sulawesi Forest Park (TAHURA), evidenced by modifications made to the Spatial Planning Outcomes document, reducing the original size from 7,128 hectares to 5,355.59 hectares.

Conflict has arisen between the local people and the administration during the process of designating the region. These conflicts occur due to differing understandings of the forest's function between local populations and managers [18]. These differences are influenced by the local community's knowledge in interpreting forests as a source of life, based on cultural traditions and historical aspects passed down from generation to generation [19-21]. On the other hand, the managers' perspective stems from laws and regulations [22, 23].

Policies that restrict local community access have an impact on the livelihoods of those who rely on forest resources [24-27]. This situation also applies to the people in the TAHURA Central Sulawesi, leading to land tenure conflicts involving the community, reporting agencies, and other related institutions.

To resolve this issue, policies promoting land tenure in the

community are required. This research seeks to discover conflict patterns that stakeholders can use to manage the Forest Park in accordance with the principles of sustainable spatial utilization.

2. METHODS

In general, this study uses a quantitative descriptive research technique with Analytic hierarchy process (AHP) to obtain a priority regarding conflict resolution policy steps with expert judgement from the stakeholders who know about the management of TAHURA Central Sulawesi [28, 29]. The key informants in this study were Community Leaders, Tondo Sub-District, Poboya Sub-District, Layana Indah Sub-District, Lasoani Sub-District, Kawatuna Sub-District in Mantikulore District, Palu City, and Pombewe Village, Loru Village and Ngatabaru Village in Sigi Biromaru District, Sigi Regency.

Table 1. Criteria and sub-criteria of conflict resolution in Central Sulawesi Forest Park

No	Criteria	Sub-Criteria
1	Local community activities	Local agriculture
		Local plantation
2	Government authority	Local mining
		Forest park management
3	Social facilities	Worship place
		Public health center
		School
4	Public facilities	Public road
		Local Community Settlements

The interview data were analyzed, and version 11 of the Expert Choice method was applied to the resulting data. This procedure tries to determine the following steps to address the issue, and the results will be displayed using two deciding indicators: inconsistency and priority. If the data processing assessment outcome is more significant than 0.10, it is deemed inconsistent; if it is less than 0.10, it is declared consistent.

In establishing priorities for conflict resolution, there are four (four) selection criteria:

- 1) local community activities,
- 2) government authority,
- 3) social facilities,
- 4) public facilities are among them (Table 1).

3. RESULTS AND DISCUSSION

3.1 Land use on Central Sulawesi Forest Park

TAHURA Central Sulawesi has experienced significant transformations on multiple occasions, as seen by the picture variations. It is due to changes in land use resulting from the 2021 Spatial Planning Review for the Province of Central Sulawesi. Since its creation in 1999 till the present, the area has always undergone non-constant changes. The TAHURA Central Sulawesi region encompasses two administrative parts: Palu City and Sigi Regency. The 2019-2020 period for TAHURA's territory has expanded by 8.61%, as shown in

Table 2. In 2020-2021, however, the area of TAHURA has dropped by 33.31%.

Table 2. Area of Central Sulawesi Forest Park in 2019-2022

Regency/ Village/ Sub-District	Year			
	2019	2020	2021	2022
Sigi Regency				
Loru	1266.5	1249.8	1249.5	1249.5
Ngatabaru	960.84	931.30	931.3	931.3
Pombewe	211.81	211.81	211.81	211.81
Total	2439.15	2392.91	2392.61	2392.61
Palu City				
Layana Indah	331.51	479.92	331.51	331.51
Tondo	1316.9	1044.68	796.13	796.13
Poboya	1332.9	1585.68	275.12	275.12
Lasoani	585.1	1228.0	280.6	280.6
Kawatuna	1332.8	1298.8	1279.0	1279.0
Total	4899.21	5637.07	2962.36	2962.36
GRAND TOTAL	7338.36	8029.98	5354.97	5354.97

From 2019 through 2022, the TAHURA Central Sulawesi territory that falls under the jurisdiction of the Sigi Regency is not likely to undergo considerable change (Figures 1 and 2). Due to the region's steep (15%-25%) topography, there is still limited land use activity. Several communities in the Sigi Regency engage primarily in mixed types of dryland agricultural and dryland farming.

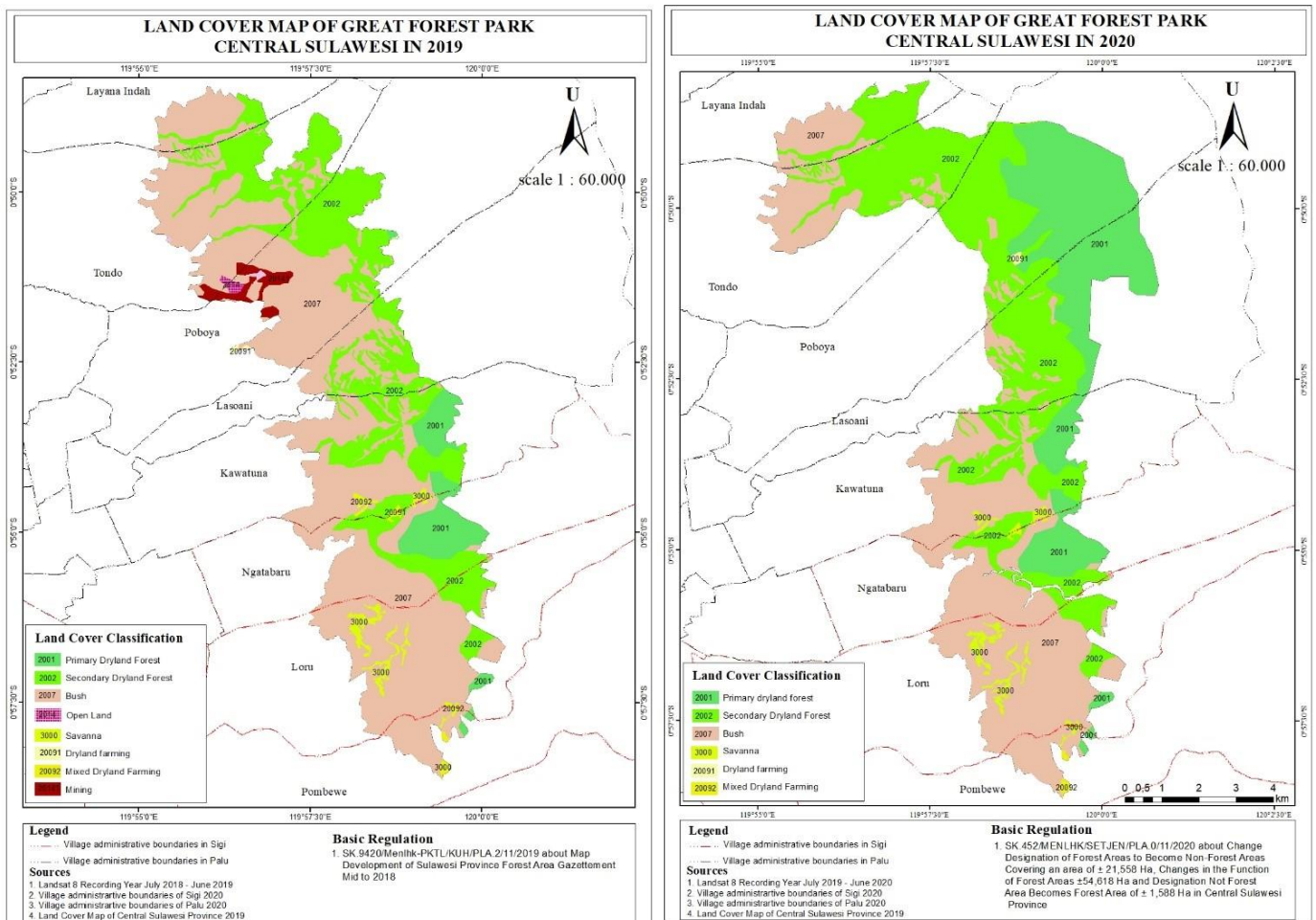


Figure 1. Map of change in the Central Sulawesi Forest Park 2019-2020

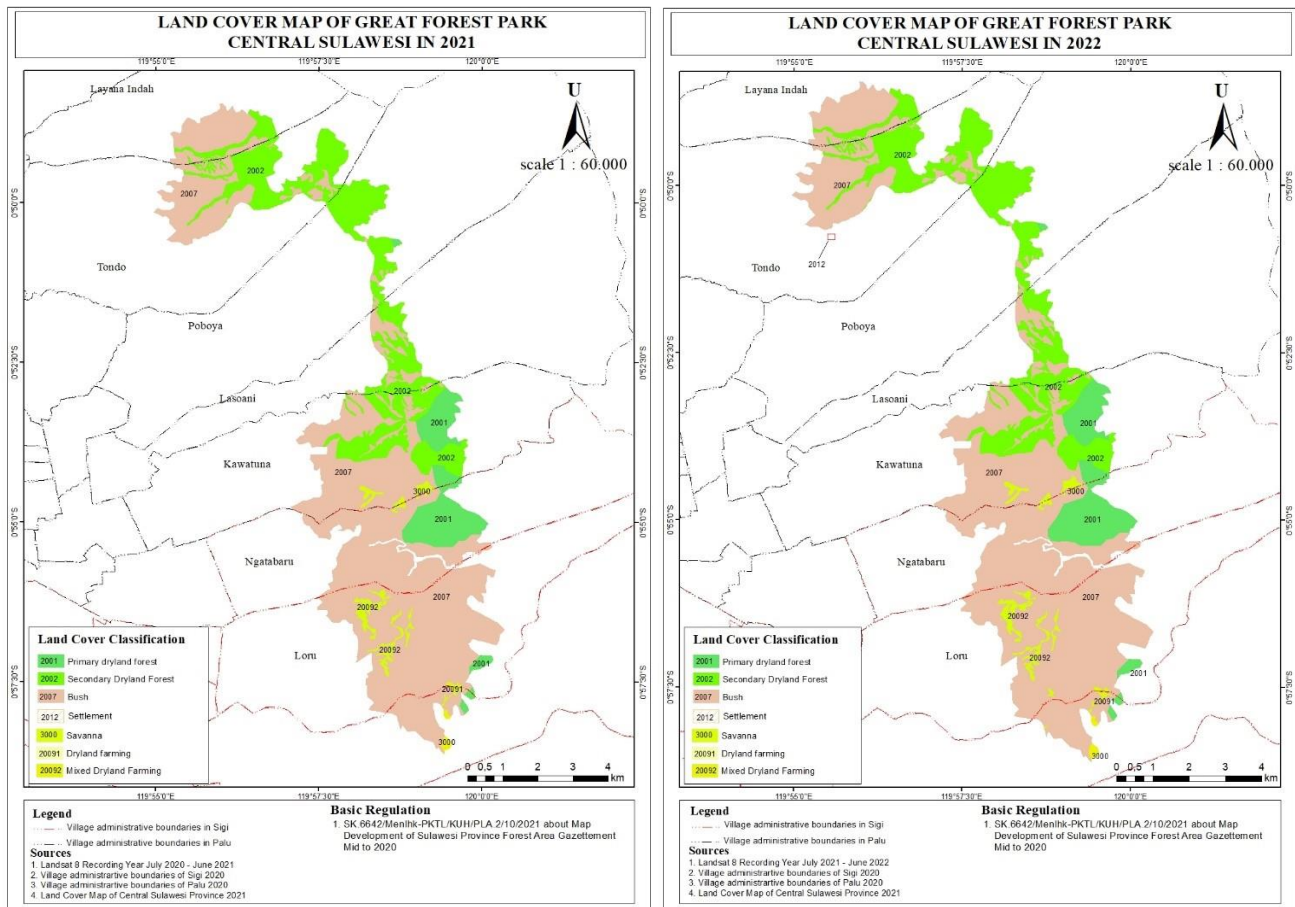


Figure 2. Map of change in the Central Sulawesi Forest Park 2021-2022

The extensive changes that have taken place in Palu City, particularly in the Tondo, Poboya, and Lasoani Villages, are pretty noteworthy. Mining, whether for gold or sand, is a community activity that reduces the area of Tahura in the Tondo Village. The site of 1044.68 ha will shrink to 796.13 ha in 2020-2021. It represents a decline of approximately 50 percent of the Tahura area in the Tondo Village. The Poboya Gold Mine illustrates a significant issue in Central Sulawesi.

Economic development will significantly enhance a region's growth [30-32]. However, this also has negative impacts, including the high demand for land [33-35]. Since land is limited, conflicts between land uses and hence, disputes between land users regarding land use inevitably arise [36, 37].

The community opened this gold mine in the context of TAHURA Central Sulawesi, resulting in diminished and damaged regional ecosystems. Since 2020-2021, the area of TAHURA has dropped from 1585.68 Ha to 275.12 Ha, or approximately 82.13% (Figures 1 and 2) in Poboya Village owing to mining activities and in Lasoani Village due to development settlement (Figures 1 and 2).

3.2 Process hierarchy analysis

The evaluation of the policy hierarchy for resolving land tenure conflicts in the TAHURA Central Sulawesi was derived from an expert choice program questionnaire analysis. Respondents included village administrators and community leaders from the region surrounding the TAHURA Central Sulawesi area. The findings of the study of criteria and subcriteria (Table 3), demonstrate that TAHURA Central Sulawesi managers are deemed highly important to be

adjusted as the leading sector in area management with a weight of 0.0383. This function allows flexibility in resolving problems that develop in the region. Even though the implementation in the field has not been optimum, the motive is carried out by management to protect the area while still paying attention to the interaction of residents with the environment.

Then there are 3 (three) policy priorities in resolving land use conflicts in TAHURA Central Sulawesi, namely:

- 1) Social Forestry with a conservation Partnership system,
- 2) Law enforcement,
- 3) Settlement of Land Tenure in Forest Areas for Agrarian Reform of Land Objects (Figure 3).

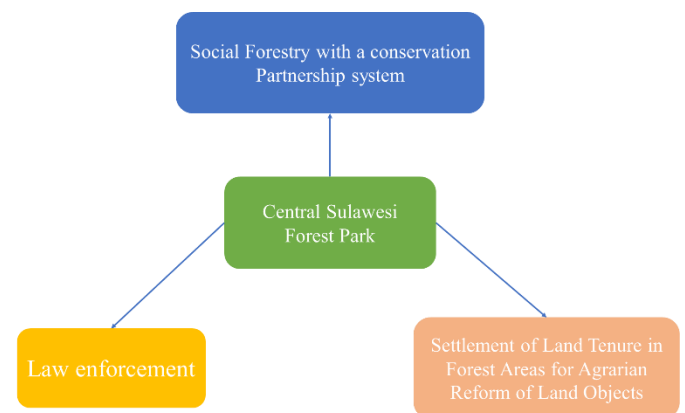


Figure 3. Conflict resolution policy priorities

Table 3. Results of weighting criteria and sub criteria

	Local Community Activities (LCA)	Government Authority (GA)	Social Facilities (SF)	Public Facilities (PF)	Total	
Local agriculture	0.09	0.10	0.07	0.076	0.0084	GA
Local plantation	0.12	0.10	0.08	0.089	0.0097	LCA
Local mining	0.09	0.07	0.06	0.050	0.0047	LCA
Central Sulawesi Forest Park	0.15	0.22	0.15	0.177	0.0383	GA
School	0.08	0.09	0.11	0.097	0.0085	PF
Worship place	0.12	0.10	0.14	0.146	0.0127	PF
Public health center	0.11	0.11	0.14	0.128	0.0134	SF
Public road	0.11	0.16	0.18	0.162	0.0245	SF
Local Community Settlements	0.11	0.06	0.07	0.076	0.0047	LCA

Table 4. Alternative conflict resolution policy prioritie

	Law Enforcement	Agrarian Reform	Social Forestry with a Conservation Partnership Scheme
Local agriculture	0.24	0.14	0.62
Local plantation	0.19	0.13	0.69
Local mining	0.26	0.14	0.6
Central Sulawesi Forest Park	0.22	0.16	0.63
School	0.36	0.16	0.48
Worship place	0.29	0.15	0.55
Public health center	0.28	0.12	0.6
Public road	0.29	0.14	0.57
Local Community Settlements	0.25	0.18	0.56
Total Criteria Weight	0.12	0.96	0.09
Total alternative Weight	0.49	0.28	1.17
Priority	II	III	I

Among the three policy priorities, the priority is resolution of land tenure conflicts the most important of the policy of land tenure conflict. The TAHURA Central Sulawesi Area receives an alternative weight value of 1.17 (Table 4) for Social Forestry with a Conservation Partnership Scheme, indicating that the surrounding community desires to collaborate on the area's management with a focus on sustainability. In priority II, Law Enforcement has a total weight of 0.49, indicating that the community does not desire conflict resolution with a law enforcement pattern. Instead, the community wants the solution to tenurial conflicts in the TAHURA Central Sulawesi Area via collaboration with the local government. At priority III, Settlement of Land Tenure in Forest Areas for Agrarian Reform of Land Objects has a total weight of 0.28, indicating that the community opposes relocating or transferring residents from the Tahura Area in Central Sulawesi.

4. CONCLUSIONS

The management of TAHURA has not been running effectively, so resource conflicts still exist. It is 3 (three) priorities based on the results of the analysis of the parties who have an interest in the area. The three are:

- 1) social forestry with a conservation partnership scheme,
- 2) law enforcement,
- 3) Settlement of Land Tenure in Forest Areas for Agrarian Reform of Land Objects.

ACKNOWLEDGMENT

We thank the TAHURA area manager for facilitating this research and the leaders in the villages where the research

samples were conducted. And also, Dr. Golar and Wahyu Syahputra Simorangkir as the academic discussion partners.

REFERENCES

- [1] Golar, G., Muis, H., Herman, A., Simorangkir, W.S. (2022). Effectiveness of community based-collaborative on forest management of the forest programme III in Central Sulawesi. In IOP Conference Series: Earth and Environmental Science, IOP Publishing, 1114(1): 012028. <https://doi.org/10.1088/1755-1315/1114/1/012028>
- [2] Golub, A., Sohngen, B., Cai, Y.Y., Kim, J., Hertel, T. (2022). Costs of forest carbon sequestration in the presence of climate change impacts. *Environmental Research Letters*, 17(10): 104011. <https://doi.org/10.1088/1748-9326/ac8ec5>
- [3] Grix, M., Watene, K. (2022). Communities and climate change: why practices and practitioners matter. *Ethics & International Affairs*, 36(2): 215-230. <https://doi.org/10.1017/S089267942200020X>
- [4] Golar, G., Mahfudz, Malik, A., Muis, H., Khairil, M., Ali, S.S.S., Razman, M.R., Awang, A. (2019). The adaptive-collaborative as a strategy communications for conflict resolution on the National Park. *Ecology, Environment and Conservation*, 25(4): 352-359.
- [5] Race, D., Suka, A.P., Irawanti, S., Oktalina, S.N., Bisjoe, A.R.H., Muin, N., Purwanti, R., Sumirat, B. (2019). Smallholder forestry: The role of commercial forestry in rural livelihoods in Indonesia. *International Forestry Review*, 21(2): 225-237. <https://doi.org/10.1505/146554819826606568>
- [6] Savath, V., Fletschner, D., Peterman, A., Santos, F.

- (2014). Land, assets, and livelihoods: Gendered analysis of evidence from Odisha state in India. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.2405717>
- [7] Achmad, A., Ngakan, P.O., Umar, A., Asrianny. (2013). Potensi keanekaragaman satwaliar untuk pengembangan ekowisata di laboratorium lapangan konservasi sumberdaya hutan dan ekowisata hutan pendidikan unhas. *Jurnal Penelitian Kehutanan Wallacea*, 2(2): 79-92. <https://doi.org/10.18330/jwallacea.2013.vol2iss2pp79-92>
- [8] Asri, Golar, Racman, I. (2018). Identifikasi potensi konflik tenurial di wilayah kesatuan pengelolaan hutan produksi (KPHP) model unit VI gorontalo. *Jurnal Warta Rimba*, 6(1):1-9.
- [9] Massiri, S.D., Malik, A., Golar, Hamzari, Nugroho, B. (2020). Institutional capacity of forest management unit in promoting sustainable community-based forest management. Case study of forest management unit in Central Sulawesi Province, Indonesia. *Jurnal Manajemen Hutan Tropika*, 26(2): 169-169. <https://doi.org/10.7226/JTFM.26.2.169>
- [10] Long, X.R., Lin, H., An, X.X., Chen, S.D., Qi, S.Y., Zhang, M. (2022). Evaluation and analysis of ecosystem service value based on land use/cover change in Dongting Lake wetland. *Ecological Indicators*, 136: 108619. <https://doi.org/10.1016/j.ecolind.2022.108619>
- [11] Ambarwati, M.E., Sasongko, G., Therik, W.M.A. (2018). Dynamics of the tenurial conflict in state forest area (case in BKPH tanggung KPH semarang). *Sodality: Jurnal Sosiologi Pedesaan*, 6(2). <https://doi.org/10.22500/sodality.v6i2.23228>
- [12] Cai, W.J., Feely, R.A., Testa, J.M., Li, M., Evans, W., Alin, S.R., Xu, Y.Y., Pelletier, G., Ahmed, A., Greeley, D.J., Newton, J.A., Bednaršek, N. (2021). Natural and anthropogenic drivers of acidification in large estuaries. *Annual Review of Marine Science*, 13: 23-55. <https://doi.org/10.1146/annurev-marine-010419-011004>
- [13] Rudel, T.K. (2021). Indigenous-driven sustainability initiatives in mountainous regions: the shuar in the Tropical Andes of Ecuador. *Mountain Research and Development*, 41(1): R22-R28. <https://doi.org/10.1659/MRD-JOURNAL-D-20-00039.1>
- [14] Kleinschmit, D., Mansourian, S., Wildburger, C., Purret, A. (2016). Illegal logging and related timber trade-dimensions, drivers, impacts and responses. A global scientific rapid response assessment report. *International Union of Forestry Research Organizations (IUFRO)*, 35.
- [15] Ehrhart, S., Schraml, U. (2018). Adaptive co-management of conservation conflicts-an interactional experiment in the context of German national parks. *Heliyon*, 4(10): e00890. <https://doi.org/10.1016/j.heliyon.2018.e00890>
- [16] Ordóñez, C., Kendal, D., Threlfall, C.G., Hochuli, D.F., Davern, M., Fuller, R.A., van der Ree, R., Livesley, S.J. (2020). How urban forest managers evaluate management and governance challenges in their decision-making. *Forests*, 11(9): 963. <https://doi.org/10.3390/f11090963>
- [17] Schneider, F., Feurer, M., Lundsgaard-Hansen, L.M., Myint, W., Nuam, C.D., Nydegger, K., Oberlack, C., Tun, N.N., Zähringer, J.G., Tun, A.M., Messerli, P. (2020). Sustainable development under competing claims on land: Three pathways between land-use changes, ecosystem services and human well-being. *The European Journal of Development Research*, 32: 316-337. <https://doi.org/10.1057/s41287-020-00268-x>
- [18] Golar, G., Muis, H., Akhbar, A., Khaeruddin, C. (2022). Threat of forest degradation in ex-forest concession right (HPH) in Indonesia. *Sustainability and Climate Change*, 15(3): 216-223. <https://doi.org/10.1089/scc.2022.0019>
- [19] Davis, S.H. (2010). Indigenous peoples and climate change. *International Indigenous Policy Journal*, 1(1). <https://doi.org/10.18584/iipj.2010.1.1.2>
- [20] Dockry, M.J. (2020). Indigenous rights and empowerment in natural resource management and decision making as a driver of change in U.S. forestry. In Dockry, Michael, J., Bengston, David, N., Westphal, Lynne, M., comps. *Drivers of change in U.S. forests and forestry over the next 20 years*, Forest Service U.S. Department of Agriculture, 20: 76-83. <https://doi.org/10.2737/NRS-GTR-P-197-paper8>
- [21] Pincetl, S., Kennedy, S. (2022). Environmental protection, climate regulation, and the persistence of sprawl in California. *GeoJournal*, 87(5): 3877-3894. <https://doi.org/10.1007/s10708-021-10458-7>
- [22] Maczka, K., Matczak, P., Jeran, A., Chmielewski, P.J., Baker, S. (2021). Conflicts in ecosystem services management: analysis of stakeholder participation in natura 2000 in Poland. *Environmental Science & Policy*, 117: 16-24. <https://doi.org/10.1016/j.envsci.2021.01.001>
- [23] Sahide, M.A.K., Supratman, S., Maryudi, A., Kim, Y.S., Giessen, L. (2016). Decentralisation policy as recentralisation strategy: forest management units and community forestry in Indonesia. *International Forestry Review*, 18(1): 78-95. <https://doi.org/10.1505/146554816818206168>
- [24] Golar, G., Malik, A., Muis, H., Herman, A., Nurudin, N., Lukman, L. (2020). The social-economic impact of COVID-19 pandemic: Implications for potential forest degradation. *Heliyon*, 6(10): e05354. <https://doi.org/10.1016/j.heliyon.2020.e05354>
- [25] Golar, G., Muis, H., Massiri, S.D., Rahman, A., Maiwa, A., Pratama, F., Baharuddin, R.F., Simorangkir, W.S. (2021). Can Forest Management Units Improve Community Access to the Forest? *International Journal of Design & Nature and Ecodynamics*, 16(5): 565-571. <https://doi.org/10.18280/ijdne.160511>
- [26] Rukminda, G.M., Soekmadi, R., Adiwibowo, S. (2020). Perspektif masyarakat terhadap program kemitraan kehutanan sebagai solusi konflik tenurial di kesatuan pengelolaan hutan lindung Rinjani Barat. *Media Konservasi*, 25(1): 17-25. <https://doi.org/10.29244/medkon.25.1.17-25>
- [27] Turner, N.J., Cuerrier, A., Joseph, L. (2022). Well grounded: indigenous peoples' knowledge, ethnobiology and sustainability. *People and Nature*, 4(3): 627-651. <https://doi.org/10.1002/pan3.10321>
- [28] Hu, H.R., Zhu, B.K., Guo, J. (2020). Natural gas pipeline leakage analysis based on Advance risk analysis and Analytic hierarchy process. In *IOP Conference Series: Earth and Environmental Science*, IOP Publishing, 565(1): 012019. <https://doi.org/10.1088/1755-1315/565/1/012019>
- [29] Bachtiar, A.S.A., Nurwatic, (2023). Alternative route planning analysis of tourism transport using analytical hierarchy process (AHP) and network analysis methods (case study: Jember regency). In *IOP Conference Series: Earth and Environmental Science*, IOP Publishing,

- 1127(1): 012046. <https://doi.org/10.1088/1755-1315/1127/1/012046>
- [30] Vardhan, V., Kamala, R., Das, A.K., Sharma, A., Allen, J.K., Mistree, F. (2022). A method for social entrepreneurs to develop value propositions for sustainable development. *International Journal of Sustainable Development and Planning*, 17(8): 2347-2356. <https://doi.org/10.18280/ijmdp.170801>
- [31] Jaunky, V.C., Lundmark, R. (2016). Forest products exports and economic growth: evidence from rich countries. *The Journal of Developing Areas*, 50(4): 443-458. <https://doi.org/10.1353/jda.2016.0173>
- [32] Dangwal, A., Taneja, S., Özen, E., Todorovic, I., Grima, S. (2022). Abridgement of renewables: It's potential and contribution to India's GDP. *International Journal of Sustainable Development and Planning*, 17(8): 2357-2363. <https://doi.org/10.18280/ijmdp.170802>
- [33] Dong, G.L., Ge, Y.B., Jia, H.W., Sun, C.Z., Pan, S.Y. (2021). Land use multi-suitability, land resource scarcity and diversity of human needs: A new framework for land use conflict identification. *Land*, 10(10): 1003. <https://doi.org/10.3390/land10101003>
- [34] Fienitz, M., Siebert, R. (2022). "It is a total drama": Land use conflicts in local land use actors' experience. *Land*, 11(5): 602. <https://doi.org/10.3390/land11050602>
- [35] Soukhovolsky, V., Ivanova, Y. (2020). "Economic" forest growth models: the impact of phytomass removal. In *IOP Conference Series: Materials Science and Engineering*, IOP Publishing, 734(1): 012088. <https://doi.org/10.1088/1757-899X/734/1/012088>
- [36] Golar, G., Basir-Cyio, M., Isrun, I., Bakri, R., Rusydi, M., Bohari, B., Pratama, M.F. (2021). Recovery of agricultural areas affected by traditional gold mining: sustainable food supply stability. *International Journal of Design & Nature and Ecodynamics*, 16(2): 177-184. <https://doi.org/10.18280/ijdne.160207>
- [37] van Teijlingen, K. (2022). The 'church of the poor and the Earth' in Latin American Mining Conflicts. *Religions*, 13(5): 443. <https://doi.org/10.3390/rel13050443>