

Community Interactions Ngablak Village in Sand Utilization within Mount Merapi National Park

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ABSTRAK

Interaksi masyarakat dengan Taman Nasional Gunung Merapi sudah ada bahkan jauh sebelum taman nasional ditetapkan. Salah satu bentuk interaksi yang masih dilakukan oleh masyarakat adalah pemanfaatan pasir di kawasan Kali Putih. Tujuan penelitian ini adalah mengetahui interaksi masyarakat sekitar Taman Nasional Gunung Merapi dalam pemanfaatan pasir di kawasan Kali Putih Zona Khusus Rekonstruksi dan Mitigasi. Metode penelitian yang digunakan pada penelitian ini adalah metode survei. Wawancara dilakukan langsung dengan masyarakat yang melakukan aktivitas di kawasan Kali Putih, Zona Khusus Mitigasi dan Rekonstruksi Taman Nasional Gunung Merapi. Penentuan informan dilakukan dengan *accidental sampling* dimana informan ditentukan secara kebetulan di lapangan saat melakukan aktivitas pemanfaatan sumber daya pasir di kawasan Kali Putih. Hasil wawancara kemudian diolah menggunakan analisis deskriptif kualitatif. Berdasarkan hasil pengambilan informasi di lapangan, didapatkan beberapa informasi diantaranya aktivitas penambangan pasir sudah dilakukan pada tahun 1977. Interaksi masyarakat dalam pemanfaatan pasir di Kali Putih dipayungi hukum berupa kemitraan kawasan konservasi dengan dokumen PKS Nomor : PKS.34/BTNGM/TU/Kons/04/2018 dan 08/PMH/04/2018 Tentang Penguatan Fungsi Kawasan Taman Nasional Gunung Merapi Melalui Kerja Sama Pemberdayaan Masyarakat. Ketergantungan masyarakat sekitar akan pemanfaatan sumber daya pasir masih sangat tinggi. Selain pemanfaatan pasir, masyarakat juga melakukan aktivitas dalam mendukung pengelolaan Taman Nasional Gunung Merapi yaitu : patroli bersama petugas TNGM, penanaman di kawasan TNGM, dan terlibat dalam pemadaman kebakaran hutan dan pengembangan Obyek Wisata Alam (OWA) Jurang Jero.

Keywords: Interaksi, Persepsi, Pemanfaatan, Taman Nasional

ABSTRACT

Community interaction with Mount Merapi National Park existed long before the national park was established. One form of interaction that is still carried out by the community Ngablak Village is the utilization of sand in the Kali Putih area. The aim of this study was to determine the interaction of the community Ngablak Village in the utilization of sand in the Kali Putih area, the Special Reconstruction and Mitigation Zone. The research method used in this research was a survey method. Interviews were conducted directly with communities carrying out activities in the Kali Putih area, the Special Zone for Mitigation and Reconstruction of Mount Merapi National Park. The determination of informants was carried out by accidental sampling where the informants were determined by chance in the field while carrying out activities to exploit sand resources in the Kali Putih area. The results of the interviews were then processed using qualitative descriptive analysis. Based on the results of information retrieval in the field, some information was obtained including sand utilization activities that were carried out in 1977. Community interaction in the use of sand in Kali Putih is legally protected in the form of a conservation area partnership with the PKS document Number: PKS.34 / BTNGM / TU / Kons / 04 / 2018 and 08 / PMH / 04/2018 concerning Strengthening the Function of the Mount Merapi National Park Area through Community Empowerment Cooperation. The dependence of the surrounding community on the utilization of sand resources is still very high. In addition to the utilization of sand, the community also carries out activities in supporting the management of Mount Merapi National Park, namely: patrolling with MMNP officers, planting in the MMNP area, and being involved in extinguishing forest fires and developing the Jurang Jero Nature Tourism Object.

Keywords: Interaction, Perception, Utilization, National Park

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1. Background

Mount Merapi National Park (MMNP) is a very unique conservation area. MMNP has the main function as a buffer for the most active volcanoes in Indonesia, which has experienced various eruptive events in its history (Wijayati & Rijanta, 2011). The history of the establishment of MMNP cannot be separated from the conflict with the community. Until now, the occurred eruptions have produced a pile of sand in Kali Putih and become a source of conflict between the community, MMNP, and other related parties (Sulaksono & Hadiyan, 2015). If managers do not involve communities around forest areas in forest resource management, the problem of land conflicts will not be resolved (Novalanty et al., 2016).

Various solutions have been carried out in the middle of conflict resolution, including the conservation partnership mechanism between the Mount Merapi National Park Center and the people who utilize the sand in Kali Putih, Mount Merapi National Park, which is under the auspices of the Pagutuban Merapi Hijau. Cooperation Agreement made with PKS Number: PKS.34/BTNGM/TU/Kons/04/2018 and 08/PMH/04/2018 concerning Strengthening the Function of the Mount Merapi National Park Area through Community Empowerment Cooperation. The scope of activities of the association includes empowering the surrounding community to be involved in tourism activities, restoring the ecosystem through restoration and rehabilitation activities, and securing and protecting the area from natural resources through the transfer of volcanic material from the Mount Merapi National Park area while maintaining the traditional way. So far, community welfare and forest preservation have been the main achievements in the management of forest resources in conservation areas. The community is directed to shift to the tourism sector because natural tourism in National Parks has become a new trend of traveling around the world (Heagney et al., 2019).

Community and forest areas are unseparated things, people become part of the ecosystem that always reciprocate with the surrounding environment. Society and the environment interact directly in a system to meet their needs (Susanto et al., 2020). Society has cumulative knowledge and beliefs that are passed down from generation to generation through cultural transmission, as well as the relationship of living things (including humans) to each other and the environment (Sinthumule & Mashau, 2020). Local community knowledge has a very important role in biodiversity conservation in the management of national parks (Susanti & Zuhud, 2019). The community within Mount Merapi National Park has a very strong interaction because the community has carried out activities in the area, even before the MMNP area was established, namely in 1977. In managing MMNP, a comprehensive strategy is needed to improve community welfare and the quality of human life in

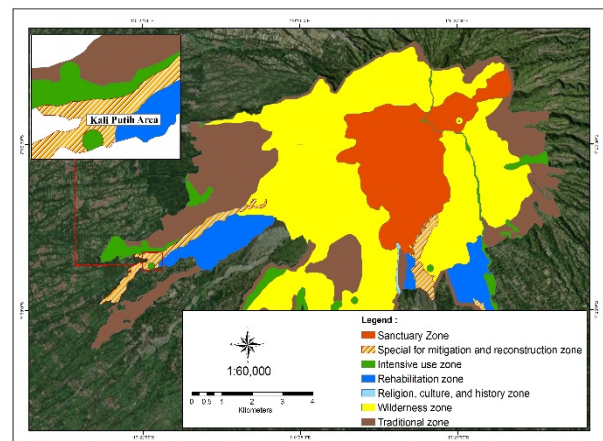
Mount Merapi National Park. (Pratidina & Rahmawati, 2015).

The interaction between the community and the Mount Merapi National Park in the utilization of sand is currently under the auspices of the cooperation between the two parties. There are 1,122 members of Paguyuban Merapi Hijau (PMH), all of whom come from Ngargosoko Village, Mranggen Village, Tegalrandu Village, and Srumbung Village, Srumbung District, Magelang Regency. From all members, the exploitation of the Kali Putih area is about 200 m - 300 m to the north and has been divided into several blocks fairly in the process of extracting sand. Direct community involvement under legal legalization will make people take part in protecting the area because they consider Kali Putih as a source of community income. So that the social aspect of the community is one of the important efforts in determining the success of forest area management (Rhaki et al., 2020). The direct interaction of the community with the National Park can be carried out in several zones, namely the utilization zone, traditional zone and Special for Mitigation and Reconstruction Zone. The use of natural resources by the Ngablak Village community has been going on for a long time, even before MMNP was established. The continuous use of sand resources by the community will be a threat to the sustainability of the MMNP forest (Bakti & Dodik, 2007). This study aims to determine the interaction of the community around Mount Merapi National Park in the utilization of sand at Kali Putih Area in Mount Merapi National Park.

2. Method

2.1. Location and Time of Research

This research was conducted at the Kali Putih area, the Special for Mitigation and Reconstruction Zone of the Mount Merapi National Park (Figure 1). Data collection was carried out between April - June 2020, while data analysis was carried out in August 2020.



Gambar 1. Map of Research Location in Kali Putih within Mount Merapi National Park

2.2. Research Design

Materials and tools used in this study include interview guides, GPS, writing instruments, voice recorders, and cameras. This research was conducted using a survey method, namely direct interviews with people who carry out activities in the Kali Putih area, the Special Zone for Mitigation and Reconstruction of the Mount Merapi National Park. Determination of informants was carried out by accidental sampling where informants were determined by chance in the field according to the research objectives (Sugiyono, 2020). The informants in question are the community who take sand resources in the Kali Putih area of MMNP. In addition, interviews were also conducted with the community who know the history of sand management in Kali Putih and the MMNP manager. The community was interviewed when using sand resources in the Kali Putih area.

2.4. Data Analysis

The data analysis used in this research is descriptive qualitative. The interview data will then be reduced to produce information that can be used in accordance with the research objectives. Information based on the analysis of informant interviews includes socio-economic conditions, history of sand management in MMNP, community dependence on sand resources in MMNP, and community expectations for the future. The results of the analysis were then strengthened by field observations and literature studies conducted by researchers, so that the data analyzed became valid.

3. Results and Discussion

3.1. Utilization of sand by the community

Since the Mount Merapi forest area has not been designated a national park, intensive interactions have occurred between humans and the forest (TNGM, 2017). In 2015, the MMNP Center established 30 villages that are directly adjacent to the MMNP area and depending on their livelihoods from natural resources in the area as buffer villages. The 2017 MMNP Community Empowerment Master Plan notes that the type of interaction of residents with Mount Merapi National Park has been going on for a long time, is the utilization of sand. Currently, at least 35 hamlets in 18 buffer villages carry out sand utilization activities both inside the MMNP area (11 hamlets), outside the MMNP area (30 hamlets), as well as inside and outside the MMNP area (6 hamlets). Specifically, for the Kali Putih watershed, the villages whose people have the highest intensive interaction in the use of sand include Ngablak Village, Tegalrandu Village, Mranggen Village, and Ngargosoko Village, all of which are located in the Magelang Regency area. The people of these villages have a long history of exploiting sand. In general, community interactions with forest areas are aimed at meeting the economic needs of communities around

forests (Kristin et al., 2018). The interaction of communities with forest areas in fulfilling their needs can lead to exploitative activities. So, it is necessary to know factors that influence the community in exploiting the forest in an effort to preserve the forest area (Nugroho et al., 2008).

The historical portrait of Merapi forest management has not only started since the designation of the Merapi forest area to become the Mount Merapi National Park in 2004 but can be traced from the changes in the previous forest management model. In 1912, several farming areas owned by residents on the southern slope of Merapi began to be confirmed by the Dutch colonial government as protected forest areas (Pranowo, 1985). The inauguration of this status is intended to reduce flooding and soil erosion caused by the shifting cultivation system, which can bring disaster to urban areas such as Yogyakarta, Surakarta, and Magelang. Sudiro (2015) states that the main cause of social tensions in the utilization of sand in Kali Putih, which is still ongoing today, is because the interests of the people using sand, supported by the economic interests of the private sector, conflict with the conservation interests of MMNP managers. One of the manifestations of this social tension occurred in 2014 when the MMNP Center closed access to Kali Putih in the Mount Merapi National Park, where a location is also a place for people to carry out sand exploitation led to resistance from the community. This was confirmed by MMNP management and the community. According to the MMNP Forestry Extension Officer, this was done to obtain a mutual agreement regarding the use of sand in Kali Putih. Local agreements had been drawn up, but in practice, there were several violations by the community so that access was closed again. The opening and closing of the access were repeated up to three times.

To overcome the problem of violations by the community and support active community involvement in monitoring and facilitate monitoring and evaluation of the use of sand by the community, the MMNP Center then encourages the community to form community groups with members of the community using sand originating from the national park buffer zone through the SABO DAM maintenance scheme. Policies that benefit the community will have a positive impact on forests, and vice versa (Siburian, 2004).

The results of the field observations showed that until the recent time there are approximately 50 (fifty) units of trucks belonging to the community that are members of PMH carrying out manual sand utilization activities daily with the number of workers that can be included as many as 5 - 7 people on each truck. The gross income per unit of a truck per day is IDR 900,000 including IDR 450,000 is the wage for the workers. The fee that is managed by the PMH group for each truck unit is IDR 20,000 for each transportation. The allocation of the contribution funds includes 25% for supporting nature conservation activities, 30% for village treasury, 25% for PMH organization operations,

and 20% for social interests. The form of nature conservation activities by PMH is to provide support for conservation activities, especially the management of the MMNP area. These activities are in the form of security patrols with MMNP officers, planting trees in the MMNP area, prevention and handling of forest fires, and the development of Jurang Jero natural tourism. Activities of utilizing sand by the community through the PMH group are carried out in river channels from PUD-5 to Cawang. There is another positive thing after the formation of PMH, namely that on Saturday-Sunday is agreed as a holiday for sand exploitation to provide opportunities for natural tourism activities and other social activities in the village. Based on the explanation of the head of the area 1 management section TNGM, there are several agreements between the community and TNGM, namely the time not to mine. This will give nature time to recover. This statement was also supported by the head of the Center for Research and Development of Geological Disaster Technology, that the direction of the Merapi eruption no longer leads to the white river. Thus, excessive utilization will more quickly damage the environment. Area preservation efforts in the management of conservation programs can be carried out optimally by increasing community participation (Sawaki et al., 2019).

Based of the results of interviews, the community understands that the utilization of sand in the Kali Putih channel is highly dependent on the supply of volcanic material from the summit of Mount Merapi. The character of the dynamic volcanic activity of Mount Merapi is used as a consideration for the community to create alternative sources of income apart from utilizing sand in the Kali Putih channel. One alternative activity that has already started is the development of Jurang Jero natural tourism. The Jurang Jero natural tourism development activity is an alternative economic effort for the community to release their dependence on the use of sand.

Based on volcanological physical appearance, the shift in the opening of the crater mouth of Mount Merapi since the 2010 eruption has implications for the possibility that the river channel that they have utilized the sand for will no longer receive volcanic material in the long term. This causes the availability of sand in the Kali Putih channel to be limited in the long term so that the people have to start thinking about alternative livelihoods for the future. The local culture of the community in utilizing natural resources including sand manually must be maintained, if exploitation on a large scale is carried out there will no longer natural resources available, damaged land and forests, and many dead springs (Siswadi et al., 2012).



Figure 2. Activities of sand extraction in Kali Putih within Mount Merapi National Park by the local community

The village community is ready with a sand management plan in Kali Putih. Several villages stated that they were ready to form Village-Owned Enterprises (BUMDES) consisting of 4 (four) villages, namely (Ngargosoko Village, Tegalrandu Village, Mranggen Village, and Ngablak Village), so that they could manage sand resources optimally. Apart from sand, the BUMDES that is being formed is also ready to utilize the *bantak* (stones) that have disturbed the community's manual sand collection, which will later be processed on-site into gravel or sand using a stone crusher. The initiative to merge BUMDES in the four villages previously did not only shows the development and strengthening of village economic institutions which were quite massive, but also showed great potential for strengthening social capital through networks that would simultaneously shape operational norms along with the provisions of sanctions. Based on the explanation from the Chairperson of Paguyuban Merapi Hijau, the merger of BUMDES in the four villages is a hope that the use of sand in the Kali Putih channel is prioritized for local communities with a manual utilization system. The BUMDES that is formed will provide benefits for village income and improve the welfare of village communities (Dewi, 2014).

3.2. Community involvement in MMNP management activities

The existence of a special mitigation and reconstruction zone allows the community to legally access sand in Kali Putih with the conservation partnership cooperation mechanism with MMNP that has been running until now. The partnership scheme allows the community to manage sand with restrictions not to carry out illegal actions such as logging and extracting forest resources such as timber. In addition to sand extraction activities, currently, the surrounding communities that are part of the conservation partnership are now starting to shift to pursue the tourism sector in the Jurang Jero Block. The Jurang Jero Tourism is a manifestation of the collaboration between the community around Mount Merapi National Park and the Mount Merapi National Park Center. Currently, the development of the tourism sector is going towards conservation areas (Matondang et al., 2017). This collaboration has a positive impact on all parties, such as in making facilities and infrastructure where the community gets assistance from the MMNP manager. Currently, the income from tourism cannot be compared to sand extraction, because it is still in the stage of pioneering at the Jurang Jero tour. PMH has done several things as a form of in-kind contribution to the MMNP area, namely: patrolling with MMNP officers, planting in the MMNP area, and being involved in forest fire suppression and the development of the Jurang Jero Nature Tourism Object.

The Jurang Jero Asri Forest Farmers Group is a pioneer group in the Jurang Jero Village from

Ngargosoko Village and the Randu Ijo Forest Farmers Group from Tegalrandu Village. The main activities of these two farmer groups are in the field of reforestation. In addition, the activities of these two groups are social in nature by helping MMNP to support area management, thus forming a partnership between the community and the managers of Mount Merapi National Park. The development of activity ideas is not only to assist the management of MMNP, but also in the development of tourism in Jurang Jero which will later support the communities in these two villages. Tourism development will consistently contribute to environmental conservation, cultural revitalization and the livelihoods of local communities in developing countries (Wondirad et al., 2020). The beginning of community activities to arranging the Jurang Jero area to become a tourist area are in 2015-2016. Because there are two Forest Farmer Groups (KTH) in one tourism development forum, a group unification is carried out into a Tourism Group (POKWIS). A process is needed to shift the work of the community from managing sand to managing tourism, one of which is by structuring the utilization zone in the Jurang Jero so that it can be utilized by villagers (Ngargosoko, Tegalrandu, Mranggen, and Ngablak Villages). Tourism is a good alternative for the community, who initially struggled to take sand to become tour operators (guides, stalls, tour packages, etc.).

Apart from managing tourism, other activities of the community in the Jurang Jero area are the agriculture, cultivation, and livestock sectors. Currently, farmers who take part in taking sand usually have a patchwork motivation at waiting period for the harvest season to arrive. There are about 10% of the total community who are members of PMH who work as farmers. As an effort to minimize the negative impact of community activities in forest areas, it is necessary to take anticipatory measures. These actions include: fulfilled local community rights, effective conflict management, adequate funding, and capacity building of forest communities (Agbogini et al., 2007). In the era of modern forest management, the community must be placed as the subject of management, where the active role of the community is very much needed for sustainable forest management. Mount Merapi National Park is presented as a provider of resources that are expected to support the economy of the local community. Forest management with the community is an effort to maintain forest sustainability. Community interactions and activities carried out in Mount Merapi National Park are expected not only to provide socio-economic benefits but also to conserve the TNMM area (Charnley & Poe, 2007).

4. Conclusion

Based on the results of the study, it can be concluded that the community has a high economic

dependence on the use of sand in the Kali Putih Special Zone for Mitigation and Reconstruction of MMNP the type of community interaction in the use of sand in the Mount Merapi National Park area is limited exploitative. Where the community directly takes sand resources manually. Community interaction in the use of sand in Kali Putih is legally protected in the form of a conservation area partnership with the PKS document Number: PKS.34/BTNGM/TU/Kons/04/2018 and 08/PMH/04/2018 concerning Strengthening the Function of the Mount Merapi National Park Area through Community Empowerment Cooperation. Other forms of interaction include patrolling with MMNP officers, planting in the MMNP area, and being involved in extinguishing forest fires and developing the Jurang Jero Nature Tourism Object.

DAFTAR PUSTAKA

- Agbogini, O. M., Ofuoku, A. U., & Dolor, D. E. 2007. Role of community Forestry in sustainable forest Management and Development: a Review. *ASSET:An International Journal (Series A)*, 7(1), 44-54. http://journal.unaab.edu.ng/index.php/Series_A/article/view/6
- Bakti, A., & Dodik, R. 2007. Pemanfaatan Sumberdaya Hutan oleh Masyarakat di KPH Banyuwangi Utara. *Jurnal Manajemen Hutan Tropika*, 13(3), 172-181.
- Charnley, S., & Poe, M. R. 2007. Community forestry in theory and practice: Where are we now? *Annual Review of Anthropology*, 36(December), 301-336. <https://doi.org/10.1146/annurev.anthro.35.081705.123143>
- Heagney, E. C., Rose, J. M., Ardeshiri, A., & Kovac, M. 2019. Land Use Policy The economic value of tourism and recreation across a large protected area network. *Land Use Policy*, 88(July), 104084. <https://doi.org/10.1016/j.landusepol.2019.104084>
- Kristin, Y., Qurniati, R., & Kaskoyo, H. 2018. Interaksi Masyarakat sekitar Hutan terhadap Pemanfaatan Lahan Taman Hutan Raya Wan Abdul Rachman. *Jurnal Sylva Lestari*, 6(3), 1-8.
- Matondang, M. A., Bahruni., & Harmawan, R. 2017. Pengaruh Tingkat Kepuasan Pengunjung Terhadap Willingness To Pay di Plerangkungan Taman Nasional Alas Purwo. *Media Konservasi*, 22(2), 164-170.
- Novalanty, D., Daulay, O., & Hidayat, J. W. 2016. Persepsi Masyarakat terhadap Pengelolaan Taman Nasional Batang Gadis, Kabupaten Mandailing Natal, Provinsi Sumatera Utara. *Proceeding Biology Education Conference (Oktober 2017)*, 14(1), 233-240.
- Nugroho, B. T. A., Undaharta, N. K. E., & Siregar, M. 2008. Interaction between the society around forest area with the use of biodiversity in the natural forest ecosystem of Bedugul-Pancasari, Bali. *Biodiversitas Journal of Biological Diversity*, 9(3), 227-231. <https://doi.org/10.13057/biodiv/d090316>
- Pratidina, G., & Rahmawati, R. 2015. Strategi Balai Taman Nasional Gunung Merapi Dalam Upaya Konservasi Sumber Daya Hutan Pasca Erupsi 2010 Merapi Mountain Forest Conservation Strategy of National Park Association Post 2010 Eruption. 6(April).
- Rhaki, M., Kaho, L. M. R., & Konradus, B. 2020. Kajian

- Terhadap Kondisi Sosial, Ekonomi dan Budaya Masyarakat dalam Mendukung Pengelolaan Cagar Alam Ndeta Kelikima di Kabupaten Ende Provinsi Nusa Tenggara Timur. *Jurnal Ilmu Lingkungan*, 18(3), 424-435. <https://doi.org/10.14710/jil.18.3.424-435>
- Sawaki, A., Wambrauw, L. T., & Sinery, A. S. 2019. Partisipasi Masyarakat Dalam Pengelolaan Taman Wisata Alam Gunung Meja Di Kabupaten Manokwari (Studi Kasus Kampung Ayambori). *Cassowary*, 2(1), 18-29. <https://doi.org/10.30862/cassowary.cs.v2.i1.19>
- Siburian, R. 2004. Kebijakan Kehutanan dan Akibatnya bagi Masyarakat Lokal. *Jurnal Masyarakat Dan Budaya*, VI(1), 121-136.
- Sinthumule, N.I, & Mashau, M.L. (2020). Traditional Ecological Knowledge and Practices for Forest Conservation in Thathe Vondo in Limpopo Province, South Africa. *Global Ecology and Conservation*, 22:e00910. doi /10.1016/j.gecco.2020.e00910.
- Siswadi, S., Taruna, T., & Purnaweni, H. 2012. KEARIFAN LOKAL DALAM MELESTARIKAN MATA AIR (Studi Kasus di Desa Purwogondo, Kecamatan Boja, Kabupaten Kendal). *Jurnal Ilmu Lingkungan*, 9(2), 63. <https://doi.org/10.14710/jil.9.2.63-68>
- Sri, A., & Dewi, K. 2014. Sebagai Upaya Dalam Meningkatkan Pendapatan Asli Desa (PADes) Serta Menumbuhkan Perekonomian Desa. V(1), 1-14.
- Sudiro, N, M, D. 2015. Kajian Konflik Penambangan Pasir di Taman Nasional Gunung Merapi (Jurang Jero Kab. Magelang Provinsi Jawa Tengah) Pasca Erupsi 2010. Tesis. Program Studi Ketahanan 98 Nasional. Minat Studi Magister Perdamaian dan Resolusi Konflik. Sekolah Pascasarjana. Universitas Gadjah Mada.
- Sugiyono. 2020. *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Sulaksono, N., & Hadiyan. 2015. Strategi resolusi konflik ekosistem kawasan Taman Nasional Gunung Merapi: Pelajaran dari Jurang Jero. *Prosiding Seminar Nasional Biodiversitas Indonesia (September 2015)*, 1(6), 1370-1374. <https://doi.org/10.13057/psnmbi/m010618>
- Susanti, R., & Zuhud, E.A.M. 2019. Traditional Ecological Knowledge and Biodiversity Conservation: The Medicinal Plants of the Dayak Krayan People in Kayan Mentarang National Park, Indonesia. *Biodiversitas*, 20(9), 64-79.
- Susanto, D., Faida, L. R. W., Lubis, F. R. H., & Hanisaputra, R. 2020. Interaksi Masyarakat Sekitar Dengan Kawasan Cagar Alam Dan Cagar Alam Laut Pangandaran. *Jurnal Belantara*, 3(2), 97-104. <https://doi.org/10.29303/jbl.v3i2.474>
- Wijayati, D., & Rijanta, R. 2011. Evaluasi Zonasi Taman Nasional Gunung Merapi. *Jurnal Litbang Sukowati*, 3(2), 1-15.
- Wondirad, A., Tolkach, D., & King, B. 2020. Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries. *Tourism Management*, 78(November 2019), 104024. <https://doi.org/10.1016/j.tourman.2019.104024>