

IIUM JOURNAL OF HUMAN SCIENCES

A Peer-reviewed Journal
ISSN 2682-8731 (Online)

- The Role of Information Processing in Vaccine Acceptance: A Study of Malaysian Facebook Comments on COVID-19 Boosters 1-18
Tan Pui Khei
- The Power of Multinational Corporations in the Global Food System: A Critical Analysis of Neoliberal Food Policies 19-47
Puteri Mariam Diana Binti Ahmad Mosadik
- Social Cultural Values, Audience Preferences and Quality of Content in Vernacular Radio Broadcasts in Kenya: A Study of Maasai Radio 48-65
William Mutende Peshut & Hezron Mogambi
- The Influence of Big Five Personality Traits and Technology Readiness on the Intention to Use an E-commerce Application: A Theoretical Review 66-78
Essayad Ali Tidjani, Aida Mokhtar & Ahasanul Haque
- Exploring Environment Communication Messages for Forest Preservation in West Sulawesi, Indonesia 79-87
Andi Nur Aisyah Rusnali, Tuti Bahfiarti, Muliadi Mau & Muhammad Faried
- Role Of Positive Emotions in Reducing Job Stress: Tips for Millennial and Z Generation Employees 88-100
Nicolas & Amy Mardhatilla
- A Pilot Study on Factors Influencing Audiences' Continuance Intentions of Chinese Online Film Festival 101-113
Yang Yening, Akmar Hayati Ahmad Ghazali & Sharil Nizam bin Sha'ri
- The Role of Subjective Well-being in Adolescent Academic Achievement: A Qualitative Study 114-136
Rika Hardani, Diana Setiyawati & Yuli Fajar Susetyo
- Strengthening the Local Wisdom of Paissangang Sumombal Sandeq Boat in Attitude Tawakkal of Mandar Tribe Fishermen 137-149
Andi Nur Fitrah, Tuti Bahfiarti & Muhammad Farid
- The Impact of Daily Media Consumption: A One-Week Diary Study of Undergraduate Students at Bayan College, Oman 150-166
Doreen Akello & Aisha Alkaabi

IIUM Journal of Human Sciences

Editor-in-Chief Prof. Dr. Shukran Abdul Rahman, *Malaysia*, Dept. of Psychology, AHAS KIRKHS, IIUM
Email: shukran@iium.edu.my

Editor Assoc. Prof. Dr. Rohaiza Rokis, *Malaysia* Dept. of Sociology and Anthropology, AHAS KIRKHS, IIUM, rohaiza@iium.edu.my

Section Editor Dr. Syarifah Fatimah Alzahrah Al-Attas, *Malaysia, Malaysia* Dept. of Sociology and Anthropology, AHAS KIRKHS, IIUM
Email: fatimahalattas@iium.edu.my

Section Editor Assoc. Prof Dr. Zeti Azreen Ahmad, *Malaysia*, Dept. of Communication, AHAS KIRKHS, IIUM Email: azreen@iium.edu.my

Section Editor Dr Ramzi Bendebka, *Malaysia*, Dept. of Political Science, AHAS KIRKHS, IIUM
Email: ramzib@iium.edu.my

Associate Editors

Assoc. Prof. Dr. Che Mahzan, *Malaysia*, Dept. of Communication, KIRKHS, AHAS IIUM
Email: chemahzan@iium.edu.my

Assoc. Prof. Dr. Aini Maznina Abdul Manaf, *Malaysia*, Dept. of Communication, AHAS KIRKHS, IIUM
Email: maznina@iium.edu.my

Assoc. Prof. Dr. Mariam Adawiah Dzulkifli, *Malaysia*, Dept. of Psychology, AHAS KIRKHS, IIUM
Email: m.adawiah@iium.edu.my

Dr. Mardiana Mohamed, *Malaysia*, Dept. of Psychology, AHAS KIRKHS, IIUM
Email: mardiana@iium.edu.my

Assoc. Prof. Dr. Nor Diana Mohd. Mahudin, *Malaysia*, Dept. of Psychology, AHAS KIRKHS, IIUM
Email: nordianamm@iium.edu.my

Assoc. Prof. Dr. Noor Azlan Mohd Noor, *Malaysia*, Dept. of Sociology and Anthropology, AHAS KIRKHS, IIUM Email: noorazlan@iium.edu.my

Dr. Norasikin Basir, *Malaysia*, Dept. of Sociology and Anthropology, AHAS KIRKHS, IIUM
Email: norasikin@iium.edu.my

Assoc. Prof. Dr. Nadwah Hj. Daud, *Malaysia*, Dept. of Arabic Language and Literature, AHAS KIRKHS, IIUM Email: nadwah@iium.edu.my

Dr. Elmira Akhmetova, *Malaysia*, Dept. of History and Civilization, KIRKHS, IIUM
Email: elmira@iium.edu.my

Dr. Fachruddin Mangunjaya, *Indonesia*, Centre of Islamic Studies, Universitas Nasional

Prof. Dr. Fazal Rahim Khan, *Pakistan*, Dept. of Media and Communication Studies, International Islamic University Islamabad, Pakistan

Dr. Nada Ibrahim, *Australia*, Centre of Islamic Thought and Education, University of South Australia

Dr. Hassan Al Kurd, *Maldives*, Dept. of Sociology (Islam and Shariah), University of Maldives

Prof. Dr. Abdrabo Moghazy Abdulraof Soliman, *Qatar*, *Psychology* Program Coordinator
Applied Cognitive Psychology, College of Arts and Social Sciences, Qatar University
Email: Soliman@qu.edu.qa

© 2023 by International Islamic University Malaysia

All rights reserved. No part of this publication may be reproduced, translated, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the publisher.

Exploring Environment Communication Messages for Forest Preservation in West Sulawesi, Indonesia

Andi Nur Aisyah Rusnali, Tuti Bahfiarti, Muliadi Mau & Muhammad Faried

Hasanuddin University, Indonesia

ABSTRACT

This study explores environmental communication messages used to support forest preservation in West Sulawesi, Indonesia. Forests in West Sulawesi face grave threats from illegal activities such as illegal logging, forest fires, and land conversion, driven by a lack of public awareness regarding the importance of forest ecosystems. This research aims to analyse environmental communication messages used in forest conservation efforts in West Sulawesi and the effectiveness of these messages in raising awareness and changing people's behaviour. Considering the importance of forests as vital ecosystems that support human life and biodiversity, as well as balancing the global climate, preserving forests in this area is a priority. This research uses a qualitative approach with ethnographic communication methods to understand how environmental messages are conveyed, received, and interpreted by stakeholders, including local communities, government, and non-governmental organisations (NGOs). Data collection was carried out through non-participatory observation, in-depth interviews with key informants, and analysis of documents related to forest conservation campaigns. The research results show that effective environmental communication messages in preserving forests in West Sulawesi must consider the local cultural context, prioritise active community participation, and use relevant and easily accessible media. Other findings also show that messages conveyed through folklore and community-based educational activities are more effective in building awareness and changing behaviour than formal or bureaucratic messages. Additionally, support and collaboration between governments, NGOs, and local communities have proven crucial in strengthening and expanding the reach of forest conservation campaigns. This research provides strategic recommendations for increasing the effectiveness of environmental communication in forest conservation, including using participatory approaches, strengthening local communication capacity, and increasing access to relevant and accurate information.

Keywords: *Environmental Communication, Forest Conservation, Ethnographic Communication, West Sulawesi, Community Participation.*

INTRODUCTION

West Sulawesi is one of the provinces in Indonesia that has natural wealth in the form of diverse tropical forests (Matthias et al., 2004). Forests in this region support life for endemic flora and fauna and play an essential role in maintaining the balance of local and global ecosystems. Forests in West Sulawesi function as a carbon sink, regulator of the water cycle, and source of livelihood for surrounding communities, especially for those who depend on non-timber forest products and environmental services such as water and clean air (Alexander et al., 2024).

However, forests in West Sulawesi face serious threats due to various human activities, including illegal logging, expansion of plantation land, forest encroachment, and infrastructure

development (Asgaf et al., 2023). Deforestation that occurs not only causes loss of biodiversity and environmental degradation but also triggers natural disasters such as floods and landslides, which are increasingly occurring in the region (Jatmika et al., 2024). The rate of deforestation in West Sulawesi occurs significantly due to human activities (Jatna et al., 2020). Based on reports from the Ministry of Environment and Forestry (Ministry of Environment and Forestry), this province's deforestation rate has increased in the last few decades (KKLHK, 2022). Activities such as illegal logging, forest encroachment for oil palm, rubber, and cocoa plantations, and land conversion for infrastructure development cause large forest areas to be lost yearly (Daud & Fatmawati, 2019). By 2020, the rate of deforestation is estimated to reach thousands of hectares per year.

Lowland tropical forests and mangrove forests are the most threatened forest types in West Sulawesi (Ritabulan et al., 2023). Apart from that, primary forests, which are habitats for endemic Sulawesi species, such as anoa, babirusa, and Maleo birds, are also experiencing degradation due to human activities. Lowland forests are often targets for logging because of the high value of the wood. Several districts in West Sulawesi, such as Mamuju, Majene, Mamasa, and Polewali Mandar, experienced significant forest destruction. For example, in Mamuju, illegal logging and land encroachment for plantations are the leading causes of reduced forest cover (KKLHK, 2022). This district is also a centre of economic activity, which has led to an increase in forest land conversion. In the Mamasa Regency, the intensity of small to large landslides occurs more frequently during the rainy season (Prasetyo, 2024). This condition demands serious efforts to preserve forests through government regulations and active participation from the community.

Apart from the problems above, the author considers it essential to study how environmental communication messages are transmitted in the lives of people in West Sulawesi. In forest conservation efforts, ecological communication plays a vital role (Alex et al., 2023). Environmental communication aims to increase public awareness of environmental issues and encourage behavioural changes towards more environmentally friendly actions (Díaz-Pont et al., 2020). In West Sulawesi, various parties, including the government, NGOs, and the media, have carried out environmental communication campaigns to educate the public about the importance of forest conservation and invite them to get involved in conservation programs.

Environmental communication messages conveyed through various media, such as public campaigns, public service advertisements, social media, and environmental education, play an essential role in shaping people's perceptions and attitudes toward the environment (Hawley, 2022; James, 2018). However, the effectiveness of these messages in changing people's behaviour remains a challenge. Various factors such as socio-economic background, level of education, and local culture also influence how people receive and respond to these messages (Stephens & DeLorme, 2024).

Therefore, it is important to analyse how environmental communication messages are structured and delivered and how the people of West Sulawesi respond to them. This analysis will provide an overview of the effectiveness of the environmental communication strategies that have been implemented and provide recommendations for improving forest conservation campaigns in the future.

This research will focus on analysing environmental communication messages in forest conservation in West Sulawesi to understand the factors that influence the success or failure of forest conservation campaigns in this region. Through this research, more effective communication strategies can be found in involving the community and encouraging their active participation in preserving forests in West Sulawesi.

Environmental Communication

Environmental communication is a branch of communication science that focuses on conveying messages related to environmental issues to influence public attitudes and behaviour. It includes disseminating information to increase awareness, education, advocacy, and behaviour change regarding environmental problems. Environmental communication is usually delivered through various media channels, including mass media, social media, formal education, and community-based activities (Jurin, 2010).

As Littlejohn and Foss explain, environmental communication requires effective strategies to reach audiences with various backgrounds and cultures (Littlejohn et al., 2017). The effectiveness of environmental communication relies heavily on a good understanding of the audience, social context, and specific issues at hand. In West Sulawesi, environmental communication plays a key role in forest conservation efforts, considering the importance of involving local communities that live around the forest and are highly dependent on its natural resources (Pezzullo, 2024).

Communication Messages in Environmental Conservation

Environmental communication messages must be carefully designed to motivate action and change people's attitudes. According to Moser and Dilling, effective communication messages must be relevant, easy to understand, and able to arouse the audience's emotions. These messages often focus on the importance of sustainability and shared responsibility and the negative impacts of environmental degradation on everyday life (Huntington, 2007).

Several studies show that messages that emphasise the direct benefits of environmental conservation are more effective in mobilising society. For example, research conducted by Takahashi found that conservation campaigns that used personal narratives and strong visualisation had higher appeal and could encourage active participation from the community (Taro Takahashi et al., 2009).

In West Sulawesi, forest conservation messages often focus on the impacts of deforestation, such as the increased frequency of floods and landslides and the loss of livelihoods for local communities. The emphasis on the link between forest conservation and community welfare is hoped to change their perspective on the importance of protecting forests.

Community Participation in Forest Conservation

Community participation is an essential element in the success of forest conservation programs. Community participation can be divided into several levels, from passive participation, where the community only receives information, to active participation, where the community is directly involved in decision-making and program implementation (Sadiat et al., 2024).

The involvement of local communities in forest conservation in West Sulawesi is significant, considering that they have local knowledge and wisdom that can support conservation efforts. A community-based approach that involves communities in conservation activities, such as reforestation and community-based forest management, has proven effective in maintaining forest sustainability (Marcial et al., 2024).

However, various factors often hampered community participation, including a lack of understanding of the importance of conservation, limited resources, and conflicts of interest between

economic needs and environmental conservation (Mohamed & Salome, 2023; Savira et al., 2024). Therefore, ecological communication messages must be designed to overcome these barriers and provide practical solutions for society.

Model of Effective Environmental Communication

Various environmental communication models have been developed to increase the effectiveness of disseminating conservation messages. According to Rogers, in the diffusion of innovation theory, the spread of conservation messages can be more effective if it involves agents of change or opinion leaders trusted by the community (Rogers, 2004). In West Sulawesi, this model can be implemented by involving traditional or religious leaders in forest conservation campaigns.

In addition, the two-way communication model, as described by Grunig and Hunt in the symmetric communication model, is also crucial in forest conservation efforts (Mukhtar et al., 2018). This model emphasises the importance of dialogue between the message sender (government or NGO) and the recipient (the community) so that the community is heard and involved in decision-making related to forest conservation.

METHOD

The data analysis method used in this study is triangulation, which combines multiple data sources to enhance the validity and reliability of the findings. Triangulation was collected from three primary sources: in-depth interviews with stakeholders, document analysis of environmental communication campaigns, and direct field observations. The informants for the in-depth interviews include key factors such as government representatives from the Ministry of Environment and Forestry, local NGO representatives working on forest conservation, indigenous community leaders from the Mappurondo community, and local environmental activists. These informants provided valuable insights into forest preservation communication strategies and challenges.

Additionally, government reports, environmental campaign materials, policy briefs, and indigenous knowledge texts were analysed to understand the content and approach of the ecological communication messages. Direct field observations were conducted in various locations within West Sulawesi to capture the real-world context of forest conservation efforts. The data obtained from each source were compared and analysed to identify similarities, differences, and emerging patterns. This approach allows the researcher to gain a more comprehensive understanding of the environmental communication messages used in forest preservation and identify gaps or challenges in communication between the various involved parties. Thus, triangulation strengthens the research findings by ensuring that the results are not solely reliant on one source or method but derived from multiple complementary perspectives.

FINDINGS

This research aims to analyse the effectiveness of environmental communication messages in forest conservation in West Sulawesi, focusing on how these messages are delivered and received and influence community attitudes and participation. The research results were obtained through in-depth interviews, participant observation, and document analysis from various parties involved in environmental campaigns, such as the government, NGOs, local media, and local communities. The results of this research are divided into several main aspects:

Table 1: Type of Communication

Verbal Communication	Nonverbal Communication
Social media: NGOs and governments are utilizing platforms such as Facebook, Instagram, and WhatsApp to spread messages about the importance of forest conservation. These messages often take the form of infographics, short videos, and stories about the impact of forest destruction on people's daily lives.	Environmental Poster: A poster showing a picture of a full trash bin, with the small words "It's not just you who makes me dizzy, trash also makes me dizzy", sends a strong nonverbal message about the urgency of environmental conservation.
Public Service Announcements: Public service announcements on local radio and television focus on the dangers of deforestation and the importance of protecting forests to prevent natural disasters such as floods and landslides.	Symbolic actions: Actions such as planting trees en masse or wearing recycled clothing at public events are nonverbal messages that show support for environmental conservation.
Community-Based Campaigns: Environmental conservation programs often involve direct activities in the community, such as reforestation, tree planting, and environmental education conducted in local schools.	

Community Response to Messages

Community responses to environmental communication messages vary depending on their location, educational background, and involvement in forest conservation activities. People who live in areas often affected by natural disasters due to deforestation tend to be more responsive to these messages. They show increased awareness of the importance of protecting forests and are more involved in reforestation programs.

However, acceptance of these messages is still low in some areas, especially in remote rural areas. This is caused by poor access to communication media and low environmental literacy. Communities in this region tend to view forest conservation as the government's or NGOs' responsibility, so their participation in conservation programs is still minimal. The following explains how the people of West Sulawesi respond to environmental communication messages and the factors that influence this response.

Table 2. Factors Influencing Response

Factors Influencing Response	Types	Description
Awareness and Understanding	Environmentally Conscious Society	Community groups that have high environmental awareness, whether through formal education, NGO campaigns, or the media, tend to respond positively by increasing environmentally friendly behaviour. For example, they start to reduce plastic use, support reforestation programs, or get involved in waste management.

	People who are less environmentally aware	People who are less exposed to or have less understanding of environmental problems do not respond enthusiastically to environmental messages. They often consider environmental problems as issues that are not urgent or relevant to their daily lives.
The Relevance of the Message to People's Daily Life	Relevant Messages	People who live in areas prone to disasters such as floods or landslides due to deforestation tend to understand messages about the importance of protecting forests more easily. They are more open to taking part in reforestation or forest conservation programs because they experience the benefits directly.
	Irrelevant messages	messages that are too abstract or not directly related to people's daily lives do not receive attention. For example, messages about global climate change may not be considered important by rural communities who are more focused on local economic challenges.
Social and Cultural Influences	Local Culture that Supports Conservation	Traditional communities or communities with local wisdom that have a tradition of protecting nature, such as "customary forest" practices or sustainable use of natural resources, tend to be more receptive to environmental messages. Environmental communication messages that are in line with local values will be more easily accepted.
	Unsupportive local culture	On the other hand, in communities that have cultures or habits that pay little attention to the environment, environmental communication messages receive less attention. In this case, society is more concerned with short-term economic growth than environmental sustainability.
Level of Education and Access to Information	Higher Education	People with higher educational backgrounds have access to better information, so they understand the importance of environmental conservation more quickly and are more likely to act based on the information they receive.
	Low Education	People with low levels of education have difficulty understanding environmental messages, especially if the messages are conveyed using technical language or terms.
Economic Factors	Upper Middle Class	Community groups that are more economically prosperous have a greater capacity to respond to environmental messages, whether in the form of participation in environmental movements, financial contributions, or behavioural changes (for example, purchasing environmentally friendly products).
	Low Economic Class	For communities whose economies depend on the exploitation of natural resources, such as illegal logging or clearing land for agriculture, environmental conservation messages do not respond well because they see it as a threat to their livelihoods. In this case,

		environmental communication programs need to provide economic alternatives that support sustainability.
--	--	---

Obstacles in spreading the message

Some of the obstacles identified in the dissemination of environmental communication messages include:

Obstacles	Description
Lack of Technological Infrastructure	Limited internet access in rural areas of West Sulawesi limits the reach of messages spread via social media.
Lack of Formal Education about the Environment	The lack of environmental education in schools results in a low public understanding of the importance of forest conservation.
Economic Dependence on Forests	For some communities, activities that destroy forests, such as illegal logging and clearing land for agriculture, are still considered the main way to meet economic needs, so conservation messages are less effective.

Effectiveness of Environmental Communication Messages

The social and economic context of the community dramatically influences the effectiveness of environmental communication messages in West Sulawesi. Messages conveyed through social media and community-based campaigns have succeeded in increasing awareness among people with access to this information. However, in remote areas, the effectiveness of messages is still low due to limited access and economic dependence on forest exploitation.

To increase the effectiveness of environmental communication messages, several strategies need to be improved:

Communication Strategy	Description
Increased Access to Information in Remote Areas	Governments and NGOs need to find ways to expand the reach of conservation messages to remote areas through more traditional media such as radio, as well as involving community leaders and religious leaders as communication agents.
Environmental Education in Schools	Education about the importance of forest conservation must be part of the school curriculum in West Sulawesi to form environmental awareness from an early age.
Participatory Approach	Communities need to be more actively involved in forest conservation programs. Through a participatory approach that involves them in decision-making and program implementation, communities will feel they have greater responsibility for their environment.
Collaboration of Various Parties	Collaboration between government, NGOs, media, and local communities is the key to successful forest conservation. The government and NGOs can act as facilitators, while the media helps disseminate information, and the community acts as the main implementer in the field.

CONCLUSION

Environmental communication messages are critical to preserving forests in West Sulawesi and increasing public awareness of the importance of conservation. These messages can be conveyed widely and effectively through education, social media campaigns, community-based approaches, and public service announcements. However, challenges remain, especially concerning public awareness and conflicts between economic and environmental interests. Therefore, a more integrated and sustainable communication strategy is needed to ensure that forests in West Sulawesi can remain sustainable for future generations.

REFERENCES

- Alex, V. G. M., Danny, D. C. V., & Marina, V. M. (2023). Exploring the Role of ICTs and Communication Flows in the Forest Sector. *Sustainability*.
- Alexander, kurniawan, Sariyanto Putera, & Isdaryanti. (2024). Distribusi dan inventarisasi keanekaragaman jenis burung di kawasan kampus universitas sulawesi barat dan sekitarnya. . *Indonesian Journal of Ecology and Conservation*, 1(1).
- Daud, I., & Fatmawati, D. (2019). Potensi Hutan Rakyat Sebagai Penghasil Pangan di Desa Paku Kabupaten Polman, Sulawesi Barat. 11(1), 41–48.
- Díaz-Pont, Joana., Maesele, Pieter., EganSjölander, Annika., Mishra, Maitreyee., & Foxwell-Norton, K. (2020). *The Local and the Digital in Environmental Communication* (Joana. Díaz-Pont, Pieter. Maesele, Annika. Egan Sjölander, Maitreyee. Mishra, & K. Foxwell-Norton, Eds.; 1st ed. 2020.) [Book]. Springer International Publishing.
- Hawley, E. (2022). *Environmental Communication for Children Media, Young Audiences, and the More-Than-Human World* (1st ed. 2022.) [Book]. Springer International Publishing.
- Huntington, H. P. (2007). Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change. *Écoscience*, 14(4), 545–546.
- James, R. C. (2018). Environmental communication pedagogy and practice. *Environmental Education Research*, 24(8), 1224–1227.
- Jatmika, S., Leonardus REgan Kaswanto, Sofyan Sjaf, R.Aulia, Parahita, & Rohadi. (2024). Plant Biodiversity of Mixed Garden in Lariang Mamasa Watershed, West Sulawesi . *IOP Conferences Series*.
- Jatna, S., Myron, S., Habiburrahman, A. H., Fuad, Nurul, L., Winarni, Asri, A., Dwiyahreni, Muhammad, F., Sri, M., Chris, M., Bimo, P., & Zuliyanto, Z. (2020). Deforestation on the Indonesian island of Sulawesi and the loss of primate habitat. *Global Ecology and Conservation*, 24.
- Jurin, R. R. (2010). *Environmental Communication. Second Edition Skills and Principles for Natural Resource Managers, Scientists, and Engineers*. (Donny. Roush & K. Jeffrey. Danter, Eds.; 2nd ed. 2010.) Springer Netherlands.
- KKLHK (Kementerian Lingkungan Hidup dan Kehutanan). (2022). *Sekilas Sulawesi Barat*.
- Littlejohn, S. W. (2009). *Teori Komunikasi*. Salemba Humanika.

- Littlejohn, S. W., Foss, K. A., & Oetzel, J. G. (2017). Theories of Humas Communication. In *Journal of Chemical Information and Modeling* (Vol. 53, Issue 9).
- Asgaf, Kurniawan, & Halis. (2023). The Role of Actors in Forest Management in West Sulawesi Province. 1277.
- Marcial, T. G. T., Imee, G. G., & Bondee, P. (2024). Cultivating Multifaceted Participation in the Community-Based Forest Management (CBFM) Program in Communities of Northern Isabela. *American Journal of Environment and Climate*.
- Matthias, W., Ani, M., & Michael, M. (2004). Effects of Land Use on Bird Species Richness in Sulawesi, Indonesia. 18(5):1339-1346. *Conservation Biology*, 18(5), 1339–1346.
- Mohamed, S., & Salome, M. (2023). Does institutionalisation of community participation promise sustainability in governance of community forests? *JOURNAL OF THE GEOGRAPHICAL ASSOCIATION OF TANZANIA*.
- Mukhtar, M., Saleem, N., & Manzoor, S. (2018). Public relations behavior of public and private sector organizations in Pakistan: An exploration of Grunig and Hunt's models [Article]. *Dialogue (Dera Ismāil Khān, Pakistan)*, 13(4), 479.
- Pezzullo, P. C. (2024). On Environmental Communication as a Care Discipline [Article]. *Environmental Communication*, 18(1–2), 1–7. <https://doi.org/10.1080/17524032.2023.2300361>
- Prasetyo, R. B. E. (2024, May 24). BNPB: Akses jalan nasional Mamasa-Mamuju putus tertimbun tanah longsor. *Antara News*.
- Ritabulan, Tasmin, Irundu Daud, K. Qaizar, & Arham Ihsan. (2023). Development Strategy based on Potential Ecotourism Feasibility in Hutan Bambu Alu, West Sulawesi. *Jurnal Penelitian Kehutanan Bonita*, 5(1), 9–9.
- Rogers, E. M. (2004). A Prospective and Retrospective Look at the Diffusion Model [Article]. *Journal of Health Communication*, 9(sup1), 13–19. <https://doi.org/10.1080/10810730490271449>
- Sadiat, Funmilayo, & Arifalo. (2024). Assessment of Community Participation in Forest Conservation in Ondo State, Nigeria. . *African Journal of Agriculture and Food Science*.
- Savira, P. R., Leti, S., & Budi, K. (2024). Analysis of Factors Influencing Community Participation in Sustainable Forest Management in BKPH Mojoyayung, Madiun. *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan*.
- Stephens, S. H., & DeLorme, D. E. (2024). Incorporating lived experience narratives into interdisciplinary environmental communication projects: A technique for better environmental communication [Article]. *Environmental Science & Policy*, 160, 103855. <https://doi.org/10.1016/j.envsci.2024.103855>
- Taro Takahashi, Stewart C. Sutherland, & Colm Sweeney. (2009). Climatological mean and decadal change in surface ocean pCO₂, and net sea–air CO₂ flux over the global oceans. *Deep Sea Research Part II: Topical Studies in Oceanography*, 56(8), 554–577.