

## Revitalization of the rural settlement Goranci (Bosnia and Herzegovina) through the “smart village” concept

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### Abstract

The “Smart Village” concept was officially defined in 2017 to alleviate and improve the economic and social situation in rural areas. Like many other rural areas in Bosnia and Herzegovina, the village of Goranci has faced significant economic and social challenges since the mid-20th century. The research objective is to examine the local population’s attitudes toward applying the Smart Village concept in the Goranci area. The research results indicate dissatisfaction among the local community with the level of economic development, especially considering the area’s potential. At the same time, the analysis shows a strong correlation and a positive influence of the local population on the introduction of digital infrastructure and the potential implementation of the Smart Village concept. Furthermore, based on field research and an analysis of positive examples of good practice, the authors propose a potential model for applying the Smart Village concept in Goranci.

### Keywords

Bosnia and Herzegovina, Goranci, smart village, rural area, revitalization

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## Revitalizacija podeželskega naselja Goranci (Bosna in Hercegovina) s konceptom »pametne vasi«

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### Izvleček

Koncept »pametne vasi« je bil uradno opredeljen leta 2017 z namenom ublažitve in izboljšanja gospodarskih in socialnih razmer na podeželju. Tako kot mnoga druga podeželska območja v Bosni in Hercegovini se tudi vas Goranci od sredine 20. stoletja sooča s pomembnimi gospodarskimi in socialnimi izzivi. Cilj raziskave je preučiti odnos lokalnega prebivalstva do uporabe koncepta pametne vasi na območju Goranci. Rezultati raziskave kažejo na nezadovoljstvo lokalne skupnosti s stopnjo gospodarskega razvoja, zlasti glede na potencial območja. Hkrati analiza kaže na visoko stopnjo korelacije in pozitiven vpliv lokalnega prebivalstva na uvedbo digitalne infrastrukture in morebitno izvedbo koncepta pametne vasi. Poleg tega avtorji na podlagi terenskih raziskav in analize pozitivnih primerov dobre prakse predlagajo potencialni model za uporabo koncepta pametne vasi v Gorancih.

### Ključne besede

Bosna and Hercegovina, Goranci, pametna vas, podeželje, revitalizacija

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## 1 Introduction

Many rural areas around the world are facing negative demographic and economic trends. One potential solution for revitalizing rural areas is the concept of smart villages. To stop or at least slow down these trends in the European Union, many declarations and measures have been adopted. Thus, in 2016, a declaration titled A Better Life in Rural Areas (Common Agricultural Policy of the EU) was presented in Cork. The Cork Declaration is based on systematic management of rural areas and the connection and joint action of all stakeholders, with an emphasis on the local community.

Many smart villages emerged over the past decades; however, the concept of the “Smart Village” was first officially formulated through EU measures implemented by the European Commission in 2017. The concept itself is primarily human-centered, focusing on the local community. It involves replacing traditional services with digital ones, primarily to improve the quality of life for residents of rural areas. Rural areas have significant potential, and by applying the smart village concept, they can effectively address issues such as depopulation and economic development (Bošković et al., 2019).

Numerous scientific studies provide a basic historical overview and theoretical understanding of the smart villages concept; however, research with concrete results on its implementation remains limited. Hess et al. (2018) emphasize the importance of networking, i.e., partnerships, in the functioning and organization of smart villages. They also highlight that the concept of smart villages is not universal and that its application primarily depends on the local community. Ristić and Barbarić (2019) analyse and stress the importance of digital innovations in the revitalization of rural areas. They point out the diversity of potential models for implementing the smart village concept, starting from digitalization, social innovation, green economy, etc. Furthermore, they emphasize that initiatives apply the smart village concept encompass the entire rural area, including its natural and social resources, and that the local community is the most important stakeholder in this concept.

Ocsko (2020) describes smart villages as communities in rural areas that build upon existing local strengths and opportunities, developing smart solutions to create and implement strategies aimed at improving economic, social, and environmental conditions, all through the promotion of innovation and mobilization of solutions enabled by digital technologies.

Bielska et al. (2021) argue that agrarian structure should be a fundamental factor in revitalizing rural development and implementing the smart village concept. The authors

identify types of rural areas with potential for applying the smart village concept, including: areas designated for the development of agricultural production and direct sales, areas suitable for the introduction of precise agriculture, areas intended for the development and production of solar energy, areas for the development of organic farming, areas designated for the development of systems that enable water and household heating, underdeveloped rural areas, and areas influenced by large urban centers.

The authors' research has shown that spatial and agrarian structures can significantly influence the potential for developing smart villages.

Gerli et al. (2022) present the development and application of the smart village concept across various scientific disciplines. They emphasize the importance of digital technology for implementing the smart village concept; however, they do not diminish the value and significance of the local community. Benkus (2023) analyses the implementation of the smart village concept within the European Union. In his work, he presents and explains positive examples of individual smart villages as well as the development of the concept within the Republic of Croatia.

## 2 Methodology

Goranci is a rural settlement located north of Mostar, in the hilly and mountainous part of the Herzegovina-Neretva Canton, at an altitude of 700 meters above sea level (Fig. 1). According to the latest Population Census from 2013, it has 175 inhabitants (FZS, 2024, <http://www.statistika.ba/>). In the mid-20th century, Goranci was traditionally oriented toward agriculture, specifically livestock farming, which was the primary occupation of the local population for many years. Combined processes of industrialization, urbanization, depopulation, deagrarianization, and deruralization have negatively affected the demographic and economic landscape of Goranci. Due to the development of industry and service activities, most of the inhabitants of Goranci permanently moved to the nearby urban settlement Mostar, which is a characteristic of contemporary demographic processes in Bosnia and Herzegovina (Nezirović, 2023). Thanks to its natural and cultural resources, and its proximity to the regional center of Mostar, Goranci has a solid foundation for the implementation of the smart village concept.

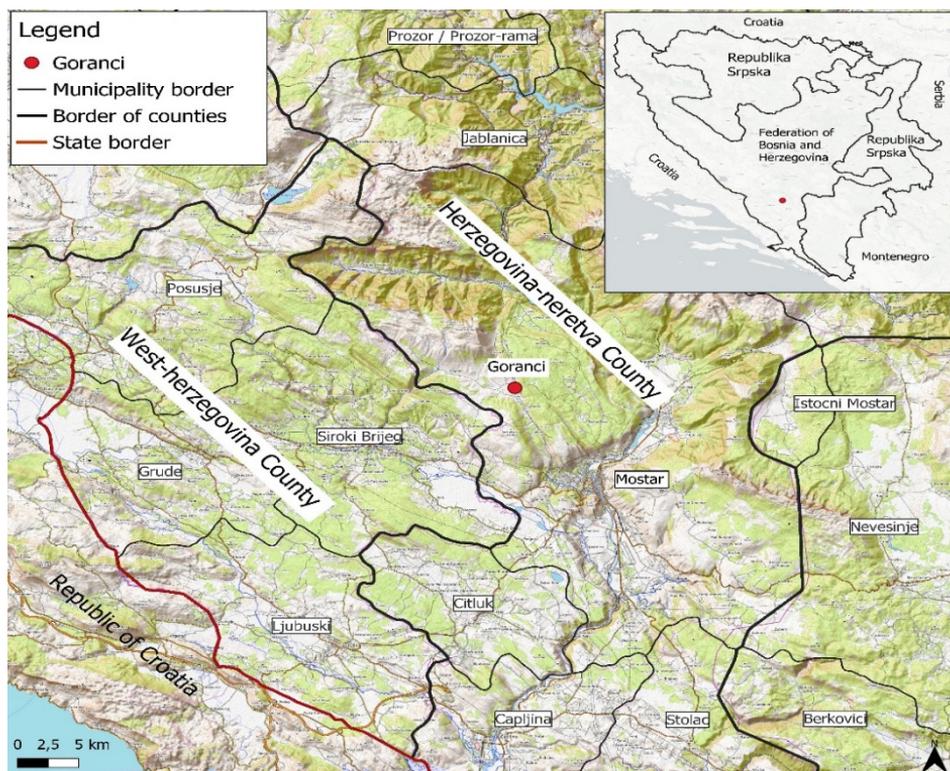


Figure 1: Geographical position of Goranci.

Source: Authors, 2025.

One objective of this paper is to review prior theoretical research and analyze examples of best practices for implementing the smart village concept. The theoretical section reviews scientific papers that define the concept of smart villages and outline the prerequisites for their implementation. In addition to the theoretical research, an empirical study was conducted with the primary aim of analyzing the attitudes of the local community in the rural settlement of Goranci and identifying its potential for applying the smart village concept.

The empirical research was carried out from October to November 2024. The research was conducted through an online survey questionnaire created using Google Forms. Statistical data processing and analysis were performed using IBM SPSS (Statistical Package of Social Sciences), version 25. The study applied descriptive statistics to describe the sample, one-way analysis of variance (ANOVA) to examine differences between groups, and Pearson’s correlation analysis to explore the relationships between variables. A significance level of 0.05 was used as the threshold for statistical relevance.

The research is based on the following hypotheses:

- H1: Goranci has significant natural and cultural potential for implementing the smart village concept.
- H2: The implementation of the smart village concept would contribute to the demographic and economic revitalization of Goranci.

Based on the reviewed literature, and the conducted empirical and field research, the authors proposed a model for implementing the smart village concept in the Goranci area.

### 3 Examples of good practices in the implementation of the smart villages concept

The rural development policy at the European Union level promotes and emphasizes the key components of the smart villages concept through various rural development strategies, policies, investment funds, rural networks, associations, and more. The main initiators of the implementation of the smart villages concept, alongside EU projects and programs, are national and regional institutions operating across various socio-economic sectors (Table 1) (Ristić & Barbarić, 2019).

Table 1: Initiators of smart village development. Examples of good practice from across Europe have shown that there is no single model for creating a smart village.

Source: Authors, 2025. Data: Ristić & Barbarić, 2019.

National and regional institutions/ agencies in different areas	Regional/ local implementation
<ul style="list-style-type: none"> <li>• Agriculture and rural development</li> <li>• EU funds</li> <li>• Economy</li> <li>• Education, science, and innovation</li> <li>• Agencies involved in digitalization</li> <li>• Energy</li> <li>• Transport and communication</li> <li>• Spatial planning</li> </ul>	<ul style="list-style-type: none"> <li>• LEADER, LaGS</li> <li>• Rural associations, non-governmental organizations</li> <li>• Regional boards, advisory councils</li> <li>• Municipalities</li> </ul>

#### 3.1 Mouans Sartoux (France)

Mouans-Sartoux, located in southeast France, is an example of a smart village concept that bases its economic development on organic farming, to protect the environment and create favorable living conditions for the local population. To achieve the goals of a sustainable

economy, it successfully collaborates with various local community stakeholders; for example, school canteens are supplied with organic products produced on local farms (Table 2) (Preparatory Action for Smart Rural Areas in the 21st Century, January 8, 2023, [https://www.smartrural21.eu//wp-content/uploads/Mouans\\_Sartoux\\_\\_Smart-Village-Strategy.pdf](https://www.smartrural21.eu//wp-content/uploads/Mouans_Sartoux__Smart-Village-Strategy.pdf)).

Table 2: SWOT analysis of Mouans Sartouxa.  
Source: Authors, 2025. Data: Preparatory Action, 2023.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Involvement of all stakeholders</li> <li>• Dedicated work and commitment of the smart village leadership</li> <li>• International recognition of leaders in sustainable agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• Imbalance between the demand and supply of local products</li> <li>• Limited citizen participation in decision-making</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Laboratory for local food policy/opportunity for research and networking</li> <li>• Increased interest in sustainable agricultural production</li> </ul>	<ul style="list-style-type: none"> <li>• Urban pressure</li> <li>• Lack of financial resources for the implementation of sustainable agricultural production models</li> </ul>

They also implement significant educational activities for young people and the local community, such as raising awareness of the importance of sustainable food and supporting local ecological farmers. To improve the system and implementation of sustainable agriculture projects, they established the Center for Education on Sustainable Food (Maison d’Éducation à l’Alimentation Durable – MEAD) in 2016. As they aim to increase the number of farmers and make food products more accessible, they focus on introducing digital tools and innovative solutions. In partnership with the local community and universities/research centers, they strive to create and implement innovative policies that will enhance sustainable agricultural production. The development strategy of the smart village concept in Mouans Sartoux brings a range of activities and benefits for applying this model: digital transformation, education and culture, mobility and ecology, and sustainable agriculture (Preparatory Action for Smart Rural Areas in the 21st Century, January 8, 2023, [https://www.smartrural21.eu//wp-content/uploads/Mouans\\_Sartoux\\_\\_Smart-Village-Strategy.pdf](https://www.smartrural21.eu//wp-content/uploads/Mouans_Sartoux__Smart-Village-Strategy.pdf)).

### 3.2 Ostana (Italy)

Ostana is a settlement located in the northwestern Alps in the valley of the Po River. Like most mountain villages, Ostana faces significant depopulation; for example, at the beginning of the 20th century, it had 1,200 residents, but by the end of the same century, had only 6. The revitalization of Ostana began at the end of the 20th century through active efforts of the local community, initially focused on the restoration, protection, and promotion of the alpine cultural landscape. Over the following years, the local community implemented several projects that improved the living conditions of both residents and tourists. Some of these projects include the restoration and tourist valorization of traditional architecture, creation of various cultural routes, protection of Occitan culture and minority languages, the use of renewable energy sources (solar panels, geothermal sources), and the promotion of sustainable agricultural production. At the municipal level, a public company was established to provide various public services, including assisting the elderly (food and medicine delivery), maintaining public spaces, and organizing cultural events. The greatest and most important challenge for Ostana is increasing the permanent population, which would strengthen the local community and, consequently, the economic development of the area. A key factor in Ostana’s development is the very active local community, which is constantly interacting with research centers to develop new smart solutions (Table 3) (Preparatory Action for Smart Rural Areas in the 21 Century, January 7, 2024, [https://www.smartrural21.eu/wp-content/uploads/Ostana\\_Smart-Village-Strategy.pdf](https://www.smartrural21.eu/wp-content/uploads/Ostana_Smart-Village-Strategy.pdf)).

Table 3: Participants in the implementation of the smart village of Ostana.

Source: Authors, 2025. Data: Preparatory Action, 2024.

PARTICIPANTS	ACTIVITIES
<b>Local public authorities</b>	
Ostana municipality	Represents the village and drives local development
Association of Municipalities in Monviso	Public service provider
Regional park Monviso	It stimulates local economic development, nurtures biological diversity, and promotes scientific research.
UNCEM (Unione nazionale comuni comunità enti montani)	National Organization of Mountain Municipalities, Communities and Bodies
<b>Local entrepreneurs</b>	
Mountain cabin-hotel	In addition to accommodation, they also organize cultural events.
Local bakery	Produces and promotes local gastronomic products.

Relaxation farm (Agriturismo A nostro mizoun)	Hospitality services and production of local products such as homemade liqueurs, cashmere products, and more.
La porta del Monviso	Info center and local souvenir shop
B&B (Lou Batent, Amelu)	Hospitality
<b>Local non-governmental organizations</b>	
Association Bouligar	Cultural activities
Association Alpini	Organizes mountain hiking tours
I Reneis	They nurture tradition and old customs
Association of Landowners (Associazione fondiaria Ritorno ai prati)	Collects and manages abandoned land.
Consorzio Archo	Brings together local agri-pastoral entrepreneurs
Municipal Civil Protection	They engage in forecasting, prevention, and management in crisis situations.
<b>Innovators and knowledge centers</b>	
VISO A VISO soc. coop.	A company that provides cultural services, wellness, and eco-tourism.
Institute Monviso	International private research center with a focus on sustainability.
Alpstream	Public center for the research of Alpine rivers (Monviso National Park)
Ambornetti and Iris eco resort	They are developing a project for the revitalization of an abandoned area, transforming it into a self-sufficient eco-resort.
Walden	Innovative startup focused on the sustainable management of natural resources.

### 3.3 Babina Greda (Croatia)

The Municipality of Babina Greda was selected among 734 candidates from the European Union participating in the Smart Rural Communities project, which will demonstrate the smart village concept. Babina Greda is located in Vukovar-Srijem County. It has a favorable geo-traffic position, being connected by the European road network, with direct access to the A3 Zagreb–Lipovac motorway, and the planned construction of the Danube–Sava canal through the municipality. Babina Greda has an active local community that, through numerous associations, maintains the cultural identity and tradition of the Slavonian village. However, like many rural areas of the Republic of Croatia, it faces significant negative

demographic trends. This area urgently needs broadband internet access, greater awareness of the potential benefits of urban-rural partnerships, greater attraction of foreign investment, and more. The goal is to strengthen local community activities so that rural stakeholders become familiar with investment opportunities in agriculture. Digitalization of agricultural production will help retain young people in rural areas, who would certainly contribute to the revitalization of the village and the valorization of other natural and social resources (Preparatory Action for Smart Rural Areas in the 21st Century, October 7, 2024, [https://www.smartrural21.eu/wp-content/uploads/Babina-Greda\\_Smart-Village-Strategy.pdf](https://www.smartrural21.eu/wp-content/uploads/Babina-Greda_Smart-Village-Strategy.pdf)).

Based on the SWOT analysis within the strategy, the village development goals have been set:

- Develop a competitive and sustainable economy, with an emphasis on adding new value to local products (encouraging local agricultural products, networking between buyers and producers, supporting young people in implementing entrepreneurial activities, and utilizing geothermal energy).
- Greater involvement of the local community and improvement of living conditions (renovating and arranging spaces for community gatherings, developing intergenerational networking programs, constructing a multifunctional sports hall, developing an innovative public transport system, and continuing the exploration of geothermal sources).
- Develop smart, environmentally friendly, and economically efficient agriculture (reducing the use of chemicals in farming, encouraging the transition to sustainable agricultural production, improving the link between agricultural producers and the market, and integrating digital tools into agricultural production).
- Promote and brand the services and products of Babina Greda (branding events and local products of Babina Greda, improving the placement of local products, developing tourism products, and new forms of tourism such as cultural, gastronomic, transit, and excursion tourism) (Table 4) (Preparatory Action for Smart Rural Areas in the 21st Century, January 7, 2024, [https://www.smartrural21.eu/wp-content/uploads/Babina-Greda\\_Smart-Village-Strategy.pdf](https://www.smartrural21.eu/wp-content/uploads/Babina-Greda_Smart-Village-Strategy.pdf)).

Table 4: SWOT Analysis of the Smart Village Concept in Babina Greda.

Source: Authors, 2025. Data: Preparatory Action, 2024.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Favorable geostrategic position</li> <li>• Proximity to source and regional markets</li> <li>• Tradition of agricultural and livestock production</li> <li>• Preserved environment</li> <li>• Developed industrial zone “Tečine”</li> <li>• Potential of geothermal resources</li> <li>• A large number of associations that nurture culture and tradition</li> <li>• Rich cultural heritage</li> <li>• Implementation of programs at the EU level</li> <li>• Developed civil society</li> </ul>	<ul style="list-style-type: none"> <li>• Aging population and depopulation</li> <li>• Underdeveloped economy</li> <li>• Insufficient encouragement of entrepreneurship</li> <li>• Predominantly traditional agriculture</li> <li>• Lack of space for young creatives</li> <li>• Insufficient awareness among the population about opportunities for involvement within the local community</li> <li>• Lack of financial support for projects and rural needs</li> <li>• Underdeveloped public transportation</li> <li>• Lack of a unified marketing approach in creating space recognition</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Utilization of geothermal potential and other mineral resources, development of greenhouse production</li> <li>• Construction of ports on the Sava River</li> <li>• Irrigation system for agricultural land</li> <li>• Financing of development programs through national and EU funds</li> <li>• Growing investors’ interest</li> <li>• Creation and promotion of authentic products</li> <li>• Investment in technical and technological modernization of farms and the application of new technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Pessimism and lack of interest in social engagement</li> <li>• Insufficient state support for economic development</li> <li>• Insufficient local, regional, and national funding for development projects</li> <li>• Emigration of educated population and experts</li> <li>• Climate change and natural disasters,</li> <li>• Withdrawal of domestic and foreign investors from investing</li> <li>• Political situation in the region</li> </ul>

<ul style="list-style-type: none"> <li>• Construction and improvement of cultural infrastructure</li> <li>• Networking of entrepreneurs</li> <li>• Promotion of organic farming</li> </ul>	
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#### 4 Results of empirical research

An empirical study was conducted for this paper to examine the attitudes of the local population toward the implementation of the smart village concept. The research was carried out on a sample of 32 respondents, of whom 20 (68.8%) were female and 12 (31.3%) male. Regarding the age structure of the respondents, the largest percentage, (59.4%) belonged to the 20–39 age group, 28.1% to the 39–59 age group, and 12.5% were over 60 years old. In terms of educational background, the largest portion of respondents (43.8%) completed secondary school, 34.4% received a post-secondary diploma, and 21.9% had a university degree. The unusually high proportion of respondents with higher and tertiary education, which is not typical for mountainous rural settlements, is attributable to the fact that over 50% of the study participants were aged between 20 and 39. When asked about their satisfaction with life in Goranci, 56.3% of respondents were neither satisfied nor dissatisfied, 37.5% were mostly satisfied, and 6.2% were completely satisfied with the quality of life in Goranci (Fig. 2).

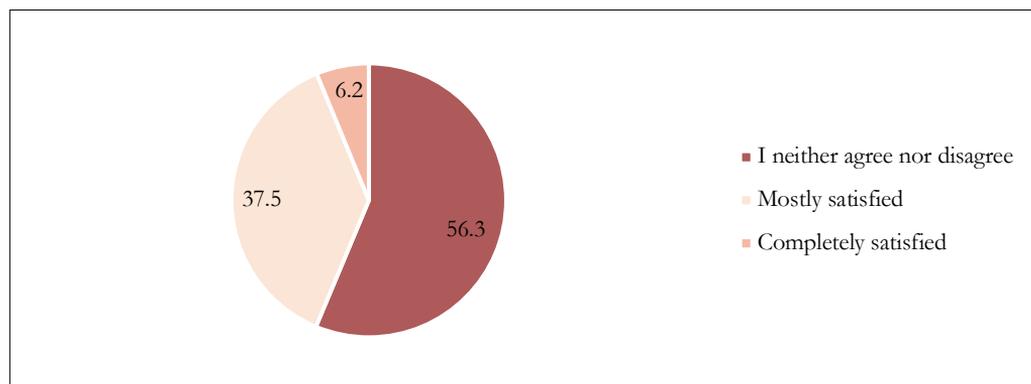


Figure 2: Satisfaction of respondents with the quality of life in Goranci.

Source: Authors, 2025. Data: Authors, 2025.

As the greatest advantages of living in Goranci, the residents cited natural and cultural resources, a peaceful environment, and proximity to Mostar. Given the distance of 15 km from Mostar, which is the tourism center of Herzegovina, Goranci holds significant potential for tourism and economic development (Fig. 3).

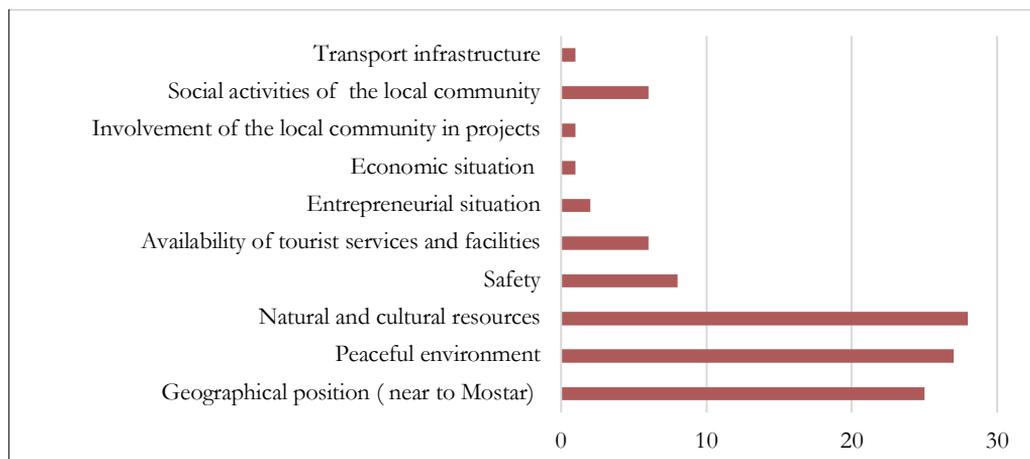


Figure 3: Respondents' attitudes on the advantages of living in Goranci.

Source: Authors, 2025. Data: Authors, 2025.

The local population identified the economic and entrepreneurial situation as the main disadvantage of living in Goranci (Fig. 4). Introducing digital infrastructure would significantly improve both the demographic and economic structures of Goranci. Local residents also emphasize the importance of investing in higher-quality transport infrastructure to ensure easier access to the destination, especially during the winter months.

The study also analyzed the correlation, between introducing digital infrastructure and the revitalization of agricultural production, economic growth, and greater satisfaction with the quality of life of the local population (Table 5). Pearson's correlation analysis was applied to examine the relationship. Based on the correlation coefficient, the relationship is strong. The results showed that the introduction of digital infrastructure has a positive effect on the revitalization of agricultural production, economic growth, and increased satisfaction with the quality of life of the local population. Moreover, the coefficient value indicates a greater willingness among the local population to engage in education and participate in the creation of a smart village in Goranci.

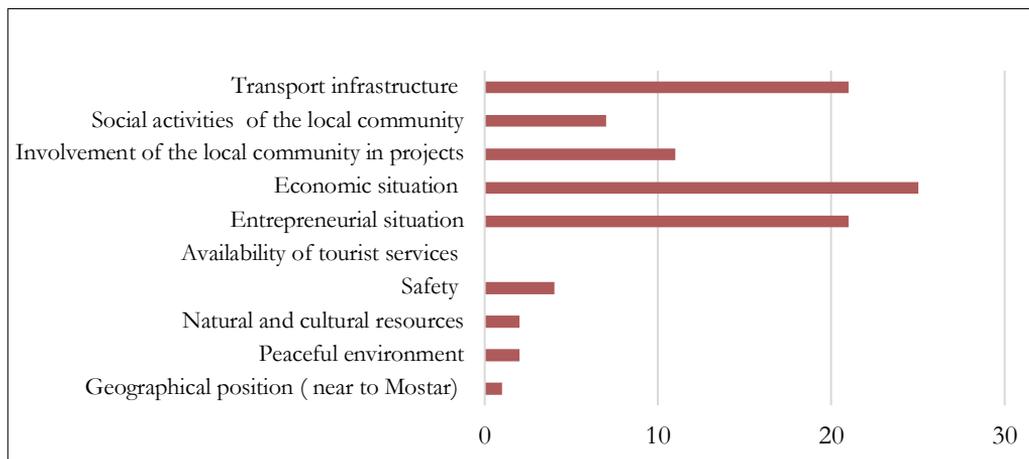


Figure 4: Respondents' attitudes on the advantages of living in Goranci.

Source: Authors, 2025. Data: Authors, 2025.

Table 5: Connection between quality of life and the introduction of digital infrastructure.

Source: Authors, 2025. Data: Authors, 2025.

	Satisfaction with the quality of life
The introduction of digital infrastructure to improve the economic development of Goranci	0.729*
The introduction of digital infrastructure to revitalize agricultural production and livestock farming in Goranci	0.685*
I am ready to educate myself and participate in the process of creating a smart village in Goranci	0.731*

\* Statistical significance value of 0.01.

The research showed that the residents of Goranci believe that, given their (natural and social) they should have greater economic significance, which should not be based solely on excursion tourism, as it has been to date. Although more than 50% of respondents are not very familiar with the “Smart Village” concept, 96.9% support infrastructure investments focused on smart, economically sustainable development, which would open a range of economic opportunities in this rural area (Table 6).

Table 6: Respondents' attitudes on the future development of Goranci.

Source: Authors, 2025. Data: Authors, 2025.

		f	%
Do you believe that Goranci, considering all its natural and social potentials, should have greater economic significance?	Yes	32	100
	No	0	0
	I don't know	0	0
Are you familiar with the “Smart Village” concept?	Yes	14	43.8
	No	8	25.0
	I don't know	10	31.3
Would you support infrastructural investments focused on “smart” and sustainable economic development (e.g., organic agriculture, eco-tourism, green economy)?	Yes	31	96.9
	No	0	0
	I don't know	1	3.1
Do you believe the local community should play a greater role in managing Goranci?	Yes	31	96.9
	No	0	0
	I don't know	1	3.1

The research also examined whether there is a significant difference in satisfaction with quality of life in Goranci, based on agreement that the introduction of digital infrastructure can enhance economic growth and revitalize agricultural production, in relation to the population's familiarity with the “Smart Village” concept. A one-way analysis of variance (ANOVA) was applied to examine the degree of difference.

Based on the results of the ANOVA test presented in Table 7, it can be concluded that a significant difference exists for all statements regarding familiarity with the “Smart Village” concept. According to the post hoc test, satisfaction with the quality of life in Goranci differs across all groups. The least satisfied respondents are those familiar with the “Smart Village” concept, while the most satisfied respondents are those who are unsure if they are familiar with the “Smart Village” concept. The post hoc test also revealed a significant difference in agreement that the introduction of digital infrastructure would improve the economic development of Goranci, with the least agreement from those familiar with the “Smart Village” concept and the highest agreement from those unsure whether they are familiar with it. Furthermore, the post hoc test showed a significant difference in agreement that the introduction of digital infrastructure would revitalize agricultural production and livestock farming in Goranci, with the least agreement from respondents familiar with the “Smart Village” concept and the most agreement from those unsure whether they are familiar with it. Regarding readiness to educate and participate in the process of creating a smart village in Goranci, a significant difference was found between respondents who are familiar with the “Smart Village” concept, those who are not familiar with the concept ( $p < 0.0005$ ), and those who were not familiar with the concept ( $p < 0.0005$ ). It is also

important to note that respondents who were familiar with the “Smart Village” concept showed significantly lower agreement than the other two groups.

Table 7: Differences in respondents’ satisfaction with the quality of life based on familiarity with the “Smart Village” concept.

Source: Authors, 2025. Data: Authors, 2025.

	Yes (N=14)	No (N=8)	I don’t know (N=10)	F	p
	Median value				
Satisfaction with the quality of life	3.00	3.50	4.20	33.8 3	<0.0 005*
The introduction of digital infrastructure to enhance Goranci’s economic development	3.42	4.12	5.00	33.1 5	<0.0 005*
The introduction of digital infrastructure for the revitalization of to revitalize agricultural production and livestock farming in Goranci	3.50	4.12	5.00	22.7 2	<0.0 005*
I am willing to educate myself and participate in the process of creating a smart village in Goranci	3.64	4.62	5.00	24.1 0	<0.0 005*

The final question of the survey focused on what the local population considers key for the development of Goranci within the “Smart Village” concept. Respondents were given the option to select multiple answers. The most selected responses were E-health services for citizens, smart waste disposal containers, smart agriculture, and smart street lighting. The least selected responses were charging stations for electric vehicles and digital educational boards (Fig. 5).

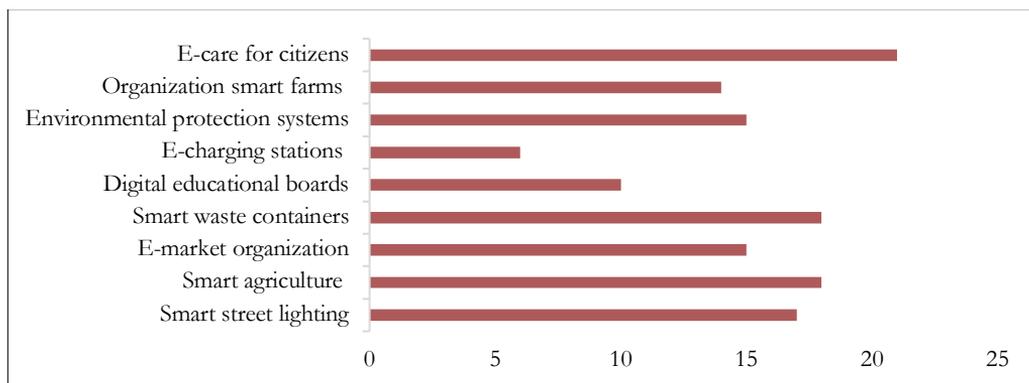


Figure 5: Respondents’ views on what they consider to be the key to the development of Goranci within the “Smart Village” concept.

Source: Authors, 2025. Data: Authors, 2025.

## 5 Goranci: A Model for the Implementation of the Smart Village Concept

The rural area of Goranci has been experiencing negative processes, such as depopulation, deagrarization, and deruralization, since the mid-20th century. These ongoing negative trends in rural areas must be addressed through various measures and activities aimed at improving living conditions and preventing emigration, especially among the younger and working-age population (Putica Džajić, 2024). The inability to provide employment opportunities is one of the primary reasons for the poor demographic picture of rural areas, and therefore, the revitalization of jobs, and consequently, rural communities, is essential (Ristić & Barbarić, 2019). Special emphasis should be placed on the importance of diversifying activities in rural areas, which will no longer rely solely on agricultural production but also take advantage of other opportunities they offer.

Table 8: Key steps for the implementation of the “Smart Village” concept in Goranci.

Source: Authors, 2025. Data: Authors, 2025.

<b>DIGITAL INFRASTRUCTURE</b>	<ul style="list-style-type: none"> <li>• Quality information and communication network</li> <li>• Broadband Internet access, bandwidth speed</li> <li>• Digitalization of business operations (online booking for accommodations, ticket purchases, restaurant reservations)</li> </ul>
<b>CULTURAL HERITAGE</b>	<ul style="list-style-type: none"> <li>• Valorization of cultural material and intangible resources</li> <li>• Digital educational boards</li> <li>• Revitalizing traditional stone houses</li> </ul>

	<ul style="list-style-type: none"> <li>• Mapping and creating interactive maps of “stećak” necropolises in the Goranci area (Orthodox cemetery Pod Jelom, Krivaja, Rajića cemetery, Bili Greb (8) (Skoko, 2014).</li> <li>• Organizing a greater number of social events (folk dance festivals, evenings of “ganga” singing, etc.)</li> <li>• Organizing more educational workshops for tourists (learning “ganga” singing, making traditional costumes)</li> <li>• Organizing educational culinary workshops (making cheese using a sack, preparing “pura” and “lučnica,” “ušticipci,” etc.)</li> <li>• - Organizing traditional games (stone throwing, tug of war, etc.)</li> </ul>
<p><b>SUSTAINABLE AGRICULTURE</b></p>	<ul style="list-style-type: none"> <li>• Drip irrigation system</li> <li>• E-marketplace (online sale and distribution of agricultural products)</li> <li>• Smart systems for monitoring agricultural land (moisture meters, soil pH sensors, etc.)</li> <li>• Use of IoT technologies for monitoring, weather changes</li> <li>• Establishment of eco-farms and development of eco-tourism</li> <li>• “Green” certificates and protection of geographical origin of products (e.g., dairy products such as cheese and cream)</li> </ul>
<p><b>SOCIAL INNOVATIONS</b></p>	<ul style="list-style-type: none"> <li>• E-health</li> <li>• Involvement of the local community in public and private projects</li> <li>• E-care for elderly citizens (digital glucose and blood pressure monitors)</li> <li>• Self-service machines</li> <li>• E-grocery shopping</li> </ul>
<p><b>ENVIRONMENTAL PROTECTION</b></p>	<ul style="list-style-type: none"> <li>• Sorting and disposal system</li> <li>• Smart waste bins</li> <li>• Energy renovation of households</li> <li>• Smart LED lighting</li> <li>• Use of renewable energy sources (solar, wind)</li> <li>• Circular economy (waste from one process used as a resource in another)</li> </ul>

Based on the analysis of existing smart village concepts and empirical and field research, the authors propose a model for implementing a smart village in Goranci. Taking into account all its key potentials—natural and social resources, favorable geographical position (proximity

to the city of Mostar), an area with traditional agricultural production, and a destination for excursion tourism—this rural area, with the support of local authorities and the community, could become a “smart village” and thus achieve the status of one of the first smart villages in Bosnia and Herzegovina (Table 8).

## 6 Conclusion

The concept of smart villages is relatively officially introduced in 2017 by the European Parliament. It involves replacing traditional services with digital ones, primarily to improve the quality of life in rural areas. Rural regions have great potential, and through the smart village concept, they can successfully address negative socio-economic trends. Empirical research conducted among residents of Goranci highlights their dissatisfaction with the quality of life, particularly given the area's rich natural and social resources. Residents identify the geographical location and natural and social resources as the biggest advantages. Most respondents view the introduction of digital tools into everyday life, both for locals and tourists visiting Goranci, as a positive development. They consider e-care services for citizens, smart waste bins, smart agriculture, and smart public lighting to be the key elements for developing Goranci as a smart village. Given that Goranci is traditionally an agricultural area known for livestock farming and dairy products, the greatest emphasis should be placed on organic agricultural production. For the local population, this may serve, if not as the primary source of income, then certainly as a supplementary one. With its natural and social resources, Goranci has significant potential to implement the smart village model. By introducing smart solutions such as digitalization, infrastructure modernization, renewable energy sources, and sustainable agriculture, Goranci has the opportunity to become a model of a sustainable, competitive rural area. A smart village in Goranci could become a hub of rural development, fostering ecological agriculture and diverse tourism offerings, thereby ensuring both demographic and economic growth in the area. However, for the revitalization of Goranci, it is crucial to consider introducing digital solutions, regardless of whether it becomes a smart village in the near future.

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## Povzetek

Podeželska območja po vsem svetu se že dolgo soočajo z negativnimi socialnimi in gospodarskimi izzivi. Ena od možnih rešitev za te negativne trende je koncept pametnih vasi, ki ga je leta 2016 uvedla Corkška deklaracija. Predmet te znanstvene raziskave je koncept pametnih vasi in njegova uporaba na podeželskih območjih po vsej Evropi. Študija vključuje analizo izvedenih projektov pametnih vasi, empirično raziskavo, opravljeno med prebivalci in potencialni koncept, ki bi ga z izboljšanjem obstoječih virov lahko uporabili na podeželskem območju Goranci.

Rezultati empirične raziskave so pokazali nezadovoljstvo lokalne skupnosti s trenutno kakovostjo življenja in zanimanje za nujno uvedbo predvsem demografskih in gospodarskih ukrepov. Večina prebivalcev pozdravlja uvedbo digitalnih orodij, tako za vsakdanje življenje lokalnega prebivalstva kot turistov, ki obiščejo Gorance. Ključ do demografskega in gospodarskega razvoja Gorancih je izboljšanje prometne infrastrukture in uvedba e-oskrbe za državljane, pametnih zabojujnikov za odpadke, pametnega kmetijstva in pametne javne razsvetljave. Ker gre za tradicionalno kmetijsko območje, znano po živinoreji in mlečnih izdelkih, bi moral biti največji poudarek na ekološki kmetijski pridelavi in različnih oblikah podeželskega turizma.