

THE ROLE OF YOUTH ENGAGEMENT, EDUCATION, COMMUNITY BUSINESS AND COLLABORATION IN THE TRANSITION TO A SMART VILLAGE

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Received 20 07 2025; Accepted 30 07 2025

Abstract

The decline in the rural population and the weakening of vitality are pressing issues, which scientists associate with the migration of young people to cities and the weakening of social and economic structures. Research and practice show that one of the sustainable solutions may be the transition to a smart village. This is recognized as an effective practice in the EU, but its potential has not yet been sufficiently revealed and exploited. The authors took the view that smartness is a goal, where local community organizations raise the level of governance and take targeted action to achieve smart status. A systematic analysis of the study was performed based on the PRISMA 2020 methodology (Moher et al., 2021). This article identifies the role of youth engagement, education, community business, and collaboration in the development of smart villages. The factors are closely interrelated and complementary, and their integration forms subsystems for the transition to a smart village. A conceptual spiral model of transition to a smart village has been developed, consisting of six stages linked by three main axes: social mobilization, strategic planning, and innovation integration. The principles of community business organisation can be applied in smart village strategies to ensure the transition to a smart village.

Keywords: Smart Village, Youth Engagement, Education, Community Business, Collaboration.

JEL Codes: R58, Q01, O18, M53.

Introduction

The Lithuanian Rural and Agricultural Development White Paper “National Policy Challenges, Tasks, and Actions until 2030” (2019) notes that population decline leads to a reduction in the economic potential of rural areas, a decline in the public service network, a decrease in quality of life, and makes it more difficult to restore human resources. In order to halt these processes and strengthen the vitality of rural areas, it is necessary to encourage the return of emigrated citizens and attract new residents from cities (Council of the European Union, 2024). The Organisation for Economic Co-operation and Development (OECD, 2021) emphasizes that in addressing the challenges facing rural areas, it is necessary to promote rural development policies that ensure prosperous, well-

connected, and inclusive rural communities that offer a higher quality of life than before. Some of the most important tasks of this policy are smart rural development management decisions, support for lifelong learning for young people and experienced workers, and the promotion of community business development. According to data from the official smart rural development information platform (Smart rural, 2021), the creation of community businesses is one of the smart solutions for implementing rural development strategies in Europe. The initiative encourages rural residents to unite for a common goal – to develop community businesses, use local resources, and implement innovative technologies, thereby contributing to the strengthening of the local economy and improving the quality of life.

The causes and consequences of youth migration from rural areas to cities have been

analyzed by authors from various countries: Șerban, Brazienė (2021), Sterie (2022), Schorn (2023), Atkočiūnienė, Šimkienė (2023), Ramos, Calmaestra, Vargas (2025) and other. Schorn (2023) examined various aspects of strengthening rural vitality and assessed regional development for young people in Germany and Austria. Pakeltienė, Atkočiūnienė, Kiaušienė et al. (2015) studied the development of rural social infrastructure with a view to ensuring territorial and social cohesion. Głębocki (2023) analyzed the strengthening of rural vitality through the digitization of the smart village concept and social innovations. Creineanu, Parnus, Marcuta (2024) studied the application of the LEADER method and the links between local policy and the well-being of the population. Pérez, Cambra-Fierro (2021) analyzed examples of smart villages in Europe. However, there is still a lack of a systematic scientific approach and strategies, and the available local potential remains largely untapped.

The authors of this article previously conducted a study in rural Lithuania, which found that the implementation of smart solutions is complicated by a lack of social initiatives, insufficient youth engagement, gaps in education, and limited collaboration with the business sector (Atkočiūnienė, Šimkienė, 2023). The results of this study became the basis for further analysis and the structure of this article.

The aim of the study is to create a conceptual model for the transition to a smart village based on youth engagement, education, community business, and collaboration.

The scientific problem is formulated as a question: what role do youth involvement, education, community businesses, and collaboration play in the transition to a smart village? The analysis is based on the PRISMA 2020 methodological standards (Moher, 2021) and the systematic content analysis method. The analysis examines the possibilities for smart rural development through community-based business, engaging young people, and ensuring the provision of educational services in collaboration with local and regional authorities, businesses, other villages, cities, European institutions, and partners. These

factors are also identified in the official smart villages initiative platform (Smart rural, 2021) as important components of strategic decisions for smart villages.

Literature reviews

The involvement of young people in smart villages was analysed by researchers Șerban, Brazienė (2021), Sterie (2022), Schorn (2023), Atkočiūnienė, Šimkienė (2023) Ramos, Calmaestra, Vargas (2025). They noted that youth involvement is one of the essential, mostly horizontal, conditions that help ensure the vitality of villages, as it is the younger generation that can take the initiative, creatively implement innovations, and contribute to the long-term sustainability of the community. It also helps them to start families and plan for the future in rural areas. In this article, youth is defined as individuals aged 14–29 years, integrating the definitions proposed by Șerban, Brazienė (2021) and the Council of the European Union (2024). The lower age threshold is justified by the fact that some young people leave rural areas before even completing school, seeking better educational and professional opportunities elsewhere. Ensuring access to quality education and opportunities locally can encourage them to remain in villages and, once they finish school, to engage in entrepreneurial activities, create families, and contribute to the vitality and sustainability of the community. Young people are recognized for their creativity, innovative potential, rapid learning, and decision-making abilities, as well as their capacity to adopt new technologies and acquire specialized skills more quickly than older generations. Their active participation in local decision-making, economic initiatives, and social life not only strengthens local economies but also fosters social cohesion, technological adoption, and long-term development of smart villages.

The role of education in the development of smart villages has been examined by Mańkowska, Szałata, Derlukiewicz (2023), Mukti, Iacob, Aldea et al. (2021), Huda, Dirgatama, Permansah, et al. (2024) and others. According to scientists, education and training are extremely important in the development of smart villages, as local residents

need to acquire the skills necessary to carry out specific activities or local businesses. These may include IT, foreign languages, community business organisation or other practical skills. Specialised training or competence development courses, both remote and face-to-face, can be provided by businesses and universities that are involved in the development of smart villages. Also, if needed, certain topics or subjects can be integrated into formal education in general education schools.

According to Atkočiūnienė, Šuliokienė (2024), Kučinskienė (2022) and Volodkevičienė (2022), community business involves many local residents and which is focused on strengthening social inclusion through the promotion of employment, the identification of the needs and opportunities of various social groups, the development of skills, the preservation of local identity, and the development of tourism and other local services. Jeon, Choi, Vaquero (2024) and Celeste, Resurreccion (2024) argue that community business combines profit-seeking activities with social missions, seeking to address economic and social problems such as employment, environmental protection, education, promotion of local businesses, provision of social services, and community development. The researchers also emphasize that the successful development of community-based business requires collaboration with regional authorities, which could purchase services and help regulate their activities.

According to Mańkowska, Szałata, Derlukiewicz (2023), Mukti, Iacob, Aldea et al. (2021), Jezic, Górecka, Kardum (2021), Sikos, Szendi (2022), and others, consistent collaboration is one of the most important principles of smart village development. For example, businesses can contribute by organizing training, purchasing services from local communities, creating marketing strategies to attract tourists, and implementing joint projects. They can also share resources and supply the raw materials and material resources needed to develop local initiatives. Government institutions can contribute by institutionalizing and legalizing the activities

implemented by smart rural communities, promoting their development, and providing support, while educational institutions can contribute by developing the learning process and educating the rural community.

Methodology

The work involved empirical research assessing the factors influencing smart rural development and a systematic analysis. The aim was to answer the main research question: what role do youth engagement, education, community businesses, and collaboration play in the development of smart villages? In the final stage of the study, based on the results of the analysis, the aim was to create an integrated conceptual model for the transition to a smart village.

The study was conducted in accordance with the PRISMA 2020 methodological guidelines (Moher, D., 2021), which include a systematic literature search, analysis of studies, and presentation of results. The following bibliographic databases were used to search for scientific publications: Google Scholar, SAGE Journals, ScienceDirect, EBSCO, as well as the official smart villages platform – SMART RURAL 21. The databases were selected based on their availability and thematic relevance. The following keywords in Lithuanian and English were used to search the literature: smart village development, youth engagement, education, collaboration, community business in rural areas. A total of 60 scientific articles were identified, of which 8 articles were selected for the final systematic analysis (see Fig.1).

The systematic analysis selection included peer-reviewed articles in English and Lithuanian. The sources had to correspond to the research topic – aspects of smart village development, cooperation, youth involvement, education, and community businesses in Lithuania or internationally. The documents had to be published before 2025. Only studies that met the following criteria were included in the systematic analysis:

- analysis of conditions favorable to smart rural development;
- analysis of examples of good practice in smart rural development.

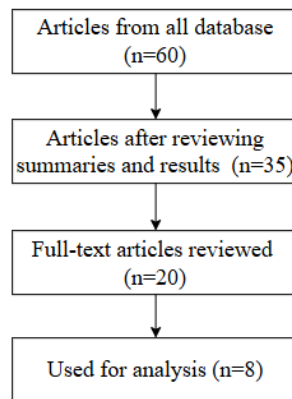


Figure 1. The PRISMA Flowchart: systematic analysis - components of the conceptual model for transitioning to a smart village

All articles analyzed the factors and conditions that promote the development of smart villages. Three of them also examined examples of success, while four emphasized the advantages of smart villages in the context of rural vitality and sustainable development.

Based on the results of the analysis, a conceptual model for the transition to a smart village was developed, comprising four components: goals and forms of youth engagement; educational initiatives and forms; goals of existing (or potential) community businesses; collaboration goals and forms; and the axes of the transition process: social mobilization, strategic planning and innovation integration.

Results

The analysis of scientific sources aimed to clarify how scientists evaluate the concept of community business, youth engagement, education, and collaboration in the development of smart villages. The table below (Table 1) presents the results of eight studies included in the systematic analysis.

It was noted that in all the sources analyzed, community business is identified as one of the strongest drivers of smart rural development. This is particularly relevant in cases where the majority or even the entire rural community supports the idea

of smart rural development and is actively involved in the creation of local businesses and the consumption of services. Although not all sources directly use the term "community business," all clearly describe the characteristics of such a structure. For example, Mańkowska, Szałata, Derlukiewicz (2023) found that the development of community business not only contributes to improving the quality of life of residents, strengthening the local economy, and preserving the natural environment, but also strengthens residents' motivation, community spirit, activity, and focus on a common goal. The article recommends establishing community collaboration centers and creating online collaboration platforms. Mukti, Iacob, and Aldea et al. (2021) note that the creation of community-based businesses through the development of smart villages is particularly relevant, as it can become a major source of economic benefit for residents of declining rural areas. To this end, smart service platforms should be created and a motivational system should be developed to encourage residents to get involved and reduce resistance to change. According to Zhang, Zhang (2020) and Huda, Dirgatama, Permansah et al. (2024) argue that the involvement of local communities in the development of smart rural businesses increases the likelihood of success, as residents become motivated, know their rural area and local resources best, and have assets in

which to develop their activities. Głębocki (2023) reveals the concept of community business as a social-organizational element, emphasizing the participation of residents in the development of rural communities, the importance of public-private partnerships, and the strengthening of traditional social relationships. The researcher also notes that key factors influence the sustainability of rural development. Creineanu, Parnus, and Marcuta (2024) argue that the involvement of local communities promotes social innovation and social change in rural areas, which has a positive impact on rural vitality.

Education helps shape the skills that local residents need to effectively engage in social, economic, and technological change. In each of the sources analysed, the development of community business and the involvement of local residents in smart rural development are closely linked to consistent community education and capacity building. Emphasis is placed on interdisciplinary training covering technology, IT, social skills, management, and other aspects that help to adapt to modern challenges (Huda, Dirgatama, Permansah et al., 2024; Zhang, Zhang, 2020; Creineanu, Parnus, Marcuta, 2024).

The sources emphasize the need to strengthen the skills that residents already have and to provide them with new ones (Mańkowska, Szałata, Derlukiewicz, 2023), while digital literacy and technological harmony are becoming important in the context of service provision and community empowerment (Mukti, Iacob, Aldea, et al. 2021). Training should cover all segments of the population (Jezic, Górecka, Kardum, 2021). In addition, the development of certain basic skills—entrepreneurship, organization, civic engagement—could begin as early as kindergarten, so that the competencies necessary for active and responsible participation in the creation of a smart rural community are nurtured and shaped from an early age.

The phenomenon of youth engagement in the development of smart villages is defined in the analysed sources through the main strengths of

young people: receptiveness to innovation, creativity, entrepreneurship, contribution to maintaining the rural population by starting families, choosing a sedentary lifestyle, and contributing to the revitalization of rural areas (Mańkowska, Szałata, Derlukiewicz, 2023; Mukti, Iacob, Aldea, et al., 2021; Jezic, Górecka, Kardum, 2021; Huda, Dirgatama, Permansah, et al., 2024; Zhang, Zhang, 2020). All eight sources analyzed emphasized the importance of bringing young people back to villages and engaging them, stressing that the younger generation can become the main driving force in introducing innovations, strengthening the local economy, and ensuring long-term rural development. It was also emphasized that in order to encourage young people to return to rural areas, it is necessary to improve the quality of life: leisure, jobs, quality and availability of services, convenient infrastructure, mobile communications, etc.

Furthermore, all sources analyzed emphasized that consistent and continuous collaboration is essential for smart rural development. According to Mańkowska, Szałata, Derlukiewicz (2023), Sikos, Szendi (2022), Głębocki (2023), collaboration with businesses that can purchase local products or services, train rural residents, share best practices, and help resolve emerging issues is particularly important. Mukti, Zhang (2020), Jezic, Górecka, Kardum (2021) emphasize the importance of connections with cities. Creineanu, Parnus, Marcuta (2024) highlight sustainable cooperation between citizens, government, business, and academic institutions.

When analyzing the possibilities of transition to a smart village, four groups of components were selected and approved: 1) youth engagement goals and forms; 2) educational initiatives and forms; 3) goals of existing (or potential) community businesses; 4) collaboration goals and forms. A systematic analysis was carried out, i.e. significant statements were identified based on the conditions favorable to the development of smart villages and their characteristics (Table 1).

Table 1. The role of youth engagement, education, existing (or potential) community businesses, and collaboration in the context of smart village development

Authors/dimensions	Youth engagement goals and forms	Educational initiatives and forms	Goals of existing (or potential) community businesses	Collaboration goals and forms
Mańkowska, D., et al. (2023).	<i>Not directly mentioned, but can be interpreted from the context</i> resident participation; community empowerment; IT tools.	<i>Not directly mentioned, but can be interpreted from the context</i> innovative measures to address local challenges; IT measures; strategy development.	Improving the quality of life of residents; strengthening the economy; empowering the community; preserving the natural environment; entrepreneurship among local residents; alternative energy sources.	The role of public authorities in supporting local development; resident participation; community empowerment; collaboration; strategy development; innovative measures to address local challenges.
Mukti, I, Y, et al. (2021).	Return/attraction of residents (<i>indirectly includes the return of young people to villages</i>); Digitally empowered citizens (<i>often primarily includes young people, especially in the IT context</i>).	Training; Digitally empowered citizens (<i>result related to learning and skills development</i>).	Economic benefits – attracting residents; Creation of a smart services platform (<i>if used as community or social business tools</i>).	Relationships between stakeholders (<i>citizens, government, local authorities, private sector, academia</i>); Participatory governance; Cooperation and communication platforms; Creation of smart village service platforms (<i>based on interaction between institutions and citizens</i>).
Jezic, Z., et al. (2021).	<i>Indirect link:</i> preserving villages and their inhabitants may be indirectly linked to efforts to stop youth migration, i.e. creating conditions for them to stay or return.	<i>Indirect link:</i> The use of local potential may include the activation of local knowledge, traditions, and skills related to local knowledge, learning, and competence building.	The use of local potential.	The use of local potential to overcome contemporary challenges.
Sikos, T., et al. (2022).	Creative initiator – social innovator (<i>may be related to the role of young people, as social innovations are often initiated by active young people</i>). Continuously learning community (<i>may include all age groups, including young people</i>).	A community that is constantly learning; Governance and education (<i>smart governance and education</i>).	Smart Economy (<i>use of local resources, innovative businesses</i>) Creative initiator – social innovator (<i>may be a community business creator</i>)	Collaboration; Creative initiator – social innovator (<i>often initiates collaborative activities</i>); Smart Governance
Huda, C., et al. (2024).	<i>Indirect link:</i> Young people are often more willing to use and adopt technology, so	Digital literacy Technology (<i>in terms of its application and skills development</i>).	<i>Possible indirect link:</i> Technology as a means of creating or strengthening community	<i>Indirect link:</i> ICT implementation often requires collaboration between local authorities, service

	developing technology and digital literacy can be one way to encourage their participation.		businesses (e.g., e-commerce, digital services). ICT development enables remote service delivery and opens up opportunities for new business models.	providers, communities, and universities.
Zhang, X., et all. (2020).	<i>Indirect link:</i> Social subsystem.	<i>Indirect link:</i> The information subsystem can be interpreted as related to the dissemination of information, learning, and strengthening of competencies.	Economic subsystem; Resource and environmental subsystem (local resources can be used for business); Activity level (practical community activities, including business).	Social subsystem; Strategic level (often involves coordination between various stakeholders).
Głębocki, K. (2023).	<i>Indirect link:</i> Lifelong learning and improving IT skills (may be relevant to young people as the main digital group). The development of tourism (theme parks) may be an attractive business/leisure niche for young people. Remote work is often relevant for young people, especially those returning to rural areas.	Adapting formal education to the challenges of smart village; Improving IT skills; Lifelong learning.	Tourism development (theme parks); Economic development; Remote working; Public-private partnerships (also related to business initiatives).	Residents' participation in rural community development; Public-private partnerships; Strengthening traditional social ties.
Creineanu, L., et all. (2024).	<i>Indirect link:</i> social change, local development – may involve youth participation (especially if innovative activities or local initiatives are included).	<i>Indirect link:</i> Innovation often involves the dissemination of knowledge, learning, and skills development.	Economic changes; Use of local resources; Innovations.	Local development strategy (usually implemented through partnerships between the community, business, and government); Social change (related to strengthening social ties and collective initiatives).

The authors took the view that smartness is like a goal, where local community organizations raise the governance bar and take purposeful action to achieve smartness status (Martinaitis, 2021), which is marked with the number 6 in Figure 2. Based on an analysis of scientific literature sources, three axes of the transition to a smart village were

identified, which help to see the transformation: social mobilization (empowerment, participatory governance, social capital); strategic planning (local strategies, data-driven decisions and services, planning platforms); integration of innovation (technology, IT solutions, networking, living laboratory) (Figure 2).

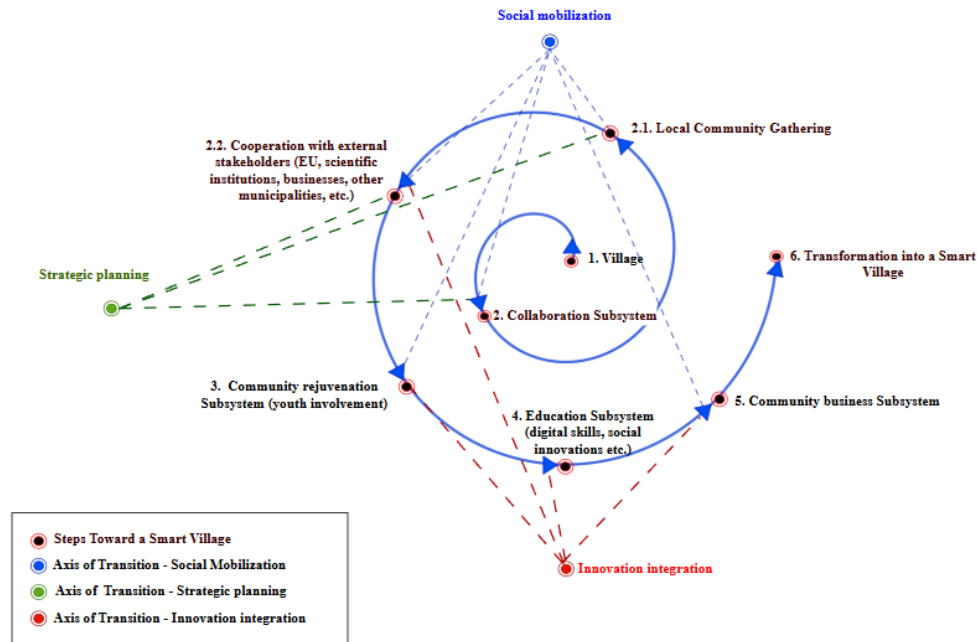


Figure 2. Conceptual spiral model of transition to a smart village

In the conceptual model, the red color marks the axis of innovation integration, which combines the steps involved in the transition to a smart village: collaboration (because stakeholders are needed to create and implement innovations), youth involvement and participation (because young people are quick to grasp innovations, etc.), community entrepreneurship (because it empowers the local community, helps to create and provide local services, and use innovations). The blue color marks the axis of social mobilization, which combines the following steps: community participation, youth involvement, community business, and cooperation. The green color marks the strategic planning axis, which combines community involvement (because the community itself strategizes) and cooperation (because various partners contribute).

In the conceptual model of transition to a smart village, the authors identify and confirm through literature analysis the components of a smart village 1) goals and forms of youth engagement, 2) educational initiatives and forms, 3) goals of existing (or potential) community businesses, 4) cooperation goals and forms, - help to form certain subsystems of the village, which is a socio-economic system managed by organizations

(Fig. 2). Each subsystem has its own goals, forms, and actions (Table 1), which shape their role in the transition to a smart village.

The objectives of the education and learning subsystem are competence development, digital literacy, and lifelong learning. Forms: formal and informal education, training, living laboratories. Activities: learning, education, IT skills, living laboratory, strategic training, continuous improvement.

The objectives of the community entrepreneurship and innovation subsystem are to strengthen the local economy, provide innovative services, and utilize local resources. Forms: social enterprise, circular economy, local services, tourism, remote work. Activities: community businesses, local resources, economic change, innovation, LEADER, tourism, digitization.

The objectives of the youth inclusion subsystem are empowerment, re-emigration, and participation in creation. Forms: youth entrepreneurship, inclusion in communities, improvement of quality of life. Activities: youth, return to the countryside, involvement, creation, innovation.

The objectives of the collaboration subsystem are inclusion, participation, partnerships,

and networking. Forms: community platforms; links between the public, private, non-governmental, scientific, and educational sectors. Activities: cooperation, citizen participation, partnerships, community involvement, coordination.

Conclusions

1. The study revealed that the factors selected for analysis—youth involvement, education, community business, and collaboration—are closely interrelated and complementary, and are important for the transition to a smart village. Their mutual integration forms subsystems for the transition to a smart village. Youth involvement and participation in the management of rural change is considered an essential horizontal condition for creating innovation, making smart decisions, and quickly adapting to ICT and other technological changes. The engagement of young people in local development processes at the local level helps to stop negative migration processes, strengthens the sense of community, and encourages the emergence of new ideas. It is important to note that the results of this study support the conclusion formulated in the authors' previous study—in order to encourage young people to return to rural areas, it is necessary to improve the quality of life.

2. Education in the context of the transition to a smart village is a principle of rural development management that shapes the education and learning subsystem, usually manifested through collaboration with businesses, other rural and urban communities, formal and informal educational institutions, and participation in various European Union initiatives. Education provides the necessary knowledge and skills when new technologies are applied to implement business and environmental solutions.

3. Community-based business empowers local residents to independently address economic and social challenges by using local resources and strengthening social responsibility. Rural communities are often most familiar with the specifics of the area, its needs, traditions, and

available resources. Residents often have access to local assets, so they are motivated to initiate and develop businesses, seeking not only material well-being but also a consistent improvement in their quality of life. Collaboration with institutions, local and rural communities, and the implementation of international projects help to ensure the availability of resources, the dissemination of innovation, and long-term sustainability.

4. Based on the summarized research data, a conceptual spiral model for the transition to a smart village was developed, consisting of six stages linked by three main axes: social mobilization, strategic planning, and innovation integration through education and training, collaboration (e.g., joint strategies with regions, cities, networks at the national and EU levels), youth involvement and community participation (in strategy development), community business (social, bioeconomic business, etc.) development, and other rural development governance principles. In smart village strategies, the principles of community business organisation can be adapted to ensure the transition to a smart village.

Research Limitations and Future Directions

The study is based on a systematic analysis of eight articles, which represents a relatively small sample, given that smart village development is still a relatively new research area. These articles covered the key components under investigation, but future studies could expand the literature base to include additional sources for a more comprehensive understanding. The analysis could also be strengthened by integrating practical examples of successfully implemented smart villages. Moreover, the proposed conceptual model has not yet been empirically tested. Future research could include empirical and comparative studies to examine the effectiveness of youth engagement, education, community-based entrepreneurship, and collaboration on rural vitality. Exploring technological, environmental, and policy-related factors could further enhance smart village

initiatives. The conceptual spiral model could be validated through case studies or pilot projects, while increased collaboration among academia,

local governments, businesses, and communities may optimize participatory governance and the implementation of innovative solutions.

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