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## New media encourages environmental participation in the digital era

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### ABSTRACT

With the development of new media, there is a great opportunity for society to become more involved in environmental issues. However, previous research still shows a significant gap: most studies focus on the use of social media as a source of information, whereas the mechanisms used by new media to shape significant engagement, from awareness to collective action, are not well understood. Additionally, as most research has been conducted in the context of developed countries, the dynamics of digital participation in developing countries, such as Indonesia, are less well represented. By contrast, the State of the Art (SOTA) shows a shift from linear communication models to patterns of “collaborative action” and “networked collaboration,” in which people work together through digital platforms using personalized stories, virtual communities, and citizen data. This study conducted a systematic literature review using a descriptive-qualitative approach. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) principles and environmental communication matrix theory were used in the screening process; the Theory of Planned Behavior, Affordances Platform, and Theory of Social Impact were combined to create a thematic analysis. The relationship between new media features, the way user interactions occur, and the emerging forms of environmental participation became the focus of the analysis. The synthesis results show that new media can function as a communication ecosystem that accelerates the dissemination of environmental information, strengthens social norms that support the environment, and expands participation—from symbolic actions, such as sharing content, to substantive actions, such as donations, reporting environmental conditions, digital campaigns, and community collaboration. However, significant challenges, such as disparities in digital literacy, algorithmic bias, information polarization, and the lack of online participation, leading to offline actions with real impact, were also found. To optimize the use of new media as a driver of sustainable environmental action, this study emphasizes that a more inclusive digital communication model, evidence-based content strategies, and cross-actor collaboration are necessary.

**Keywords:** environmental communication; new media; participation; pro-environmental movement

## 1. INTRODUCTION

The climate crisis and environmental degradation demand a change in the way people learn, relate, and act. Environmental communication has evolved from a one-way medium to an interconnected ecosystem that allows for rapid cross-space cooperation. New media serves two functions at once as public spaces move to digital platforms: as a place for discussion, a tool for information distribution, and an infrastructure for collective action mobility.

The mobilization was strengthened by the number of internet users spread around the world. By early 2025, there will be 5.56 billion internet users, which is 67.9% of the global population. In addition to accelerating the spread of environmental practices and standards through broader social networks, this data shows that the audience that can be addressed has increased (DataReportal, 2025a). See Figure 1

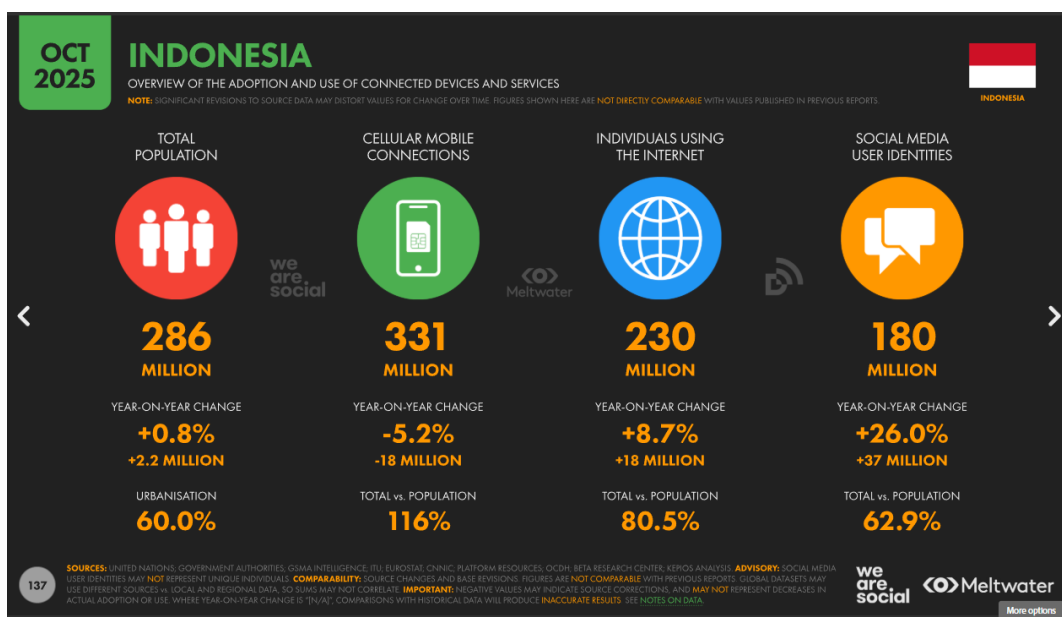


Figure 1. Frequency of Media Users in Indonesia

Source: Datareport.com

Indonesia also shows similar potential. As of January 2025, there are 212 million active internet users with a penetration of 74.6 percent, and 143 million social users, equivalent to 50.2 percent of the population. The young demographic structure and increasing urbanization reinforce the relevance of digital channels as a vehicle for environmental participation (DataReportal, 2025b). Trend The use of social media has become an interesting phenomenon in the movement of society, as in the phenomenon of Palestinian and Israeli aggression or genocide, many activist and humanitarian movements have based their activities on the concern for others. The movement began because of a phenomenon that is widely discussed in the content or narrative movement on social media.

Theoretically, the influence of new media on pro-environmental behavior can be understood through the Theory of Planned Behavior and Social Impact Theory. Exposure to messages, social interactions, and perceptions of network support on social media modulate attitudes, subjective norms, and perceived behavioral controls, which are then processed and understood to become intentions and actions (Liao et al., 2024). Empirical evidence shows a consistent link between digital engagement and the intent to act. Recent studies have shown that social media determinants influence pro-environmental intentions and behaviors through attitudes and norms, strengthening the role of platforms as drivers of the formation of social expectations for green behavior (Liao et al., 2024).

The form of the message is also crucial. An analysis of climate crisis memes found that participation can be triggered by creative formats that ignite attention, emotion, and collective identity,

and that discussion networks thicken and pave the way to more intense engagement (Johann, 2023). The Fridays for Future movement shows how digital channels support mobilization when offline action is hampered. During the lockdown period, communication strategies moved from calls to the streets to the strengthening of thematic discourse and the legitimacy of the movement, signaling the adaptation of the platform-based repertoire of actions (Haßler et al., 2021).

At peak moments, such as the Global Day of Climate Action, Twitter's analysis proves that digitally dispersed claims, social functions, and framing correlate with the intensity of collective participation across countries. This confirms the capacity of new media to foster cohesion and coordination of action in a short period of time (Fernández-Zubieta et al., 2023). The relationship between media use and environmental engagement is also observed at the behavioral level. Cross-behavioral survey data in Hong Kong show that social media use is associated with environmental activism and consumerism, complementing the effects of news media and reinforcing the "differential gains" of different channels (Zhang & Skoric, 2018). Specifically in Indonesia, the study of environmental organizations shows social media as a channel to build awareness, bridge citizen information, and connect virtual spaces with policy participation. However, the digital literacy gap remains an obstacle to inclusion (Susanto & Thamrin, 2021).

Digital participation does not stop at communication; it also produces data together. Citizen science studies have shown that citizen content uploads on popular platforms map human–ecosystem interactions and open up opportunities for evidence donations by communities for regional management (Jingu et al., 2024). These various contents become "big data" that clearly discuss an object, and social media data can accelerate ecological monitoring. The use of social media imagery to detect and map specific objects shows how citizen participation metamorphoses into an operational evidence infrastructure for the environment (Cardoso et al., 2024).

The findings lead to three mechanisms of new media influence: the formation of knowledge and attitudes through repeated exposure, the reinforcement and formation of social norms through networks and gestures of approval, and mobilization through distributed coordination and platform affordances, ease of access, and features (likes, comments, and shares) that drive message algorithms. All three produce a spectrum of participation, from shares and donations to petitions and volunteers, to data co-production. However, the literature acknowledges the need for more substantive causal evidence and indicators of offline action. Recent reviews place social media at the center of climate communication but emphasize new methodological challenges as well as technopolitical shifts affecting the relationship between exposure, engagement, and mobilization (Schäfer, 2025). The next gap is related to the content design dimension. The effectiveness of short, live, and visual content is still rare compared experimentally between platforms, even though studies on memes have shown distinctive mobilization pathways and the expansion of discussion networks (Johann, 2023).

The context of developing countries is also underrepresented. The characteristics of platforms, participation cultures, and platform policies in Indonesia have the potential to moderate the impact of new media, while local findings are still scattered and have not been comparatively linked across platforms and regions (Susanto & Thamrin, 2021). The issue of equal access is a prerequisite. Indonesia's digital adoption statistics show progress, but disparities in region, speed, and digital literacy affect citizens' opportunities to participate meaningfully, from information consumption to community action (DataReportal, 2025b). With this landscape, a systematic literature study is needed to curate cross-disciplinary evidence regarding the role of new media as drivers of environmental participation. Focusing on psychosocial mechanisms, content design, and platform affordances will help separate vanity indicators from substantive action indicators. The study also proposes an assessment of outcome indicators that are anchored to real-world action. Measures such as volunteer participation, citizen data contributions, environmental thematic musrenbang participation, and the sustainability of participation across campaign cycles will be evaluated by referring to evidence that has been tested in previous studies. The expected theoretical contribution is the integration of cross-behavioral approaches and networks to refine new media-based environmental participation models. In practical terms, the results of the synthesis are expected to guide policy and campaign design for local governments, community organizations, groups (activists), and digital platforms so that digital engagement is converted into measurable and long-lasting collective action.

Previous research has only reviewed correlations, not causal sequences, and the lack of comparative studies between actors has limited policy recommendations. The roles of local governments, organizations, communities, local media, and platforms are often portrayed as separate, rather than as co-production ecosystems, and focus on environmental roles. These gaps underscore the need for a literature review that not only records “whether new media is influential” but also maps how, through what pathways, under what conditions, and for whom it results in long-lasting and impactful participation. Looking at the identification in the previous statement, the researcher saw a gap between meaningful participation by new media users related to exposure to new media and environmental actions that were still weak. In the above research and development direction, the main objective of this study is to compile an empirical and systematic literature review on how new media encourages public participation in environmental issues in Indonesia and global learning. Theoretical benefits are in the form of refinement of the conceptual framework of media-participation relations; practical benefits in the form of content design recommendations, collaboration tactics, and structuring participation performance indicators so that the digital ecosystem has a real impact on sustainability.

## **2. LITERATURE REVIEW**

### **2.1. Media Content and Environmental Impact**

The effective use of mass media and social media has also been proven to be able to change individual attitudes and behaviors to be more positive towards the environment, thereby supporting the sustainability of the environment collectively (Agung & Shahadan, 2024). Some studies also indicate that exposure to social media and online interactions can influence the formation of pro-environmental attitudes and subjective norms of individuals, encouraging them to be more active in environmental issues (Liao, 2024). Additionally, social media platforms such as Instagram have proven to be highly effective as a digital marketing method, enabling direct interaction with consumers through engaging visual content and personalized campaigns (Akbar & Madura, 2024; Dewi & Avicenna, 2020). These platforms can encourage behavior change that is pro-environment, encourage critical thinking about environmental concerns. Furthermore, Social Impact Theory is also very related where behavioral changes that have been accepted by new media consumers will have a pro-environmental social change impact, those who are constantly exposed to new media content on content that they find interesting, it is proven that it can influence consumers’ decision-making processes and increase their engagement with pro-environmental brands or movements (Wulandari & Putri, 2025). Research conducted by Singha and Azad et al. further supports that effective social media strategies can influence consumer decision-making and increase their engagement with a brand or movement, even predictable through integration with machine learning (Wulandari & Putri, 2025). These environmental movements are often amplified by the ability of social media to facilitate mass communication and personalization of messages, which collectively encourage the formation of social norms that support pro-environmental behavior (Liao, 2024). In this context, the interaction of content and strategy on social media has a significant impact on consumer perception and engagement with the company’s products or services, as well as with environmental initiatives (Wulandari & Putri, 2025). Evidence from previous research reviews discusses new media as a driver of environmental movement participation. This shows that digital platforms have become a crucial channel for social mobilization and the formation of public opinion related to sustainability issues (Akbar & Madura, 2024; Wulandari & Putri, 2025). The exposure of pro-environmental information is influenced by bigdata according to the desires of new media users, but the essence will change as the content of the content is interesting, which can pamper users, one of which is the content of the increasingly massive pro-environmental movement. The use of social media in promoting pro-environmental behavior is significantly influenced by the platform’s ability to shape subjective attitudes and norms, which in turn encourages behavioral intent through the lens of Planned Behavior Theory (Liao, 2024; Zafar et al., 2021). A user can be affected by his or her behavior as cognitively based on the content consumed, given that continuous exposure to pro-environmental content on social media can shape perceptions and behaviors, the mechanism of user engagement through interaction, sharing, and participation in online campaigns is

crucial in driving collective action (Alam et al., 2023). Overall, new media and its various platforms support participation in the pro-environmental movement. Recent studies also highlight the strategic role of digital media in influencing consumer behavior and encouraging sustainable lifestyles, particularly through environmental campaigns disseminated on social platforms (Akdeniz, 2025). In addition, the integration of technologies such as big data and artificial intelligence allows for user personalization to increase the effectiveness of user engagement with sustainability initiatives (Wulandari & Putri, 2025). The use of social media also creates unique opportunities for environmental communication reach and promotes sustainability-related behavioral change (Zhang, 2025). However, the role of digital activism in environmental issues still faces challenges, especially in optimizing the use of social media platforms to effectively build public awareness and concern (Putri & Pratiwi, 2022). Lack of content and awareness from the public towards pro-environmental movements Therefore, a more innovative and comprehensive environmental communication strategy is needed, not only to increase awareness, but also to actively mobilize the community to be involved in conservation and sustainability efforts (Girsang & Situmeang, 2023). Social media optimization through emotion-provoking uploads, interactive content, and the use of relevant hashtags can significantly increase audience engagement and strengthen community networks on environmental issues (Putri & Pratiwi, 2022). Overall the new media study supports the participation of the pro-environment in line and proves that the learning, role of new media content from various new media platforms is possible and effective in environmental participation in the digital age.

### **3. RESEARCH METHOD**

A qualitative descriptive method was used in this study, and a systematic literature review was conducted. The aim of the qualitative descriptive approach is to provide a comprehensive overview of the relationship between new media and environmental participation in the digital age. This approach does not use quantitative hypotheses or statistical generalizations. This method makes it possible to explore the phenomenon of environmental communication through a narrative and thematic analysis of current literature sources. Theoretical frameworks, such as the Theory of Planned Behavior and the Theory of Social Impact, support this approach in the study of communication science to map the role of new media as a driver of attitudes, social norms, networks, and mobilization of action.

To ensure completeness, transparency, and reproducibility of the source selection process, a thorough literature review was conducted. (1) identification, (2) screening, (3) feasibility assessment, and (4) inclusion are PRISMA measures tailored for qualitative studies. This process centers on theoretical and empirical research on new media topics (such as interactive content, digital platforms, and social media) in the context of environmental participation. Special emphasis is placed on the case of Indonesia and learning around the world (Page et al., 2021).

The research was in the form of a systematic literature review with a planned search strategy, selection based on inclusion-exclusion criteria, quality assessment, and thematic synthesis. The analysis was developed abductively: theory guides the formation of initial codes, while literature data enriches and corrects the framework. Four lenses guide the reading described above Further Theory of Planned Behavior to link attitudes, norms, and controls of perceived behavior with pro-environmental intentions and actions; connective action logic to explain loose network-based mobilization and message personalization; the concept of networked publics to understand how network media architectures configure public spaces; and platform affordance theory to map how visibility, persistence, editability, and association shape participation pathways (Liao et al., 2024). In the Indonesian context, this framework is linked to the literature on social media-based environmental activism and the role of civil society organizations, such as WALHI, in reading the dynamics of mobilization, advocacy, and the translation of digital engagement into local policy action (Susanto & Thamrin, 2021).

The analysis process begins with a systematic review of international and national scientific publications published between 2018 and 2025. This time frame was chosen because it reflects the phase of accelerating digital transformation and the emergence of various social media platforms that are active in public discourse on environmental issues through four lenses: (1) identification (133 articles), (2) filtering

(83 articles), (3) feasibility assessment (39 articles), and (4) inclusion (12 articles). The search was conducted in the Scopus database, Web of Science, DOAJ, ScienceDirect, and national academic portals such as GARUDA and SINTA. The selection of such databases ensures that the reviewed literature is sourced from credible and verified academic research (Page et al., 2021).

Furthermore, the literature analysis is focused on two main dimensions: (1) previous research material, which includes contexts, topics, objects, and findings related to new media and environmental participation, and (2) previous research methodologies, which include research design, analysis methods, data collection techniques, and measurement tools used. This structure allows researchers to create an epistemological map that shows the extent to which this field has developed and where conceptual and methodological issues still exist.

#### **4. RESULT AND DISCUSSION**

Preliminary analysis findings show that social media has become a major channel for building interactive relationships with consumers, especially through visual content and influencer marketing (Akbar & Madura, 2024). The use of this digital platform allows organizations and individuals to disseminate political information faster and more widely, and to build a network of solidarity for the mobilization of collective action (Adila et al., 2023). Technologies such as big data, artificial intelligence, and marketing automation also increase campaign effectiveness, resulting in a more immersive personalization experience for the intended audience (Akbar & Madura, 2024). This study reinforces the main argument that social media serves as an important tool for social movements related to global issues, strengthening the ability of activists and organizations to interact with audiences directly (Wahyudi et al., 2024). This is in line with previous research showing how social media encourages public participation in environmental protests and drives social justice movements online (Susanto & Thamrin, 2021). Planned Behavior theory is closely related to the ability of social media to raise awareness, shape attitudes, and encourage pro-environmental behavioral intentions among users (Putri & Pratiwi, 2022).

The role of new media as the main channel in building interactive relationships through visual content and influencer marketing strengthens the ability of activists and organizations to disseminate environmental information and mobilize collective action (Adila et al., 2023; Akbar & Madura, 2024). New media as a multi-platform channel is a tool for creating or encouraging environmental participation, both through the rapid dissemination of information and the construction of solidarity networks globally (Asmiyono & Rahmawati, 2025; Syahputri & Katimin, 2024). This phenomenon indicates a shift in activism towards a hybrid form that integrates online and offline collective action, supported by computer-mediated communication in shaping relationships in the postmodern era (Putri & Pratiwi, 2022). This facilitates rapid and widespread mass mobilization, allowing environmental campaigns to reach a larger and more diverse audience (Hariyani, 2016). This shift is changing the landscape of social activism, allowing environmental movements to leverage new media to increase the visibility and impact of their campaigns (Putri & Pratiwi, 2022). It also creates new forms of cultural production and ecological citizenship, in which environmental knowledge and dialogue are quickly shared with a very wide audience (Susanto & Thamrin, 2021).

Beyond these general patterns, the thematic synthesis of the 12 included studies points to three recurring pathways through which new media translates environmental information into participation. First, repeated exposure to credible and shareable content strengthens environmental awareness and problem recognition, which in turn shapes attitudes toward pro-environmental behavior. Second, social interactions on platforms (such as likes, comments, reposts, and peer-to-peer discussions) operate as a norm signal: users learn what behaviors are socially approved and feasible within their reference groups. Third, platform affordances such as visibility, persistence, and easy coordination lower the threshold for collective action, allowing intentions to be converted into concrete steps, such as joining campaigns, donating, reporting environmental problems, or volunteering (Liao et al., 2024; Susanto & Thamrin, 2021).

Content design matters because not all exposure produces the same depth of engagement. The reviewed studies consistently highlight that visual narratives, short videos, and memetic formats can trigger

emotions, strengthen collective identity, and invite participation in ways that purely informational posts often fail to achieve. On Instagram, sustainability-oriented visual storytelling helps normalize environmental concern and makes “green” practices feel socially mainstream, whereas climate crisis memes can expand discussion networks by combining humor with moral urgency (Cornelio et al., 2024; Johann, 2023). Influencer-driven communication and personalized messaging further amplify reach and perceived relevance; however, evidence also suggests that persuasive content is most effective when it is tied to clear behavioral cues (what to do next) rather than abstract awareness alone (Akbar & Madura, 2024; Zafar et al., 2021).

A key contribution of the literature is clarifying what “participation” looks like across a spectrum, from symbolic engagement (sharing, commenting, and hashtag use) to substantive engagement with measurable impact. Studies of movement communication show that digital mobilization is strongest when online repertoires are explicitly linked to offline or institutional channels, such as coordinated event participation, petitions, fundraising, and sustained community work. During periods when street protests are constrained, for example, movements adapt by shifting toward narrative consolidation and legitimacy-building online, but still depend on pathways that reconnect audiences to on-the-ground action (Haßler et al., 2021). Similarly, an analysis of peak events, such as global climate action days, indicates that framing strategies and the social functions of claims influence coordination intensity across countries, suggesting that participation is shaped not only by content volume but also by how issues are framed and relational ties are activated (Fernández-Zubieta et al., 2023).

Finally, the review flags boundary conditions that explain why high online engagement does not always yield real-world environmental outcomes. Digital literacy gaps and unequal access limit who can participate meaningfully, whereas algorithmic curation can privilege polarizing or entertainment-oriented content over evidence-based messages, increasing fragmentation and “slacktivism” risks (Susanto & Thamrin, 2021; Schäfer, 2025). Several studies have also shown that participation becomes more durable when users can contribute something tangible, such as citizen-generated observations or images that support environmental monitoring, turning platforms into infrastructures for data co-production rather than discussion spaces alone (Jingu et al., 2024; Cardoso et al., 2024). Taken together, these findings imply that future campaigns and policies in Indonesia should prioritize inclusive communication design, transparent and credible information sources, and cross-actor collaboration so that digital participation is routinely connected to offline programs, community institutions, and measurable sustainability indicators.

## 5. CONCLUSION

Referring to the findings that have been discussed, it can be concluded that new media has become a crucial pillar in environmental digital activism, facilitating mass mobilization, education, and the formation of social norms that support sustainability (Hajri & Daife, 2024; Putri & Pratiwi, 2022). Specifically, the use of new media as a digital multiplatform channel plays a dual role in pro-environmental and social movements. The integration between digital awareness and tangible actions has emerged, which is demonstrated through increased individual participation in various environmental initiatives and changes in consumption behavior towards a more environmentally friendly direction (Vural & Öz, 2025). The development of digital technology has also changed the landscape of an effective pro-environment movement by meeting the evolving needs of the audience and the role of the pro-environmental movement. The results described above provide practical insights for both the government, academics, and citizens. New media has become a transition channel for delivering significant information quickly and effectively at minimal cost. New media orientation with the fulfillment of good social and relational elements in increasing pro-environmental movements that are easily accepted and designing arguments that are easy to understand to citizens or users, makes a faster and more impactful contribution. New media and pro-environmental content can collaborate to expose users or citizens to pro-environmental information and change their behavior.

Although the role of new media is very good in disseminating information and providing literacy insights, it certainly needs to be monitored because of the presence of pro-environmental activists who

are absent from the actual concept. The emergence of online questionnaires also shows the role of residents in protecting the environment so that the participation of netizens (users) is also clearly concerned about the surrounding natural environment

### **Ethical Approval**

Not Applicable

### **Informed Consent Statement**

Not Applicable

### **Authors' Contributions**

MZ conceptualized the study, designed the SLR protocol based on the PRISMA principles, conducted the literature screening and thematic synthesis, and drafted the manuscript. SS contributed to the validation of article selection, interpretation of findings, and development of the environmental communication matrix-based analytical framework. DRH assisted in refining the theoretical integration (Theory of Planned Behavior, Platform Affordances, and Theory of Social Impact), strengthening the thematic analysis, and critically revising the manuscript. RH supported data extraction and organization, contributed to the synthesis of the results and discussion, and performed the final language and formatting edits. All authors have read and approved the final version of the manuscript.

### **Disclosure Statement**

The authors report no potential conflict of interest.

### **Data Availability Statement**

The data presented in this study are available upon reasonable request from the corresponding author, subject to privacy constraints.

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### **Notes on Contributors**

#### **Meiby Zulfikar**

Meiby is a lecturer at Bina Bangsa University, specializing in communication science. Her academic expertise lies in researching and studying various relevant disciplines. She is currently an active doctoral student in development communication, as the alignment of theory and practice motivates her to continue learning and contributing to society and development.

#### **Sarwititi Sarwoprasodjo**

Dr. Ir. Sarwititi Sarwoprasodjo, M.S. is a lecturer in the Department of Communication Sciences and Community Development (SKPM), Faculty of Human Ecology (FEMA) at IPB University, Bogor. She earned her doctorate in Communication Science from the University of Indonesia in 2007. Her expertise included developmental communication, rural sociology, and agricultural extension, with a focus on communication planning, community empowerment, and local institutions in rural areas.

### **Dwi Retno Hapsari**

Dr. Dwi Retno Hapsari, S.P., M.Si. Dr. Dwi Retno Hapsari, S. P., M. Si., is a lecturer at IPB University in the Department of Communication Sciences and Community Development, Faculty of Human Ecology. At the institutional level, she is listed as the Broadcasting Program Supervisor at the Directorate of Cooperation, Communication, and Marketing at the IPB. Her profile also appears on the official IPB University organizational structure page and campus activity publications. In academic and community service activities, she is listed as the author of papers on digital literacy education and technology-based digital capacity-building for koi-fish farmers. She is also an IPB academic who expresses policy views related to child protection through social media access. Her work focuses on communication, digital literacy, and community empowerment.

### **Riska Handayanti**

Riska is a lecturer in Information Systems at Bina Bangsa University. Riska is interested in the role of algorithms that can drive behavioral changes that become fundamental and repetitive without being noticed. Riska believes that digital capacity will become a new concept in human life, in which human cognition is built not from an academic perspective but from how extensively one explores the digital world.

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