

Social Innovation Strategy of Semarang Zoo to Build Conservation Awareness Through Public Education

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ABSTRACT

This study aims to analyze how Semarang Zoo employs social innovation strategies to build public awareness of wildlife conservation through public education programs. Using a qualitative descriptive approach with a case study method, data were collected through observation, interviews, documentation, and literature review involving Semarang Zoo management, educators, and visitors. The findings reveal that Semarang Zoo develops conservation education through innovative outreach programs, including Zoo to School, Zoo to Mall, Car Free Day education campaigns, animal shows, and interactive learning activities. These initiatives extend conservation education beyond the zoo environment and create opportunities for direct public engagement with wildlife conservation issues. From a social innovation perspective, the study demonstrates how conservation education can be delivered through collaborative, participatory, and experiential approaches that respond to the challenge of limited public conservation literacy. The findings also indicate several constraints, including uneven visitor engagement and challenges in sustaining public participation over time. This study contributes to the social innovation literature by illustrating how educational communication strategies can function as socially innovative mechanisms for expanding conservation learning in community settings. Rather than confirming long-term behavioral change, the findings suggest that such programs have the potential to strengthen public awareness and engagement with conservation issues, highlighting the need for further research on their long-term impacts.

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1. INTRODUCTION

The environmental crisis has emerged as one of the most pressing global challenges of the twenty-first century. Climate change, habitat degradation, biodiversity loss, and illegal wildlife trade continue to

threaten ecosystem sustainability across the world. According to the World Wide Fund for Nature (World Wide Fund for Nature, 2024), monitored wildlife populations have declined by an average of 73% since 1970. This alarming trend indicates that conservation issues are no longer solely ecological concerns but also social challenges closely linked to public awareness, participation, and responsibility toward environmental sustainability. Consequently, effective conservation efforts require not only ecological interventions but also strategies that encourage active community engagement and long-term behavioral change.

As one of the world's megabiodiversity countries, Indonesia possesses extraordinary biological wealth. However, biodiversity conservation continues to face significant threats. The latest report from (TRAFFIC, 2023) indicates that Indonesia remains one of the major hubs for illegal wildlife trade in Southeast Asia. At the same time, rapid urbanization, land-use conversion, and economic development have increased pressure on wildlife habitats and reduced the availability of green spaces. These challenges suggest that conservation efforts cannot rely solely on regulatory enforcement and government initiatives. Instead, they require broader public involvement supported by effective educational and communication approaches that foster conservation awareness and pro-environmental behavior.

Figure 1: Indonesia as Megabiodiversity No. 2 in 2022



At the regional level, Central Java faces similar conservation challenges. According to the Central Java Natural Resources Conservation Agency (Balai Konservasi Sumber Daya Alam Jawa Tengah, 2023), increasing urban expansion has contributed to habitat fragmentation and heightened threats to wildlife populations. Furthermore, reports from TRAFFIC (2023) indicate that Central Java remains one of the regions associated with wildlife trafficking activities in Indonesia. These conditions demonstrate the urgent need for conservation strategies capable of strengthening public ecological awareness and encouraging active participation in wildlife protection efforts.

In this context, environmental communication plays a crucial role in bridging scientific knowledge and public action. Participatory environmental education is essential for fostering environmentally responsible attitudes and behaviors (UNESCO, 2023). However, contemporary studies suggest that information dissemination alone is often insufficient to generate meaningful and sustainable behavioral change. Individuals are more likely to internalize conservation values when they are directly involved in learning processes and are provided with opportunities to experience environmental issues firsthand. Therefore, conservation institutions are increasingly challenged to develop educational approaches that move beyond one-way communication toward more participatory and experiential forms of engagement.

Alongside these developments, social innovation has gained increasing attention as a promising approach to addressing complex social and environmental challenges. Social innovation involves the development of new ideas, practices, and collaborative processes that create social value and contribute to transformative change (Avelino et al., 2019). Social innovation focuses not only on novelty but also on

generating sustainable social impacts through community participation (Howaldt et al., 2018). Within the field of conservation, social innovation offers opportunities to connect environmental objectives with public engagement, thereby enhancing the effectiveness of conservation initiatives.

While this study draws upon environmental communication and conservation education literature, its primary analytical perspective is social innovation. Environmental communication and public education are positioned as mechanisms through which social innovation is developed and implemented within conservation institutions. Unlike environmental communication studies that primarily focus on message delivery, audience engagement, and communication effectiveness, or environmental education studies that emphasize learning outcomes and knowledge acquisition, this research focuses on how conservation institutions design and implement innovative participatory practices that create social value and encourage collective action for conservation. From this perspective, conservation awareness is not viewed merely as the result of information dissemination or educational activities, but as a social process emerging through collaboration, participation, and experiential learning. Therefore, this study examines how conservation organizations integrate participatory communication, public education, and community engagement into broader social innovation strategies aimed at fostering conservation awareness and long-term behavioral change. This perspective enables a more comprehensive understanding of how conservation institutions can transform educational activities into sustainable social innovation practices that strengthen public participation in wildlife conservation.

One conservation institution that has begun implementing such approaches is Semarang Zoo. As an urban conservation organization, Semarang Zoo has expanded its role beyond recreation by developing various public education programs aimed at increasing conservation awareness. Programs such as Zoo to School, Zoo to Mall, Car Free Day (CFD) outreach activities, animal feeding sessions, animal shows, and digital conservation campaigns reflect efforts to integrate conservation education with participatory communication and experiential learning. Through these initiatives, visitors are encouraged not only to receive information about wildlife conservation but also to actively engage in conservation-related learning experiences.

Semarang Zoo represents a unique case within the context of conservation education in Indonesia. Unlike conventional zoos that primarily function as recreational attractions, Semarang Zoo has expanded its role through outreach-based educational programs that extend beyond the zoo environment. Through school visits, public campaigns, community engagement activities, and digital conservation initiatives, the institution actively reaches audiences who may have limited exposure to conservation issues. This transformation reflects an effort to reposition the zoo not only as a conservation institution but also as an agent of social change that promotes environmental awareness through participatory public education. Consequently, Semarang Zoo provides a relevant setting for examining how conservation organizations utilize innovative educational and communication approaches to encourage public engagement in conservation issues.

Recent studies have increasingly recognized zoos as strategic institutions for conservation education and public engagement. Modern zoos are no longer viewed solely as recreational facilities but are also expected to contribute to biodiversity conservation through educational programs that foster environmental awareness and pro-conservation behavior. Research has shown that zoo-based educational experiences can positively influence visitors' conservation knowledge, environmental attitudes, and behavioral intentions. Zoo-based educational programs can contribute to conservation awareness by strengthening visitors' connection to nature, fostering positive attitudes toward species conservation, and encouraging pro-environmental intentions and behaviors (Blandford et al., 2023; Kleespies et al., 2022). However, conservation-related behaviors are shaped not only by knowledge acquisition but also by motivational and participatory factors, highlighting the importance of interactive and engaging educational approaches (Nageotte & Buck, 2023). Studies have also highlighted that effective interpretation and educational design within zoo environments can significantly enhance visitor engagement and support pro-conservation learning outcomes (Edney et al., 2023). These findings indicate that zoos can serve as important platforms for fostering conservation awareness and public participation. Nevertheless, the effectiveness of zoo-based conservation education largely depends on how

communication strategies, educational approaches, and participatory mechanisms are designed and implemented within each institution.

Previous studies have demonstrated the positive contribution of environmental education to increasing environmental knowledge and awareness. Environmental education programs can improve public understanding of conservation issues, although increased knowledge does not always translate into long-term behavioral change (Ardoin et al., 2020). Although many environmental education programs have been successful in increasing public awareness, they often face challenges in sustaining long-term public engagement and participation in conservation activities (Monroe et al., 2022). These findings suggest that educational outcomes should not be assessed solely through knowledge acquisition but also through their ability to foster meaningful behavioral transformation.

Research on social innovation has likewise highlighted its potential to address sustainability challenges through collaborative and participatory approaches. Social innovation has been recognized as a mechanism for facilitating social transformation through stakeholder mobilization, collaborative problem-solving, and community engagement (Avelino et al., 2019). It also plays an important role in supporting sustainability transitions by fostering new forms of participation and governance (Howaldt et al., 2018). Nevertheless, existing research has predominantly focused on community development, public services, and governance contexts, leaving the application of social innovation within wildlife conservation and public environmental education relatively underexplored. In addition, recent environmental communication research underscores the importance of participatory communication in promoting environmental awareness and action. Environmental messages become more effective when audiences are actively involved through dialogue, direct experiences, and collaborative engagement (Cox & Pezzullo, 2026).

Despite the growing literature on conservation education, zoo-based learning, environmental communication, and social innovation, these areas have largely been examined independently. Existing studies predominantly focus on evaluating educational outcomes, increasing environmental knowledge, or assessing communication effectiveness. Meanwhile, social innovation research has mainly concentrated on community development, governance, and public service transformation. As a result, limited attention has been given to understanding how social innovation strategies, participatory communication practices, and experiential learning approaches are integrated within zoo-based conservation education programs to foster long-term conservation awareness and behavioral change. Furthermore, empirical evidence from conservation institutions in developing countries, particularly zoos in Indonesia, remains scarce. Consequently, the mechanisms through which conservation organizations transform educational activities into sustainable social innovation practices capable of influencing public attitudes, participation, and conservation behavior remain insufficiently understood.

One institution that provides a relevant opportunity to address this gap is Semarang Zoo. Semarang Zoo represents a unique case within the context of conservation education in Indonesia. Unlike conventional zoos that primarily function as recreational attractions, Semarang Zoo has expanded its role through outreach-based educational programs that extend beyond the zoo environment. Through school visits, public campaigns, community engagement activities, and digital conservation initiatives, the institution actively reaches audiences who may have limited exposure to conservation issues. Programs such as Zoo to School, Zoo to Mall, Car Free Day (CFD) outreach activities, animal feeding sessions, animal shows, and digital conservation campaigns reflect efforts to integrate conservation education with participatory communication and experiential learning. Through these initiatives, visitors are encouraged not only to receive information about wildlife conservation but also to actively engage in conservation-related learning experiences. This transformation reflects an effort to reposition the zoo not only as a conservation institution but also as an agent of social change that promotes environmental awareness through participatory public education. Consequently, Semarang Zoo provides a relevant setting for examining how conservation organizations utilize innovative educational and communication approaches to encourage public engagement in conservation issues.

The novelty of this study lies in its integration of social innovation, environmental communication, and conservation education perspectives to examine how zoo-based educational programs function as

mechanisms for building conservation awareness. Unlike previous studies that primarily focus on educational outcomes, visitor learning, or communication effectiveness, this study analyzes conservation education as a social innovation process that combines participatory communication, experiential learning, and community engagement. Furthermore, by focusing on Semarang Zoo, this study contributes empirical evidence from an Indonesian zoo context, which remains underrepresented in the existing literature on conservation education and social innovation.

Therefore, this study aims to analyze the social innovation strategies implemented by Semarang Zoo in building conservation awareness through public education programs. Specifically, the study examines the communication processes, forms of community participation, and educational approaches employed in various conservation initiatives. By addressing the identified research gap, this study contributes to the development of environmental communication, social innovation, and conservation education literature while providing practical insights into how conservation institutions can foster sustainable public engagement in wildlife and environmental conservation.

2. METHODS

This study employed a qualitative descriptive approach using a case study design to explore how Semarang Zoo implements social innovation strategies and participatory communication practices to foster public conservation awareness through its educational programs. A qualitative approach was selected because the study seeks to gain an in-depth understanding of social processes, communication interactions, stakeholder experiences, and the meanings constructed through conservation education activities. Qualitative research is particularly suited to exploring and interpreting the meanings that individuals and groups attribute to social phenomena within their natural contexts (Creswell & Creswell, 2023). Therefore, this approach is appropriate for examining how conservation messages are communicated, negotiated, and experienced by diverse stakeholders.

A case study design was adopted because the research focuses on a specific organization, namely Semarang Zoo, which actively develops conservation education initiatives as part of its social innovation efforts. Case studies allow researchers to investigate contemporary phenomena within real-life contexts and provide comprehensive insights into organizational practices, communication processes, and stakeholder interactions (Yin, 2018). Therefore, the case study design was considered appropriate for examining the relationship between social innovation, participatory communication, and conservation awareness within the context of conservation education programs. The design also enables an integrated examination of these three perspectives within a single conservation institution, an approach that remains relatively limited in previous zoo-based conservation education research.

The study was guided by three analytical concepts: social innovation strategy, participatory communication, and conservation awareness. Social innovation strategy refers to the development and implementation of new approaches, programs, or practices that address social needs while generating social value and encouraging community involvement (Howaldt et al., 2018). The analysis of social innovation strategies was guided by five indicators: (1) identification of conservation-related social problems, (2) development of innovative educational solutions, (3) stakeholder participation and collaboration, (4) creation of social value through conservation education, and (5) sustainability and potential diffusion of innovation.

Participatory communication refers to communication processes that encourage dialogue, interaction, collaboration, and active involvement among stakeholders in producing shared understanding and collective action (Servaes, 2020). In this study, participatory communication was examined through four dimensions: (1) dialogue and two-way communication, (2) stakeholder participation in educational activities, (3) knowledge sharing and collaborative learning, and (4) empowerment and engagement in conservation initiatives.

Conservation awareness refers to an individual's understanding, concern, responsibility, and willingness to engage in environmental and wildlife conservation efforts. It can be understood through four interrelated dimensions: (1) cognitive awareness, including knowledge and understanding of conservation issues; (2) affective awareness, including concern and appreciation for wildlife and

biodiversity; (3) behavioral intention, including willingness to support conservation efforts; and (4) conservation action, including participation in environmentally responsible practices (Ardoin et al., 2020; UNESCO, 2023).

The research focused on several educational programs organized by Semarang Zoo, including Zoo to School, Zoo to Mall, conservation campaigns conducted during Car Free Day events, animal shows, animal feeding sessions, and digital conservation campaigns through social media platforms. These programs were selected because they represent various forms of social innovation and participatory communication designed to communicate conservation messages to diverse audiences through both face-to-face and digital channels.

These analytical concepts served as the conceptual framework guiding the entire research process. The indicators associated with social innovation strategy, participatory communication, and conservation awareness were used to develop observation protocols, interview guides, and coding categories for data analysis. Through this framework, the study systematically examined how conservation education programs were designed and implemented, how communication and participation were facilitated among stakeholders, and how conservation awareness was expressed and interpreted by participants. The integration of these three analytical concepts also reflects the novelty of the study, as previous research has often examined conservation education, environmental communication, and social innovation separately. By linking these perspectives within a single case study, the research provides a more comprehensive understanding of how conservation institutions can utilize educational programs as socially innovative mechanisms for fostering public engagement in conservation issues.

The research was conducted at Semarang Zoo, Semarang City, Central Java, Indonesia, and at several outreach locations where educational programs were implemented, including schools, shopping centers, and public spaces used for Car Free Day activities. Data collection was carried out from February to May 2025.

Research participants were selected using purposive sampling. Purposive sampling enables researchers to identify participants who possess relevant knowledge and experience related to the phenomenon under investigation (Campbell et al., 2020). The study involved eight informants consisting of one Acting Head of Semarang Zoo, two education officers, one marketing officer, and four visitors who participated in conservation education activities. These participants were selected because of their direct involvement in planning, implementing, managing, or experiencing the educational programs examined in this study.

The number of participants was determined based on the principle of data saturation, whereby additional interviews no longer generated substantially new information relevant to the research objectives (Saunders et al., 2023). Data saturation was achieved when recurring themes concerning conservation education, communication practices, stakeholder participation, and conservation awareness consistently emerged across interviews. Although the number of participants was relatively small, the selected informants represented key stakeholder groups directly involved in the planning, implementation, management, and experience of conservation education programs. This diversity of perspectives provided sufficient depth and contextual richness to comprehensively address the research objectives and support robust qualitative interpretation.

In qualitative research, the researcher serves as the primary research instrument. The researcher directly conducted observations, interviews, documentation collection, and data interpretation. Such involvement enabled the researcher to gain a contextual understanding of communication practices, participant interactions, and audience responses within conservation education settings.

Data were collected through participant observation, in-depth interviews, documentation, and literature review. Observations were conducted during educational activities and focused on communication interactions, participant engagement, message delivery strategies, dialogue processes, and public responses. Observation guidelines were developed based on the indicators of social innovation, participatory communication, and conservation awareness.

In-depth interviews were conducted using semi-structured interview guides. The interviews explored participants' perspectives regarding educational objectives, innovation processes, communication practices, stakeholder involvement, implementation challenges, and perceived impacts on conservation awareness. The interview guidelines were developed according to the analytical dimensions established in this study.

Documentation was used to complement and validate information obtained through observations and interviews. Documentation included photographs of educational activities, educational materials, promotional content, social media posts, institutional reports, and program archives. Additionally, a literature review was conducted to strengthen the theoretical foundation of the study by examining books, scholarly journals, research reports, and policy documents related to social innovation, participatory communication, conservation education, and environmental awareness.

Data analysis followed the interactive model proposed by Miles et al. (2020), consisting of data condensation, data display, and conclusion drawing and verification. During data condensation, interview transcripts, observation notes, and documentary materials were coded and categorized according to themes associated with social innovation strategy, participatory communication, and conservation awareness. The categorized data were then presented through thematic narratives and interpretative descriptions to facilitate comprehensive analysis. Conclusions were continuously verified throughout the research process to ensure consistency and analytical rigor.

To ensure trustworthiness, the study employed source triangulation and method triangulation. Source triangulation involved comparing information obtained from management representatives, education staff, marketing staff, and visitors. Method triangulation was conducted by comparing findings derived from observations, interviews, and documentation. According to Flick (2022), triangulation enhances the credibility, dependability, and validity of qualitative findings by integrating multiple sources of evidence.

Ethical considerations were maintained throughout the research process. Prior to participation, all informants received information regarding the purpose and procedures of the study and voluntarily agreed to participate. Participants were informed that their responses would be used solely for academic purposes. Confidentiality and anonymity were protected throughout the study, and all research data were managed responsibly in accordance with established ethical principles.

Through these procedures, the study sought to generate a comprehensive and contextually grounded understanding of how Semarang Zoo utilizes social innovation strategies and participatory communication practices to strengthen public conservation awareness through conservation education programs.

3. FINDINGS AND DISCUSSION

3.1 Communication Strategies in Public Education Programs

The findings show that Semarang Zoo implements educational, participatory, experiential, and digital communication strategies through Zoo to School, Zoo to Mall, Car Free Day (CFD) education, animal shows, animal feeding sessions, and social media campaigns. From the perspective of Lasswell's communication model, Semarang Zoo managers and educators function as communicators, conservation serves as the primary message, educational activities and digital platforms operate as communication channels, while students, visitors, and the broader community become the intended audiences. This model helps explain the basic structure of conservation communication implemented by Semarang Zoo.

However, the findings indicate that the communication process extends beyond Lasswell's linear framework. Educational activities involve direct interaction, audience questions, dialogue, clarification, and continuous adaptation of messages according to participants' responses. Communication therefore occurs as a reciprocal process rather than a one-way transmission of information.

This finding aligns more closely with Freire's concept of participatory communication, which emphasizes dialogue as a process through which knowledge is collectively constructed rather than

transferred from educators to passive recipients. During educational sessions, visitors were encouraged to ask questions, share experiences, and discuss conservation issues with educators. The educational process therefore functioned not only as information delivery but also as a space for mutual learning between educators and participants.

The principle of dialogue was particularly visible when educators responded to misconceptions regarding animal welfare at Semarang Zoo. Swandito Widyotomo explained that educational sessions are frequently used to address public concerns circulating on social media, especially comments suggesting that certain animals appear undernourished.

"During the education session, for example, if there is an issue on social media about our animals being thin, well, during the education session, of course, we will explain, for example, tigers, when we post there will definitely be comments that they are thin, but we explain that not all tigers are plump, but some are long and some are thin like that." (Swandito Widyotomo, Direktor PT Taman Satwa Semarang).

This interaction demonstrates that conservation communication at Semarang Zoo is not limited to transmitting information but also involves dialogue and clarification. Visitors are provided opportunities to express concerns, while educators respond by contextualizing information and correcting misunderstandings. Such practices reflect Freire's view that communication should encourage critical reflection rather than passive acceptance of messages.

Furthermore, Freire emphasizes empowerment as a central objective of participatory communication. The findings suggest that Semarang Zoo seeks to empower visitors by increasing their understanding of wildlife conservation and encouraging them to become active participants in conservation efforts. Through animal feeding sessions, interactive educational activities, and conservation campaigns, participants are invited not only to learn about wildlife but also to recognize their role in supporting conservation. In this context, education functions as a process of fostering awareness, responsibility, and engagement rather than merely disseminating information.

Therefore, Semarang Zoo's conservation communication strategy can be understood as a participatory process characterized by dialogue, mutual learning, clarification of public issues, and efforts to empower audiences to become more actively involved in conservation practices. This finding extends beyond Lasswell's transmission model and supports Freire's argument that meaningful communication should facilitate participation and social transformation.

This finding suggests that conservation communication also functions as a mechanism for clarifying public issues and addressing misinformation in digital environments. Effective digital communication plays an important role in maintaining public trust and responding to issues that emerge in online spaces (Maulina et al., 2026). However, Semarang Zoo's clarification efforts still appear largely reactive, as responses are provided only after public concerns have emerged. A more strategic approach would involve systematic monitoring of public sentiment and the development of fact-based educational content to address potential misinformation before it becomes widespread.

Figure 2. Zoo To School



The Zoo to School program demonstrates how direct experience can make conservation learning more tangible and engaging for students. Observations indicate that students were more attentive when educators incorporated animal introductions, quizzes, mini-games, and question-and-answer sessions into the learning process. Direct interaction with the surrounding environment can serve as an effective learning resource by connecting educational content with firsthand observation, while ecological citizenship initiatives have been shown to enhance environmental awareness among students (Herman et al., 2023; Kusnadi & Lutfi, 2023). Nevertheless, Zoo to School differs from formal school-based programs because it is primarily event-based and episodic in nature. Although the program appears effective in stimulating curiosity and increasing short-term conservation awareness, its contribution to long-term behavioral change remains uncertain, as environmental education initiatives often face challenges in sustaining lasting engagement and behavioral transformation (Ardoin et al., 2020; Monroe et al., 2019).

"The methods used are usually presentations, interactive activities such as quizzes or mini-games that are still related to the world of protected animal conservation. Furthermore, he also explained that "the interaction between educators and visitors is usually quite active, with many questions asked to educators regarding how animals reproduce, their age range, their distribution, and their conservation status." (Reza Danang, Educator).

Figure 3. Car Free Day and Zoo To Mall



Zoo to Mall and Car Free Day (CFD) activities extend conservation communication beyond the zoo environment, enabling Semarang Zoo to reach broader audiences who may not actively seek conservation-related information. Public-space engagement strategies have been recognized as important for enhancing visitor involvement and promoting environmental awareness in recreational and community settings (Ayuningtyas et al., 2025). However, educational interactions in malls and CFD events are often brief and highly dependent on momentary public attention. As a result, while these initiatives are effective in expanding audience reach and increasing exposure to conservation messages, their capacity to foster deeper reflection, sustained engagement, and long-term behavioral change remains limited.

"The personal approach method by combining animal and personal interactions is more effective because it is more understandable and easier to understand." He also stated that educational materials are tailored to audience segmentation, for example, "Preschool and elementary schools are given an introduction to animals starting from food and breeding, while junior high and high schools tend to focus more on the distribution areas of animals and their habitats." (Drh Nico, Educator).

Figure 4. Animal Show

Animal shows and feeding sessions show the use of experiential and persuasive communication. Visitors not only receive information but also build emotional connections with animals through direct interaction. Zoo-based animal encounters can strengthen pro-environmental intentions by creating meaningful emotional connections between visitors and wildlife (Blandford et al., 2023). However, this approach also presents an inherent challenge. While entertainment-oriented activities can effectively attract public attention and increase engagement, they may inadvertently reduce animals to objects of spectacle if they are not accompanied by adequate educational interpretation. Therefore, animal encounter programs should be integrated with messages concerning animal welfare, habitat threats, and conservation ethics to ensure that visitor engagement contributes to deeper conservation awareness rather than merely providing entertainment.

"I learned about protected animals, the difference between deer genders, and education about venomous and non-venomous snakes." Furthermore, Joa also explained that "at Semarang Zoo, it's not just a vacation but also an opportunity to interact directly such as feeding, taking photos with animals, and seeing endangered species directly." (Joa, Visitors).

"The educational program makes us realize that animals are also part of what we must protect from extinction." (Adys, Visitors).

"I think it's easy to understand because it uses casual language and directly describes the animal examples being explained." However, she also added that "in the future, perhaps it could be developed more creatively so that the educational message is easy for visitors to understand and remember." (Arum, Visitors).

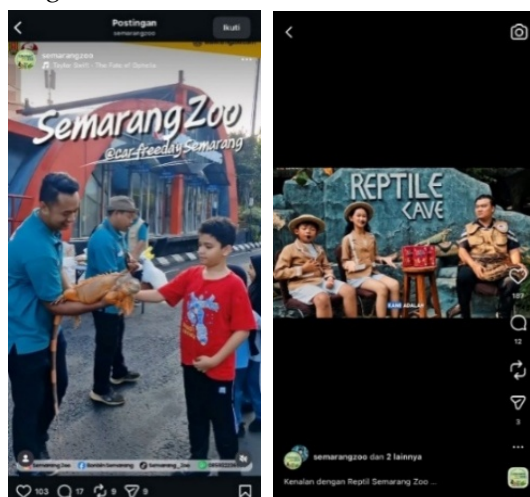
These visitor responses show that informal language, direct examples, and animal interaction make conservation messages easier to understand. However, understanding during the activity should not be equated with long-term effectiveness. The main challenge is ensuring that visitors remember the message and translate it into conservation behavior after leaving the zoo. Thus, Semarang Zoo's communication strategy is effective in creating initial awareness, but it still needs follow-up mechanisms to evaluate behavioral impact.

3.2 Implementation of Social Innovation in Conservation Education

The public education programs implemented by Semarang Zoo can be interpreted as a form of social innovation in conservation education. Based on Farransahat's (2020) social innovation theory, social innovation refers to new solutions developed to address social needs. In this study, the identified social need is the low level of public conservation literacy. Semarang Zoo responds to this challenge through educational initiatives that extend beyond the zoo environment into schools, shopping centers,

public spaces, and digital platforms. These programs demonstrate how social innovation is operationalized through the integration of participatory communication and public education. Communication functions as the mechanism for disseminating conservation messages and facilitating interaction with diverse audiences, while education serves as the process through which conservation knowledge, awareness, and values are developed. This finding is consistent with Avelino et al. (2019) and Howaldt et al. (2018), who view social innovation as the creation of social value through participatory practices. However, the findings also indicate that the innovation remains stronger at the level of program delivery than structural transformation, as community participation is still largely limited to attendance and interaction rather than active involvement in planning, implementation, or evaluation.

Figure 5. Digital Media as a Means of Information Dissemination



Viewed through the stages of social innovation, Semarang Zoo's initiatives demonstrate how communication and public education are integrated into the innovation process. Problem identification emerged from management's recognition that many people continue to perceive zoos primarily as recreational facilities rather than conservation institutions. In response, the zoo developed programs such as Zoo to School, Zoo to Mall, CFD education, animal shows, animal feeding activities, and digital conservation campaigns. These initiatives represent innovative educational practices that rely on communication processes to reach diverse audiences and encourage public participation. Through these programs, communication functions not only as a channel for disseminating conservation information but also as a means of creating learning experiences that support conservation awareness. Therefore, the innovation developed by Semarang Zoo lies not merely in the creation of new programs but in the integration of communication and education within a broader strategy to address low conservation literacy. Nevertheless, there remains limited evidence of systematic evaluation capable of measuring long-term changes in knowledge, attitudes, and conservation behavior, indicating that the innovation has not yet fully progressed toward sustainable social transformation. This limitation is consistent with Hapsah et al. (2025), who found that sustainability education programs often face challenges related to participation, resource availability, and long-term program continuity.

As part of Semarang Zoo's social innovation strategy, digital media functions simultaneously as a communication mechanism and an educational platform through which conservation awareness is promoted. Through social media, conservation information, educational content, and environmental campaigns can reach broader audiences beyond the physical boundaries of the zoo. Digital platforms facilitate communication, collaboration, and social connection, enabling conservation messages to reach and engage diverse audiences more effectively (Cahyo et al., 2026). Digital platforms can increase audience participation in message dissemination while simultaneously expanding opportunities for communication and engagement. In addition to broadening the reach of conservation messages, digital media also supports continuous informal learning by enabling audiences to access conservation

knowledge and interact with educational content beyond the constraints of time and place (Pamungkas, 2021). However, the findings suggest that Semarang Zoo still primarily utilizes social media as a tool for information dissemination. From a social innovation perspective, digital communication should also facilitate participation, dialogue, and co-creation of conservation knowledge. Digital media should not function solely as a channel for information dissemination but also as a platform for building trust, addressing public concerns, and fostering meaningful interaction with audiences (Maulina et al., 2026). Therefore, interactive conservation campaigns, visitor-generated content, myth-correction initiatives, and online follow-up educational activities could strengthen the integration of communication, education, and participation within Semarang Zoo's conservation programs.

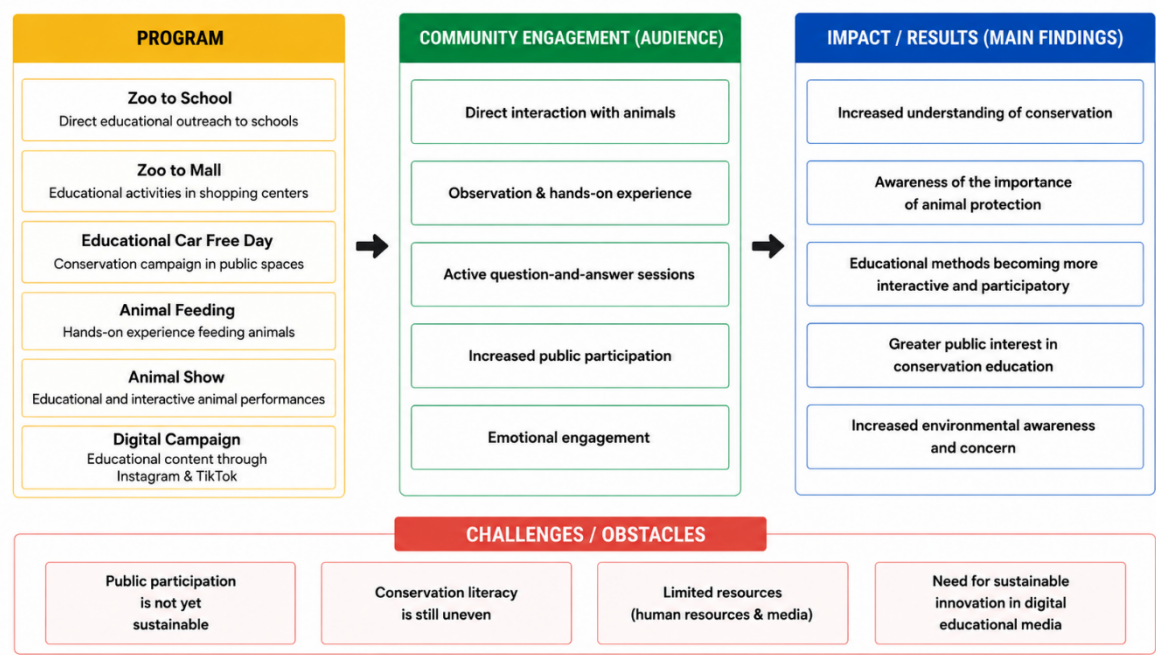
The edutainment approach implemented through animal shows and feeding activities further illustrates the integration of social innovation, communication, and education within Semarang Zoo's conservation strategy. By combining entertainment with educational messages, these activities create innovative learning experiences that make conservation concepts more accessible and engaging for urban audiences. Communication plays an important role in translating conservation knowledge into messages that are easily understood, while education provides opportunities for visitors to develop awareness through direct experience and interaction with animals. In this context, edutainment serves as a social innovation mechanism that bridges recreation and conservation learning. Environmental education becomes more meaningful when learning is connected to direct experiences within the surrounding environment, as such approaches can strengthen environmental awareness, responsibility, and ecological citizenship among participants (Herman et al., 2023; Kusnadi & Lutfi, 2023). Nevertheless, the findings reveal a potential limitation. While entertainment can increase visitor engagement, it may also reduce the effectiveness of conservation messages if audiences focus primarily on recreational aspects. Consequently, educational interpretation should remain central to these activities by emphasizing animal welfare, biodiversity conservation, and environmental responsibility.

The findings also indicate that the effectiveness of social innovation depends on the extent to which communication and education encourage meaningful public participation and collaboration. Effective tourism management requires collaboration among managers, visitors, local communities, and other stakeholders to support sustainable development and meaningful visitor engagement (Ayuningtyas et al., 2025). In Semarang Zoo's case, communication, education, and outreach activities have successfully expanded public engagement and increased opportunities for conservation learning. However, participation remains largely consultative and educational in nature, as communities and stakeholders are not yet substantially involved in planning, decision-making, or program evaluation. As a result, the social innovation generated by Semarang Zoo has not yet fully evolved into a collaborative governance model capable of sustaining conservation awareness through collective action.

Overall, the findings demonstrate that Semarang Zoo's conservation initiatives are best understood through an integrated framework that combines social innovation, participatory communication, and public education. Social innovation provides the overarching framework for addressing the social problem of limited conservation literacy, participatory communication functions as the mechanism through which engagement and interaction are facilitated, and public education serves as the learning process through which conservation knowledge and awareness are developed. Rather than operating independently, these dimensions interact through outreach programs, experiential learning activities, digital engagement, and edutainment practices. Consequently, conservation awareness emerges not merely from exposure to information but from participation in meaningful educational experiences. Although Semarang Zoo has developed a promising approach to promoting conservation awareness, the findings suggest that its initiatives are more effective in generating initial awareness and engagement than in demonstrating long-term behavioral change. Future efforts should therefore focus on strengthening participatory engagement, collaborative governance, systematic impact evaluation, and sustained educational follow-up to support lasting conservation outcomes.

Figure presents the integrated model of Semarang Zoo’s social innovation strategy in building conservation awareness through public education. The model demonstrates that conservation awareness is developed through a series of interconnected processes beginning with innovative educational programs, including Zoo to School, Zoo to Mall, Educational Car Free Day activities, Animal Feeding, Animal Shows, and Digital Campaigns. These programs function as social innovation initiatives designed to expand conservation education beyond the zoo environment and reach diverse segments of society. Through these initiatives, the public is encouraged to engage in direct interaction with animals, experiential learning, active participation, question-and-answer activities, and emotional involvement, creating meaningful learning experiences that strengthen audience engagement. This engagement process contributes to several outcomes, including increased understanding of conservation, greater awareness of animal protection, higher public interest in conservation education, and stronger environmental concern. At the same time, the model highlights several challenges that may influence the sustainability of these outcomes, such as inconsistent public participation, uneven conservation literacy, limited human and media resources, and the need for continuous innovation in digital educational media. Overall, the figure illustrates that conservation awareness is not generated solely through the transmission of information, but through the integration of social innovation, participatory communication, and public education, which collectively create opportunities for learning, engagement, and long-term conservation awareness.

Figure 6: Conceptual



Overall, the findings demonstrate that Semarang Zoo’s conservation initiatives are best understood through an integrated framework that combines social innovation, participatory communication, and public education. Figure X presents the conceptual model derived from this study, illustrating how conservation awareness is developed through a series of interconnected processes. The model begins with innovative educational programs, including Zoo to School, Zoo to Mall, Educational Car Free Day activities, Animal Feeding, Animal Shows, and Digital Campaigns, which function as social innovation initiatives designed to extend conservation learning beyond the zoo environment and reach diverse community groups.

The findings indicate that these educational programs do not directly generate conservation awareness. Instead, community engagement serves as the central mechanism linking educational activities to awareness outcomes. Through direct interaction with animals, experiential learning,

dialogue, question-and-answer sessions, emotional involvement, and active participation, conservation messages become more meaningful and personally relevant to participants. This finding supports participatory communication theory, which emphasizes that learning and social change are more likely to occur when individuals actively engage in communication processes rather than passively receive information.

As a result of this engagement process, participants demonstrated increased understanding of conservation issues, greater awareness of wildlife protection, stronger environmental concern, increased interest in conservation education, and more positive responses toward interactive learning approaches. However, these outcomes should be interpreted primarily as awareness-related outcomes rather than evidence of long-term behavioral change. While the findings suggest that Semarang Zoo's programs contribute to conservation awareness, this study does not provide empirical evidence that such awareness translates into sustained conservation behavior over time.

The model also identifies several challenges that may influence the effectiveness and sustainability of conservation education initiatives, including inconsistent public participation, uneven conservation literacy, limited human and media resources, and the need for continuous innovation in digital educational media. These challenges indicate that the success of conservation education depends not only on program design but also on organizational capacity, stakeholder commitment, and long-term engagement strategies.

From a theoretical perspective, the model contributes to the integration of social innovation, participatory communication, and conservation education frameworks, which have often been examined separately in previous studies. The model demonstrates that conservation awareness emerges not simply from exposure to information but through engagement-based learning processes facilitated by innovative educational practices and participatory communication. Consequently, Semarang Zoo can be understood not merely as a provider of conservation education but as a social innovation actor that creates opportunities for public engagement and environmental learning. Although the initiatives have successfully generated initial conservation awareness, future development should focus on strengthening participatory engagement, collaborative governance, systematic impact evaluation, and sustained educational follow-up to support longer-term conservation outcomes.

4. CONCLUSION

Based on the findings, this study concludes that Semarang Zoo has implemented educational and participatory communication strategies to support conservation awareness through various public education programs, including Zoo to School, Zoo to Mall, conservation education activities at Car Free Day (CFD) events, animal shows, animal feeding sessions, and digital communication initiatives. Viewed through Harold Lasswell's communication model, Semarang Zoo educators and managers function as communicators, conservation values constitute the core messages, educational activities and digital media serve as communication channels, and students, visitors, and the wider public represent the target audiences. The findings indicate that these communication activities contribute to increasing public knowledge, understanding, and awareness of wildlife conservation and environmental sustainability.

The findings further demonstrate that Semarang Zoo's conservation education initiatives can be understood as a form of social innovation. First, the programs respond to a social need, namely the limited level of public conservation literacy and environmental awareness. Second, innovation is reflected in the transformation of conservation education from a zoo-based activity into a more accessible learning process conducted in schools, shopping centers, public events, and digital platforms. Third, the programs emphasize participation and collaboration by actively involving students, visitors, educators, local communities, and institutional partners in conservation learning activities. Fourth, these initiatives generate social value by creating broader opportunities for environmental learning and fostering public awareness of conservation issues. These findings indicate that conservation education functions not merely as information dissemination but as a socially

innovative communication practice that connects conservation institutions with communities through participatory and experiential learning processes.

From a theoretical perspective, this study contributes to communication studies by demonstrating that conservation communication effectiveness is influenced not only by the delivery of messages but also by audience participation, interaction, and experiential engagement. The findings suggest that Lasswell's communication model remains useful for explaining conservation communication processes while highlighting the importance of participatory dimensions that strengthen communication outcomes. The study also contributes to social innovation scholarship by providing empirical evidence that communication processes can facilitate social innovation when they address social needs, encourage stakeholder participation, and generate social value through community-oriented educational initiatives.

The conceptual model developed in this study illustrates that conservation awareness is formed through an interconnected process linking social innovation, participatory communication, experiential learning, and public education activities. Educational programs act as innovation mechanisms that create opportunities for interaction and participation, while communication processes facilitate knowledge exchange and environmental learning experiences. Through repeated engagement across different educational settings, these processes contribute to the development of conservation awareness among participants. The model therefore emphasizes that conservation awareness is not produced through one-way communication alone but through continuous interaction between communicators, audiences, educational experiences, and social contexts.

In terms of educational implications, the findings suggest that conservation education should be integrated more systematically into both formal and non-formal educational environments. Schools can play a strategic role in strengthening environmental literacy through collaboration with conservation institutions that provide experiential learning opportunities and encourage active participation. In practical terms, zoos and conservation organizations are encouraged to strengthen participatory, experiential, and digitally integrated communication strategies to expand the reach and effectiveness of conservation education programs. Sustained collaboration among zoos, educational institutions, government agencies, community organizations, and media partners is essential to enhance the continuity and impact of conservation initiatives.

From a policy perspective, local governments are encouraged to support conservation education through environmental awareness programs, institutional partnerships, and public education initiatives. Policy support for cross-sector collaboration may strengthen the accessibility, sustainability, and long-term implementation of conservation education programs across various public settings.

Several limitations should be acknowledged. This study primarily examines communication strategies and participants' perceived learning experiences within Semarang Zoo's conservation education programs. The findings are based mainly on qualitative data and participants' perceptions; therefore, the study cannot establish causal relationships between educational activities and long-term behavioral change. Consequently, conclusions regarding behavioral outcomes should be interpreted cautiously. Future research is recommended to investigate the long-term influence of conservation education on environmental attitudes and behaviors, conduct comparative studies across different conservation institutions and regions, and explore how emerging digital technologies, social media ecosystems, and community-based communication models can further strengthen conservation awareness and public participation.

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