

Pentahelix Communication Model in Sustainable Village Development: A Study on Waste Management in Trangsan Village

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ABSTRACT

Keywords

Pentahelix Communication Model;
Sustainable Development; Waste
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The purpose of this study is to explore the involvement of the role of the Five Elements in sustainable village development in the Pentahelix model communication concept in waste management in Trangsan village. The research method used is descriptive qualitative, with data collection techniques through interviews, FGDs, observations and documentation. The result of this study shows that the role of the five elements in the Pentahelix concept has advantages in each dimension such as the government as a policy maker, the business world as a facilitator, academics as coordinators, the community as implementers, and the media as an accelerator and information publication. The sustainable development process requires good communication between individuals and groups to optimize their respective roles and jointly contribute to efforts to improve the quality of life of the community. Thus, the Penta Helix model of sustainable village development strategy can be an effective model for realizing Sustainable Trangsan Village.

1. Introduction

Sustainable village development is a crucial agenda in an effort to improve the welfare of the community in terms of social, economic and environmental aspects which must go hand in hand without sacrificing the needs of future generations. Referring to data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK), it shows that until July 2024, at least the waste pile from 311 districts/cities will reach 33.7 million tons. However, only 59.88% or 20.2 million tons of waste can be managed, which means more than 40% or 13.5 million tons that cannot be managed properly (SIPSN, 2024). Thus, it becomes a big threat if it continues to be left unattended while the garbage pile continues to increase.

Community development is also the reason for the excessive consumption pattern, which has an impact on increasing the volume of household waste stockpiles. Unfortunately, this increase in waste piles is not in line with an adequate waste management system (Firdausi, 2024). This makes waste management in rural areas inseparable from environmental issues, many areas in rural areas face challenges in environmental problems, especially in waste management and exacerbated by the lack of awareness and knowledge of good waste management. Based on data in the SIPSN owned by the Ministry of Environment and Forestry in 2024, the largest source of waste comes from households which reach 50.62% of waste in Indonesia consisting of various types of waste. (SIPSN, 2022). As can be seen from the data, the number of stockpiles in Indonesia in 2024 is still very high. Likewise

with the garbage pile located in the Eduwisata Ratan Trangsan Village Area, Gatak District, Sukoharjo Regency. Based on data from the Trangsan Village Waste Bank Unit, the number of waste piles from May 2023 to February 2024 reached 6,694.4 KG with an average of 600 kg of waste received per month. This number is not comparable to the total of the entire village, reaching 2504 heads of families spread across 10 RWs (Gatak Dalam Angka, 2024).

This condition was responded by the Trangsan Village government by showing its commitment to overcoming environmental problems. One of its commitments is to implement community development programs through cross-sector collaboration with the integration of communication collaboration with the Pentahelix Model. Pentahelix Model Communication Collaboration is a communication process that involves five key elements that hold interests, namely Government, Academics, Business, Community and the media (Palestho & Octanisa, 2023). This concept is important to apply to problems in the region where each key element has a diverse role and regional interests. Through the Pentahelix collaboration, it is hoped that a new idea supported by resources that interact synergistically can be realized. The five elements of the pentahelix category contribute and are interrelated.

Based on this concept, pentahelix collaboration must support the realization of the principles of sustainable development (Arif, 2024). In the context of sustainable village development, each key element no longer only focuses on its own goals but also pays attention to each community development process to environmental issues.

The principle of sustainable development does not only focus on each stakeholder's role, but also on its communication practices. Thus, study aims to analyze the role of five important elements in sustainable village development in waste management in Trangsan village through the Collaborative approach of the Pentahelix Communication Model which is reviewed from the pentahelix approach with 5 dimensions, namely, 1) Policy Creator, 2) Coordinator, 3) Facilitator, 4) Implementer, 5) Accelerator (Meutiasari et al., 2024). This means that this strategic communication does not only focus on the beneficiaries, but covers the entire development process starting from planning, implementation to the monitoring and evaluation stage which aims to encourage participation and active collaboration of each element (Setya Yunas, 2019). Collaboration The pentahelix model can be used as a reference to develop synergy between agencies to achieve target goals. The role of the five elements of Pentahelix has the goal of developing innovation and contributing to the socio-economic and environmental progress of the local area (Widowati et al., 2019)

This study tries to analyze how the communication pattern of the pentahelix model is applied to the process of sustainable village development through waste management in Trangsan Village by using the principles of communication strategies for sustainable village development. This study also looks at how the five key elements contribute directly to the community about environmental concerns, especially the negative impact of waste that is not managed completely. Ultimately, this research is expected to contribute to the evaluation of communication practices carried out by the five key elements of pentahelix.

2. Method

This study uses a qualitative descriptive method that aims to explore in depth the contribution of five key elements to the communication strategy of the pentahelix model in the process of sustainable village development. Data collection methods were collected through Farum Group Discussions (FGDs), field observations, in-depth interviews, and documentation. A qualitative approach is used to explore reality by exploring data in depth. Case studies or use a variety of sources to comprehensively explain aspects of a group, individual, organization or program (Kasiram & Idris, 2010). Resource persons are determined purposively involving representatives in each key element of the Government, academics, business, community, and media, who are involved in the implementation of waste management and village development activities. The validity of the data is maintained by triangulating sources and methods, then re-checking is carried out through membercheck to the main informant. Data analysis using interactive models from Miles, Matthew.B;

Huberman, (2002) which includes data reduction, presentation, and conclusion and verification based on the five dimensions of pentahelix strategic role mapping: policy creator, coordinator, facilitator, implementer, and accelerator.

3. Result and Discussion

This research in data mining seeks the application of five dimensions in strategic communication for sustainable development. The resource persons taken are those who are in charge of making policies in each element of Pentahelix. Overall, this study observes the role of the five pentahelix elements on each dimension in sustainable village development, especially in waste management. The main findings of this study are based on a descriptive qualitative approach that has been carried out through Forum Group Discussions (FGD), interviews, field observations and documentation. All findings were analyzed thematically with reference to the five dimensions of the pentahelix communication model: Policy creator, coordinator, facilitator, implementer, and accelerator.

In the application of the Pentahelix model communication in sustainable village development which refers to waste management in Trangsan Village, each role of each element such as the government, academics, business actors, community and also the media has an important contribution that is distinctive and different in each dimension of sustainable development. Mapping each element is important to know how this communication and collaboration strategy is integrated. Then the results presented are a representation of the contribution of each key element of the pentahelix that contributes to the development of a sustainable village focused on management studies in Trangsan Village. The presentation of results is carried out systematically to show collaboration patterns and communication strategies, as well as to be a basis for reflection in efforts to strengthen synergy across sectors.

Pentahelix Collaboration in Waste Management

Based on the data collected, the five key elements of the pentahelix collaboration involved do indeed show complementary roles according to their respective sectoral roles. However, after further analysis, researchers found variations in the level of role optimization and a tendency for shifting functions in several dimensions.

There is a shift in the Policy Creator dimension, the Trangsan Village Government plays a dominant role and carries out its duties very well. The government as the main actor in formulating regulations that favor environmental management, including through the formulation of village policies that are legal-formal, such as the waste retribution payment system. The policy is not made unilaterally by the Trangsan village government but involves other elements. The regulation is made based on consensus and supported by input from other parties. Academics provide research-based and scientific data, while business actors and the media provide perspectives and policy input. This is the basis for determining the direction of policy. As conveyed by an academic informant:

"Our empowerment team has conducted field surveys and also participatory community mapping before the village government makes policies. The data will be used in the village deliberation forum," (interview, head of the UMS empowerment team, May 7, 2024).

Other elements such as the media also join in the policy creator dimension by spreading environmental issues to the village community, which indirectly influences the discussion agenda in the village deliberation. Not only the media, but the community is also involved in the discussion of the village deliberation. However, the participation of the media and the community in the process is still passive, more as an aspirator, not as a policy co-creator. This shows that the participatory dimension of the community in policy formulation is not yet optimal.

Then in the coordinator dimension, it is clear how the contribution given by academics plays a fairly central role and carries out their duties and authorities well as drivers of military collaboration. Through discussion forums, academics facilitate inclusive collaboration meetings and planning. The FGD was held in June 2024 involving all Pentahelix elements and resulted in a cross-sector cooperation agreement. The village government also plays a fairly dominant role in the administrative coordinator, ensuring smooth bureaucracy and administrative follow-up of the

discussion results. Meanwhile, the role of the media is tasked with disseminating the results of coordination through the Village media platform and social media.

"We are responsible for designing the coordination scheme and drafting the MoU for collaboration between partners, including the Community and CSR," (interview, Academic Team, June 2, 2024).

The quality of the effects of activities on this dimension, although the actors carry out their duties and authorities well, is still felt to be less than optimal due to the limitations of formal events, and also the many cultural differences between each party in carrying out coordination, making this pentahelix collaboration need to adjust communication patterns more often so that they are embedded in the daily lives of the actors.

The facilitator dimension, business elements contribute greatly through the provision of equipment facilities and also technical training. CSR programs from business partners in the form of shredding machine units, sorting containers, and also basic waste management training for operators of the main Trangsan Village Waste House. This training involves the community, especially in the Waste Bank Unit group, village youth organizations and also PKK cadres.

"We received in-Cash and In-Kind funding assistance from both internal and external village companies and received technical training on how to operate it. This really helps the waste management process to be more optimal," (Interview, Manager of the Main Waste House of Trangsan Village, August 3, 2024).

In addition to business elements, academics are also involved in increasing the capacity of managers and the community through module-based training and also creative digital content involving youth organizations. Meanwhile, the media publishes facilities and educates the community through these publications. The role of business elements here is very significant as facilitators, but there is still a tendency for dominant roles that create dependency. The role of academics and the media also plays a role in mentoring and socializing sustainability. In this dimension, there needs to be an increase in the involvement of community elements as local facilitators for the sustainability of the program.

In the Implementor dimension, of course the dominant role of the community in carrying out this dimension, the community shows its contribution through direct action in the field and acts as an initiator of environmental action. Environmental actions such as mutual cooperation, social service, caring for the environment together, and waste management from its origin have shown a high level of participation.

"Every first Sunday of every month we work together to clean the village and also care for the environment, for waste deposits, usually every week there will be officers from the village Waste House who will weigh the waste at the RW Waste Unit," (Interview, Resident of RW 9, August 11, 2024).

The government encourages this by providing logistical facilities and moral support through local community leaders. While academics play a role in monitoring activities, the media contributes to documenting and disseminating information about activities. In this dimension, it was found that business actors took on the role of implementers (for example in operating equipment) which should be better carried out by the community with the support of training modules and guidance so that the sustainability of the program does not depend on a particular sector.

Then in the accelerator dimension. All sectors play an active role, but the role of the media dominates in this dimension and carries out its duties very well and effectively in disseminating information aimed at spreading the narrative of behavioral change. The publication of digital creative content through platforms used as a means of education and awareness campaigns for community behavior towards waste management has encouraged increased public awareness.

"We make Creative videos about Community Activities and also education about the importance of inspiring waste management. It is displayed on social media and also at village activities," (Interview, Karang Taruna Village, August 3, 2024).

Academics help accelerate the process of disseminating information through digital innovation, and village governments provide social incentives to encourage community participation. Business actors also expand programs to the recycling sector as an effort to increase community income based on a circular economy.

The community/society as a catalyst for change has been proven to experience significant improvement, but in this accelerator process it needs to be further encouraged to become a center of innovation, not just an object of change. In addition, there are several things, such as academics and the media that emphasize too much on the speed of program distribution without considering the readiness of the community to get used to change, so that it can cause resistance in the field. Overall, each key element in sustainable village development has played a role and contributed well and within the pentahelix framework. However, there are still evaluations that need to be improved in terms of role clarity, role balance, and role sustainability. The evaluations found include role balance that causes inequality and limitations such as the role of government and business actors, followed by strong community involvement in the field but weak when involved in the policy and evaluation space. There was also sensitivity to the role of academics and the media even though they had made a major contribution. Then the evaluation of program ownership by the community re-emphasized what the sustainability of the program is like in the long term. This certainly requires further efforts to build a collaborative model strategy that not only focuses on structured integration but is also transformative in building collective awareness and high participation harmonization.

Analysis and Evaluation The Role Of Pentahelix Model

Table 1. Contributions From the Five Main Actor Dimensions

TABLE OF CONTRIBUTION					
Dimensions	Government	Academy	Business	Community	Media
Policy Creator	✔ Policy formulators and local decision-makers (Perdes), facilitators of deliberative forums.	✔ Provider of academic manuscripts and data-driven inputs.	○ Providing the perspective of business actors at the policy forum.	○ Convey aspirations and needs at the citizen level.	○ Disseminate policy information to the public.
Coordinator	✔ Technical and administrative coordinator of cross-sectoral programs.	✔ FGD facilitator, compiler of coordination schemes and role mapping.	○ Discussion partners in technical planning.	○ Community group coordinator in the field.	○ Disseminating information on the results of coordination and activity schedules.
Facilitator	✔ Budget providers and activity venues, public facility support.	✔ Compiler of training modules and technical assistants.	✔ Provider of tools, technical training, CSR support.	○ Beneficiaries and users of facilities.	○ Promotion of the use of facilities, educational campaigns.
Implementor	✔ Organizing and supervising implementation at the village level.	✔ Evaluators and companions during the implementation process.	○ Results-based incentive providers, waste bank partners.	✔ Key implementers: sorting, managing, and recycling waste.	○ Document and publish the implementation process.
Accelerator	✔ Compiling incentives, accelerating policy adoption and replication.	✔ Developer of digital reporting system innovation.	✔ Program expansion through business partnerships and networks.	✔ Agents of change and spreaders of good practices.	✔ The main actor is the dissemination of success stories and public education.

The results of this study confirm that the pentahelix model communication approach in sustainable village development not only produces coordinated communication patterns but is also adaptive to the local context. This is reinforced by the results of research by (Meutiasari et al., 2024), which states that the application of the five dimensions in the Pentahelix collaborative communication model is able to accelerate the process of sustainable development. Communication is not only a tool for information transactions, but also functions as a mechanism for coordination, consensus and negotiation that allows the birth of common goals regarding sustainable development. In the triple helix concept that emphasizes the importance of dynamic interaction between stakeholders in social innovation (Cai & Etzkowitz, 2020). However, this is different from previous studies that focused more on the dominant role of one element. The results of this study actually found that the distribution of mapping of each role was relatively proportional, although still with dominance according to each sector.

The presence of each element in each dimension in the pentahelix communication model creates richer horizontal and vertical communication. In contrast to the findings put forward by (Meutiasari et al., 2024), By considering communication as part of information distribution, this study shows the importance of communication that functions as a dialogical forum that strengthens synergy between key elements. In this context, the communication strategy implemented is not linear, top-down communication, but rather communication that involves many directions, where each element has space to voice aspirations and influence decision-making. According to Everett M Rogers (2003) dan Hemer & Tufte (2005) recognizes that the top-down approach creates limitations in the development process and begins to encourage a participatory approach and based on local wisdom so that participatory communication and direct implementation will be more effective and sustainable. This can be seen in the FGD process which becomes a forum for deliberation, so that there is an egalitarian exchange of ideas between parties. Pentahelix is also a strategy that emphasizes the importance of interpersonal communication and communication based on local social relations, which are rarely explored in previous social development research.

The differences in the contribution of each element to the pentahelix dimension can indicate that this communication strategy is distorted, it is impossible for the five elements to play a dominant role in each dimension. This is supported by the view that development communication needs to be participatory and contextual (Schubin et al., 2020). The adjustment of communication patterns based on the contribution of each element is what makes the pentahelix strategy able to answer sustainable development problems such as waste management in Trangsan Village. Thus, this study contributes to a new understanding of how pentahelix model communication not only supports the collaborative approach process, but also as a structure that binds the direction of common goals and minimizes conflict between key elements. which includes data reduction, presentation, and conclusions and verification based on the mapping of the strategic roles of the five dimensions of the pentahelix: policy creator, coordinator, facilitator, implementer, and accelerator.

4. Conclusion

This study reveals that the application of the pentahelix model communication strategy can strengthen cross-sector collaboration in the sustainable development process, especially in waste management in Trangsan village as an effort to improve the quality of life of the community. With a five-dimensional approach, namely, policy makers, coordinators, facilitators, and accelerators show complementary contributions, although there are differences in interests and different role dominance in each dimension. The discussion shows that strategic communication is a binder between elements, not only the dissemination of information, but also a space for dialogue and negotiation that can produce policy formulation, coordination of implementation, and acceleration and publication of results. This provides a new perspective in the study of social development and multi-stakeholder collaboration, which emphasizes the importance of communication not only functionally but also structurally. This study contributes to expanding the understanding of the pentahelix communication model in a previously limited local context and offers a communication strategy model that can be applied to encourage direct community participation and sustainability. In the future, research on a similar scale can be expanded to other development-based issues by involving digital communication channels and technology-based approaches to test the effectiveness of the pentahelix model communication strategy in a broad context.

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