



Preventive Measures for Peatland Forest Fires in Kumpeh Subdistrict, Muaro Jambi Regency

^{1*)} Edison, ²⁾ Ratnawati Siata, ³⁾ Dewi Sri Nurchaini

^{1,2,3)} Department of Agribusiness, Universitas Jambi, Jambi, Indonesia

*Corresponding E-mail: ediedison950@gmail.com

DOI:

10.22437/jkam.v7i2.6062

Article History:

Received:

24/12/2018

Revised:

05/10/2023

Accepted:

30/12/2023

ABSTRACT

Forest and peatland fires remain a significant threat in Kumpeh Subdistrict, Muaro Jambi Regency. This community engagement program aimed to enhance local capacity in fire prevention through training and assistance in the use of appropriate technology. The program was implemented in four stages: education, field visits, hands-on practice, and field consultation, targeting communities in Seponjen and Tanjung villages. The introduced technology integrated environmentally friendly and user-safe management approaches. Results indicated an improvement in community knowledge and skills in land management and fire prevention techniques. Moreover, residents began developing community forests as a sustainable source of income. The program also facilitated the dissemination of scientific knowledge and opened opportunities for forest-based livelihoods. A total of 80 participants were actively involved, and the activity significantly increased public awareness and participation in protecting the environment from fire hazards.

Keywords: Appropriate Technology; Community Empowerment; Community Forest; Peatland Fire Prevention; Training and Assistance.

INTRODUCTION

The forest fires that occurred in 2015 marked a dark year for air quality index in six provinces. These provinces include Riau, Jambi, South Sumatra, Central Kalimantan, South Kalimantan, and West Kalimantan. As of October 2015, satellite imagery from the Indonesian Forum for the Environment (WALHI) recorded fire occurrences spanning 52,985 hectares in Sumatra and 138,008 hectares in Kalimantan, totaling 191,993 hectares. The forest and land fires that affected these provinces resulted in recurring haze disasters. Furthermore, forest and land fires can also lead to an increased incidence of Acute Respiratory Infections (ARI) among humans (Department of Forestry and Plantation Muaro Jambi, 2017).

The extent of forest and land fires in Jambi Province from 2011 to 2015 shows an increase, as shown in **Table 1** below.

Table 1. Area of Forest and Land Fires in Jambi Province (ha) from 2011 to 2015

No	Year	Area
1	2011	89,00
2	2012	11,25
3	2013	199,10
4	2014	3.470,61
5	2015	19.528,00

Source: (Department of Forestry and Plantation Muaro Jambi, 2017)

Forest and land fires in Jambi Province are caused by the clearing of new land for Industrial Plantation Forests (HTI) and plantations, canalization of peatland areas, and shifting cultivation by community groups. This land clearing is typically carried out by both local communities and companies. In 2015, nine oil palm plantation and forestry companies, along

Edison, Ratnawati Siata, Dewi Sri Nurchaini

Preventive Measures for Peatland Forest Fires in Kumpeh Subdistrict, Muaro Jambi Regency

with fourteen individuals, were investigated in connection with forest and land fire (Karhutla) cases in Jambi Province. Four of the nine companies were named as suspects in the burning. These companies include the forestry company PT Dyera Hutani Lestari (DHL) and three oil palm plantation companies: PT Tebo Alam Lestari (TAL), PT Ricky Kurniawan Kartapersada (RKK), and PT Agro Tunggal Gemilang Abadi (ATGA) (Department of Forestry and Plantation Muaro Jambi, 2017).

The forest and land fires that occurred in Jambi Province in 2015 mostly took place on peatlands. Since early August 2015, these fires have destroyed thousands of hectares of oil palm plantations, privately-owned Industrial Plantation Forests (HTI), and local agricultural land. The fires also spread to Berbak National Park (TNB) as well as thousands of hectares of protected peat forest and the Grand Forest Park (Tahura) areas located in Muaro Jambi and Tanjung Jabung Timur Regencies, in the eastern part of Jambi Province (Suhendri & Purnomo, 2017).

Regional Regulation of Jambi Province No. 2 of 2016 concerning the Prevention and Control of Forest and Land Fires strictly prohibits individuals from opening land by burning. If landowners are found to have cleared land using fire, they will be subject to administrative or criminal sanctions. In addition to the prohibition on burning, the regulation outlines various preventive and control measures, including public outreach and education on the dangers and impacts of forest and land fires, training and simulation for fire handling, and training on land clearing without burning. Control measures include the preparation of personnel, equipment, facilities, and infrastructure; firefighting outside concession permit areas; identification of fire causes; law enforcement; and mitigation of fire impacts (Budiningsih, 2017; Saharjo & Artaningsih., 2022).

Peatlands are a type of wetland ecosystem with significant potential for the development of biological resources as a life-supporting system (Nurhayati et al., 2021; Hein et al., 2022). Peatlands serve various ecological functions,

including water resource conservation, flood mitigation, prevention of seawater intrusion, support for biodiversity and life forms, as well as climate regulation (Cassel, 1997).

The total area of peatlands in Indonesia is estimated at 20.6 million hectares (10.8% of the country's land area), with approximately 7.2 million hectares (35%) located on the island of Sumatra (Uda et al., 2019). In Jambi Province, the peatland area covers about 4,043,602 hectares (45% of the total land area). The use of peatlands for plantation purposes in Jambi Province reaches approximately 817,593 hectares (Department of Forestry and Plantation Muaro Jambi, 2017). This plantation area is projected to continue increasing in the future, supported by government policies and programs that position the plantation sector as a driver of economic growth and development (Parmadi et al., 2018). Plantations play a crucial role in supporting development in Jambi Province. According to the Provincial Spatial Planning (RTRWP) of Jambi and Regional Regulation (PERDA) No. 10 of 1994, the potential plantation area in Jambi Province is 3,300,767.5 hectares. By 2013, land utilization for plantation development had reached 2,857,567.65 hectares (Department of Forestry and Plantation Muaro Jambi, 2017).

Muaro Jambi Regency is one of the areas highly prone to forest and land fires. Fire management has been the responsibility of the Forestry and Plantation Office, while the operational efforts for fire suppression are carried out by the command post of the forest and land fire task force, which is coordinated by the Regional Disaster Management Agency (BPBD) of Muaro Jambi Regency.

In relation to the dangers of forest and land fires in Muaro Jambi Regency, the trend of fire hotspots observed through NAO 18 satellite imagery from 2010 to 2015 shows a significant increase. In 2010, only 21 hotspots were recorded, but the number rose sharply in 2011 and 2012 to more than 100 (Putra & Husni., 2021). Although there was a decline to 60 hotspots in 2013, the figure increased again to 105 in 2014, peaking in 2015 with a total of 297 fire hotspots.

The results of a study on the Valuation of Peat Fire Impacts in three regencies—Tanjung Jabung Barat, Tanjung Jabung Timur, and Muaro Jambi—revealed that Muaro Jambi Regency is the most fire-prone area. This is evident from the high percentage of potential fire-affected areas in Muaro Jambi, accounting for 41.1% of the total land area and 58.9% of the total burned peatland (Edison et al., 2017). Several sub-districts in Muaro Jambi Regency that must remain on alert due to their high peat fire risk include Kumpeh, Kumpeh Ulu, Maro Sebo, and Taman Rajo (Sabiham, 2007). The greatest fire potential in Muaro Jambi Regency occurs in peat depths of 200–400 cm, whereas in Tanjung Jabung Timur Regency, the highest fire potential lies in shallow peat areas (<50 cm). The total volume of potential peat fire across the three regencies reaches 46,217,181.2 m³, covering an area of 286,527.3 hectares (Putra & Puspawati, 2020).

Table 2. Areas with Forest and Land Fire Potential in Muaro Jambi Regency

District	Peat Depth	Fire Potential
Kumpeh	200 – 400 cm	Concentrated in plantation areas and forest plantations, with a total area of 71.3%
Kumpeh Ulu, Maro Sebo		Oil palm plantations owned by companies account for 45.7%
Taman Rajo		Hutan Tanaman 25,6%

The target of this community service program is to reduce forest fires and improve the welfare of the local community, which has been analyzed simply in the section above. The expected outcomes of this community service are: Forest Fire Prevention Management Techniques using Various Methods, and a National Publication on Forest Fire Prevention Management Techniques using Various Methods. The appropriate technology produced will be an environmentally friendly method of managing forest fire prevention. This technique is capable of reducing the

occurrence of forest fires and is commonly found in the activity locations. The implementation of this technique uses methods frequently encountered in the field. This approach can effectively prevent a significant number of forest fires within a short period of time. Overall, this method can reduce pollution in the villages where the activities take place, thereby improving security, comfort, and health for the community.

Innovation in the Dissemination of Technology Products to the community is reflected in the variation of forest fire management methods into various prevention techniques using simple methods. These methods will reduce pollution by combining several pollution-reducing functions that are safe, comfortable, and healthy for users while remaining effective. The advantage of this innovation is that it is practical and ergonomic, allowing it to be designed and redesigned according to the user's size.

METHODS

The dissemination of technology products to the community was carried out in Seponjen and Tanjung Villages, Kumpeh District, Muaro Jambi Regency. The location was chosen purposively, considering that it is one of the hotspots for peatland fires in Jambi, particularly in Muaro Jambi Regency. The community service program was implemented in 2018. In terms of its execution, this activity was carried out using several methods, including: (a) Counseling, (b) Field visits, (c) Consultations, and (d) Practical training.

1. Counseling. In this section, farmer groups will be given extension regarding techniques for preventing forest fires. The extension activity includes lectures and discussions that will be held in the Meeting Hall. During this activity, knowledge will be transferred from the extension officers to the target group. As part of the extension, participants will be provided with modules related to the activities to be carried out. If there are aspects of the module or verbal explanations that are unclear, participants

- can ask questions during the discussion session.
2. Field Visit. This field visit will be conducted by the Unja team together with local communities to visit the community forest areas. At the site, the community will be provided with explanations about fire prevention methods that can be applied in the field. The purpose of this visit is to directly introduce practices that are relevant to the theory previously explained.
 3. Consultation. After the practical activities are conducted, there will be follow-up visits to observe the continuation of these activities. These visits will also aim to address any difficulties or challenges that participants may face regarding the material provided. In this phase, the target group is directly involved in the learning process while working, allowing them to apply what they have learned in real field conditions.
 4. Skill Practice. Skill practice will take place at the Village Hall. In this session, the Activity Team will demonstrate fire prevention techniques directly to the participants. After the demonstration, participants will be asked to practice the theory they have learned. Through this hands-on practice, participants will better understand and master the techniques taught.
- b. Design: Designing solutions that meet the community's needs.
 - c. Production: Creating the necessary technology products.
 - d. Operational testing: Conducting trials to ensure that the technology products function properly.
 - e. Operational assistance: Providing support to the community in operating the implemented technology.
 - f. Application of technology products: Applying appropriate technology to the community/partners for direct use in their daily lives.

This method is designed to ensure that the solutions provided are truly aligned with the community's needs and can be effectively applied.

RESULTS AND DISCUSSIONS

The community engagement activities to be conducted in the field are divided into four main components: counseling, field visits, field consultations, and skills practice.

The methodology for implementing these activities outlines the stages or steps in carrying out the proposed solutions to address the identified issues, and includes the following:

1. Involved Parties. The parties involved in the dissemination of technology products to the community include Unja faculty, the target community, and the local government, which provides advice and support throughout the implementation process.
 2. Methods and Stages. The stages of implementing the dissemination of technology products to the community begin with:
 - a. Identification of community needs: Identifying the issues faced by the community related to forest and land fires.
1. Counseling. Following the initial engagement with the target group, a counseling session was conducted to enhance participants' understanding of peatland fire prevention. A pre-test was administered at the beginning of the session to assess participants' baseline knowledge regarding the causes, impacts, and mitigation techniques related to peatland fires. The pre-test results revealed that the majority of participants lacked adequate understanding of these critical issues.

During the session, participants demonstrated a high level of enthusiasm, as evidenced by their active participation in listening to the materials and asking relevant questions. This enthusiasm served as a key indicator of the community's strong motivation to enhance their knowledge and capacity, particularly in addressing environmental challenges in their surrounding areas (Prasanti & Fuadi,

2017; Witarsa et al., 2021). The counseling was delivered through an interactive, participatory approach that combined lectures, group discussions, and visual media. This method proved effective in increasing participant engagement and comprehension of the material presented (Avessina et al., 2018).

The counseling focused on raising awareness about the importance of preserving peatland ecosystems and the substantial risks posed by fires, including environmental degradation, public health hazards, and economic losses (Widiastuti & Latifah, 2017). The distributed counseling module was well received by participants, who found it practical and easy to understand. Several participants admitted during the discussion session that they had only recently become aware of the significant risks associated with traditional land-clearing practices involving burning, which are still commonly employed due to perceived efficiency.

Based on the dynamics observed during the session, it can be concluded that the counseling phase functioned not only as a platform for knowledge transfer but also as a medium for critical reflection among community members regarding their land management practices (Zulkarnaini & Lubis, 2019; Sutisna & Parinduri, 2020). This stage provided a crucial foundation for subsequent activities, namely field visits and skills training, as participants had already developed an initial conceptual framework concerning the urgency of peatland fire prevention. This activity is documented in Figure 1.



Figure 1. Implementation of The Counseling Session on Peatland Fire

Prevention with Active Participation from Community Members.

2. Field Visit. Following the counseling session, the program continued with a field visit to community-owned peatland areas. This activity involved the community service team from Universitas Jambi and local residents. The primary objective of the visit was to provide participants with direct insights into the field conditions and practical approaches for fire prevention.

During the field visit, participants exhibited active engagement, as reflected by the numerous questions raised regarding best practices in fire prevention and sustainable peatland management. This level of participation indicated a significant increase in critical awareness following the previous counseling session (Hesseln, 2018; Kincaid, 2022). Moreover, the field discussions offered an opportunity for participants to connect theoretical knowledge with on-the-ground realities, including identifying potential fire risks within their own regions.

The field visit also facilitated a dialogical space between the community and the university team to explore environmentally friendly land management strategies. Many participants admitted that prior to this activity, they had not fully understood the potential dangers of land burning practices or the high ecological value of peatlands.

Through this visit, an experiential learning approach was implemented, allowing participants to learn directly through experience and observation. This approach proved effective in deepening conceptual understanding while reinforcing participants' commitment to adopting environmentally sound practices (Malykhina et al., 2017; Bacciu et al., 2022). As such, the field visit served as a pivotal stage in bridging theory and practice, which is essential for the sustainable management of peatland ecosystems (Higgins et al., 2015). This activity is illustrated in Figure 2.



Figure 2. Visit from the Unja Team

3. Consultation. The consultation phase was conducted as a follow-up after the field visit and initial practical activities. During this session, participants were provided with opportunities to engage in further discussions, either individually or in groups, concerning the challenges they encountered and the development of agricultural practices suited to the specific characteristics of peatland areas.

This activity was designed to accommodate the needs of participants requiring deeper understanding or wishing to explore further the benefits and potential of peatlands. A more intensive two-way interaction occurred between the community service team and the target groups. Participants were encouraged to raise questions based on their direct field experiences and were offered practical, locally relevant solutions that they could implement (Billings et al., 2021; Risondi et al., 2022).

In addition to strengthening participants' understanding, the consultation session also allowed the service team to gain valuable field-based feedback to refine the approach and content for subsequent activities. This reflects the adaptive and responsive nature of the community engagement program in addressing the evolving needs of the community (Lake et al., 2017; Haldane et al., 2019). The documentation of this activity is presented in Figure 3.



Figure 3. The Community was Provided with Materials and Detailed Explanations Regarding Fire Prevention Strategies for Peatlands

4. Skills Practice. In this stage, participants engaged in hands-on practice using fire prevention tools and technologies, conducted at the village hall. The community service team began by demonstrating the procedures for operating the tools in a detailed and systematic manner. Participants were then given the opportunity to independently practice the methods they had learned, with guidance provided by the facilitators.

The main objective of this activity was to ensure that participants not only understood fire prevention concepts theoretically but also developed practical skills to apply them in real-world situations (Gaur et al., 2019; Kodur et al., 2020). The activity emphasized a learning-by-doing approach, which has proven effective in enhancing participants' technical competencies and building their confidence.

Participant responses during the skills practice session indicated a high level of enthusiasm. They demonstrated curiosity and active engagement throughout the session. This further supports the finding that participatory and hands-on approaches have a positive impact on the transfer of knowledge and skills (Schmidt et al., 2018; Hessburg et al., 2021).

This practical component is expected to foster behavioral change in sustainable peatland management and strengthen community preparedness for potential fire

hazards. Documentation of this activity is presented in Figure 4.



Figure 4. Field Training Activities.

Reaching 65% completion demonstrates that key components of the planned activities—such as awareness building, knowledge transfer, and participatory practices—are already underway and generating positive responses. This level of progress also suggests that the remaining stages, including advanced consultation and capacity-building efforts, can be further optimized through continuous engagement and follow-up sessions (Rose et al., 2017). Additionally, the community's growing awareness of the ecological and economic importance of sustainable peatland management indicates a meaningful shift in perception, which aligns with the long-term goals of this community empowerment initiative.

CONCLUSION

The implementation of this community engagement program—consisting of counseling, field visits, consultations, and hands-on practice—demonstrated a comprehensive and participatory strategy to enhance local capacity in peatland fire prevention. The integration of theory and practical experience enabled participants to not only improve their conceptual understanding but also develop applicable skills tailored to the characteristics of their environment. Active involvement during each stage of the program reflected a strong community interest in adopting sustainable land management practices. This participatory approach fostered both individual learning and collective awareness, encouraging behavioral change and local ownership of fire prevention initiatives. The program illustrates that a

combination of interactive education, experiential learning, and context-based consultation can serve as an effective model for future community-based environmental interventions, particularly in regions vulnerable to ecological hazards.

ACKNOWLEDGMENTS

We would like to express our sincere gratitude to all the individuals and organizations who have supported and contributed to the success of this community engagement program. Our deepest appreciation goes to the community members for their active participation, enthusiasm, and willingness to learn. We also extend our thanks to the team from Universitas Jambi for their dedication, expertise, and tireless efforts in conducting the counseling sessions, field visits, consultations, and hands-on practice. Special thanks to the local authorities and stakeholders for facilitating access to the peatland areas and ensuring a collaborative and supportive environment. Finally, we acknowledge the funding and resources provided by the [insert funding body or institution], which made this initiative possible. This project would not have been successful without the collective efforts of all involved.

REFERENCES

- Avessina, M. J., Kustari, S. A., & Anisa, Z. (2018). Empowering communities through extension communication [in Bahasa]. *Abdi Dosen: Jurnal Pengabdian Pada Masyarakat*, 2(3). <https://doi.org/10.32832/abdidos.v2i3.189>
- Bacciu, V., Sirca, C., & Spano, D. (2022). Towards a systemic approach to fire risk management. *Environmental Science & Policy*, 129, 37-44. <https://doi.org/10.1016/j.envsci.2021.12.015>
- Billings, M. C., Carroll, M. S., & Paveglio, T. B. (2021). The “strings attached” to community difference and potential pathways to fire adaptiveness in the wildland urban interface. *Journal of*

- Forestry*, 119(1), 13-27. <https://doi.org/10.1093/jofore/fva042>
- Budiningsih, K. (2017). Implementation of forest and land fire control policies in South Sumatra Province [in Bahasa]. *Jurnal Analisis Kebijakan Kehutanan*, 14(2), 165-186. <https://doi.org/10.20886/jakk.2017.14.2.165-186>
- Cassel, D.K. (1997). *Aquic Conditions and Hydric Soils: The Problem Soils*. SSSA Special Publication Number 50. New York: McGraw-Hill.
- Department of Forestry and Plantation of Muaro Jambi. (2017). Annual Report [in Bahasa]. *Unpublished Report*. Muaro Jambi: Department of Forestry and Plantation of Muaro Jambi.
- Gaur, A., Singh, A., Kumar, A., Kulkarni, K. S., Lala, S., Kapoor, K., & Mukhopadhyay, S. C. (2019). Fire sensing technologies: A review. *IEEE Sensors Journal*, 19(9), 3191-3202. <https://doi.org/10.1109/jsen.2019.2894665>
- Haldane, V., Chuah, F. L., Srivastava, A., Singh, S. R., Koh, G. C., Seng, C. K., & Legido-Quigley, H. (2019). Community participation in health services development, implementation, and evaluation: A systematic review of empowerment, health, community, and process outcomes. *PloS one*, 14(5), e0216112. <https://doi.org/10.1371/journal.pone.0216112>
- Hessburg, P. F., Prichard, S. J., Hagmann, R. K., Povak, N. A., & Lake, F. K. (2021). Wildfire and climate change adaptation of western North American forests: a case for intentional management. *Ecological applications*, 31(8), e02432. <https://doi.org/10.1002/eap.2432>
- Hein, L., Spadaro, J. V., Ostro, B., Hammer, M., Sumarga, E., Salmayenti, R., ... & Castañeda, J. P. (2022). The health impacts of Indonesian peatland fires. *Environmental Health*, 21(1), 62. <https://doi.org/10.1186/s12940-022-00872-w>
- Hesseln, H. (2018). Wildland fire prevention: A review. *Current Forestry Reports*, 4, 178-190. <https://doi.org/10.1007/s40725-018-0083-6>
- Higgins, E., Taylor, M., Francis, H., Jones, M., & Appleton, D. (2015). Transforming fire prevention: A case study. *Transforming Government: People, Process and Policy*, 9(2), 223-236. <https://doi.org/10.1108/tg-05-2014-0017>
- Kincaid, S. (2022). Fire prevention in historic buildings—approaches for safe practice. *The Historic Environment: Policy & Practice*, 13(3), 361-380. <https://doi.org/10.1080/17567505.2022.2098633>
- Kodur, V., Kumar, P., & Rafi, M. M. (2020). Fire hazard in buildings: Review, assessment and strategies for improving fire safety. *PSU research review*, 4(1), 1-23. <https://doi.org/10.1108/prr-12-2018-0033>
- Lake, F. K., Wright, V., Morgan, P., McFadden, M., McWethy, D., & Stevens-Rumann, C. (2017). Returning fire to the land: Celebrating traditional knowledge and fire. *Journal of Forestry*, 115(5), 343-353. <https://doi.org/10.5849/jof.2016-043r2>
- Malykhina, G. F., Guseva, A. I., & Militsyn, A. V. (2017). Early fire prevention in the plant. In *2017 International Conference on Industrial Engineering, Applications and Manufacturing (ICIEAM)* (pp. 1-4). IEEE. <https://doi.org/10.1109/icieam.2017.8076375>
- Nurhayati, A. D., Saharjo, B. H., Sundawati, L., Syartinilia, S., & Cochrane, M. A. (2021). Forest and peatland fire dynamics in South Sumatra Province. *Forest and*

- Society*, 5(2), 591-603. <https://doi.org/10.24259/fs.v5i2.14435>
- Parmadi, P., Emilia, E., & Zulgani, Z. (2018). The competitiveness of Indonesia's leading agricultural products in relation to economic growth [in Bahasa]. *Jurnal Paradigma Ekonomika*, 13(2), 77-86. <https://doi.org/10.22437/paradigma.v13i2.6677>
- Prasanti, D., & Fuady, I. (2017). Health information literacy outreach program to improve sanitation quality for communities at the foot of Mount Burangrang, West Bandung Regency [in Bahasa]. *JPPM (Jurnal Pengabdian dan Pemberdayaan Masyarakat)*, 1(2), 129-138. <https://doi.org/10.30595/jppm.v1i2.1705>
- Putra, E. I., & Husni, R. F. (2021). The relationship between rainfall and fire hotspots in the Londerang Peat Protected Forest (HLG), Jambi Province [in Bahasa]. *Journal of Tropical Silviculture*, 12(3), 129-134. <https://doi.org/10.29244/j-siltrop.12.3.129-134>
- Putra, E. I., & Puspawati, I. L. (2020). The influence of humidity, air temperature, and rainfall on peat fire occurrences in Tanjung Jabung Timur District, Jambi [in Bahasa]. *Journal of Tropical Silviculture*, 11(3), 189-193. <https://doi.org/10.29244/j-siltrop.11.3.189-193>
- Risondi, R., Lorita, E., Imanda, A., & Ningsih, M. S. (2022). The performance of the fire service office of Central Bengkulu Regency in dealing with fire hazards. *Jurnal ISO: Jurnal Ilmu Sosial, Politik dan Humaniora*, 2(2), 271-276. <https://doi.org/10.53697/iso.v2i2.1115>
- Rose, D. A., Murthy, S., Brooks, J., & Bryant, J. (2017). The evolution of public health emergency management as a field of practice. *American journal of public health*, 107(S2), S126-S133. <https://doi.org/10.2105/ajph.2017.303947>
- Saharjo, B. H., & Artaningsih, I. (2022). The role of communities in forest fire control in KPH Cepu, Central Java [in Bahasa]. *Journal of Tropical Silviculture*, 13(02), 162-168. <https://doi.org/10.29244/jsiltrop.13.02.162-168>
- Schmidt, I. B., Moura, L. C., Ferreira, M. C., Eloy, L., Sampaio, A. B., Dias, P. A., & Berlinck, C. N. (2018). Fire management in the Brazilian savanna: First steps and the way forward. *Journal of Applied Ecology*, 55(5), 2094-2101. <https://doi.org/10.1111/1365-2664.13118>
- Suhendri, S., & Purnomo, E. P. (2017). Institutional strengthening in the prevention and control of forest and land fires in Muaro Jambi District, Jambi Province [in Bahasa]. *Journal of Governance and Public Policy*, 4(1), 174-204. <https://doi.org/10.18196/jgpp.4175>
- Sutisna, S. P., & Parinduri, S. K. (2020). Enhancing community skills and potential through community empowerment. *Abdi Dosen: Jurnal Pengabdian Pada Masyarakat*, 4(4), 412-420. <https://doi.org/10.32832/abdidos.v4i4.735>
- Uda, S. K., Hein, L., & Atmoko, D. (2019). Assessing the health impacts of peatland fires: A case study for Central Kalimantan, Indonesia. *Environmental Science and Pollution Research*, 26(30), 31315-31327. <https://doi.org/10.1007/s11356-019-06264-x>
- Widiastuti, T., & Latifah, S. (2017). Empowering peatland farmers through the peat water clarification process [in Bahasa]. *JPPM (Jurnal Pengabdian dan*

Edison, Ratnawati Siata, Dewi Sri Nurchaini

Preventive Measures for Peatland Forest Fires in Kumpeh Subdistrict, Muaro Jambi Regency Pemberdayaan Masyarakat, 1(2), 155-159.
<https://doi.org/10.30595/jppm.v1i2.1750>

Witarsa, R., Nurmalina, N., & Mufarizuddin, M. (2021). Digital literacy counseling in Ridan Permai village [in Bahasa]. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 2(3), 1104-1111.
<https://doi.org/10.31004/cdj.v2i3.2962>

Zulkarnaini, Z., & Lubis, E. E. (2019). Community empowerment in the sustainable utilization of peatland ecosystem. *Jurnal Kebijakan Publik*, 9(2), 89-96.
<https://doi.org/10.31258/jkp.9.2.p.89-96>