



## **Smart Initiatives in a Suburban Community: An Example From the Holy Cross Mountains in Poland**

Author: Komorowski, Łukasz

Source: Mountain Research and Development, 42(1)

Published By: International Mountain Society

URL: <https://doi.org/10.1659/MRD-JOURNAL-D-21-00037.1>

---

BioOne Complete ([complete.BioOne.org](https://complete.BioOne.org)) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](https://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

# Smart Initiatives in a Suburban Community: An Example From the Holy Cross Mountains in Poland

**Lukasz Komorowski**

lkomorowski@irwirpan.waw.pl

Institute of Rural and Agricultural Development, Polish Academy of Sciences, Department of Rural Economics, Nowy Świat Street 72, 00-330 Warsaw, Poland

© 2022 Komorowski. This open access article is licensed under a Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>). Please credit the authors and the full source.



This article considers the smart village concept as a new instrument for creating European Union (EU) policies on a territorial microscale. The goal was to identify the key resources that determine successful implementation of smart strategies at the lowest territorial level, using the example of a suburban area in the Holy Cross Mountains (Świętokrzyskie Mountains) in Poland. The study examined how the local community implements the smart village concept and the extent to which this concept is useful in mountain and foothill areas, where problems caused by natural conditions particularly affect local communities. The intervention took place in Świętokrzyskie province, in the suburban village of Piaseczna Górka. It was assessed through a case study during which 15 individual in-depth interviews were conducted, focusing on several smart initiatives conducted in 2015–2020. The respondents represented 3 groups of stakeholders: initiators, beneficiaries, and local government.

The study enabled the key resources of smart villages—human, financial, material, and information—to be identified. Human resources were the most important for the success of the initiatives under consideration, being the driving force for the other 3 resources. Uncovering the mechanisms involved in implementing smart initiatives on a microscale is becoming especially important as a tool in solving local problems, which in mountain areas are often determined by specific natural conditions. The smart village concept is set to be a major instrument of the EU's future financial framework for 2021–2027 and is reflected in a growing number of EU and national documents, including those concerning mountain and foothill areas with varied geographic locations and diverse socioeconomic characteristics.

**Keywords:** smart villages; local resources; microscale initiatives; innovation; suburbanization; European Union policy; Holy Cross Mountains; Poland.

**Received:** 4 August 2021

**Accepted:** 27 January 2022

## Introduction

In recent years, increasing attention has been given to ways of maintaining rural viability, reviving public services, and stimulating grassroots activity among rural populations. In this discussion, one question that is growing in importance is how the viability of rural areas might be aided by information and communications technology (ICT), starting with overcoming the digital gap and improving digital competence (EU 2016) and extending to the implementation of advanced digital solutions in the economy (OECD 2020). In the past few years, great hope in this respect has been pinned on the concept of smart villages (ENRD 2017). This concept assumes that in their drive to improve their wellbeing, rural communities should take advantage of digital technologies and innovations, which will enable them to make better use of local resources and improve the standard of public services.

Research on smart villages has been conducted at different territorial levels, covering continents (Van Gevelt et al 2018; Doloï et al 2019; Lakshmanan et al 2022), countries (Fennell et al 2018; Slee 2019; Komorowski and Stanny 2020), and smaller administrative units (Vaishar and Štastná 2019; Adamowicz and Zwolińska-Ligaj 2020;

Kalinowski et al 2021). The topics considered in these studies are varied: projects from Asia, Africa, and America most often focus on energy systems, climate, and sustainable agriculture (Adesipo et al 2020; Majumdar 2020), whereas European research mainly focuses on the context of revitalizing local communities by improving public services, using new technologies, activating social capital, and enhancing knowledge exchange (ENRD 2018; Visvizi et al 2019).

The smart village concept is increasingly reflected in planned policies for rural development in the European Union (EU). The definition of a smart village adopted by the European Commission underlines 4 elements that are key for initiating smart actions in local communities (ENRD 2017):

- Using digital technologies and innovations;
- Striving to improve quality of life;
- Rethinking the improvement of public service standards;
- Ensuring better use of local resources.

What is new in this approach to smart development is not the individual elements considered separately but rather their appropriate configuration matching a given locality's

circumstances, the structure of their economies, and their diversity (Torre et al 2020).

Studies show the potential applicability of the smart village concept in different social and economic contexts—for example, in counteracting the negative effects of rural decline (Komorowski and Stanny 2020; Paniagua 2020), as a factor in sustainable rural development (Guzal-Dec 2018; Pérez-del Hoyo and Mora 2019), or as an instrument for mobilizing local communities (Nieto and Brosei 2019). The shared aspect of these different contexts is emphasized by Holmes et al (2015: 359): “Smart villages are not the only approach for the sustainable development of rural populations, but they are certainly a strategy that can improve the quality of life and give younger generations positive reasons to stay rather than migrate.”

One of the smart village concept’s assumptions is territorial sensitivity, matching the selection of instruments of action to the needs and specific character of the place undergoing intervention. Numerous studies on the functional diversity of rural areas show that there are many types of rural area in the world (Weingarten et al 2010; OECD 2011; Rosner and Stanny 2017; Hopkins and Copus 2018; USDA 2019). Each type has its own social, economic, and environmental features that determine its development. Approximately 80% of the global rural population lives near cities (OECD 2016), forming a unique community of suburban villages (settlements). These types of areas are subject to powerful suburbanization pressure (Czarnecki 2019), often turning into bedroom communities (which means that the residents spend most of their day in the city) (Salamon 2009; Jolley et al 2011), where many developmental problems have been identified (Lisowski and Grochowski 2008):

- Economic—for example, increased costs of infrastructure and public services and reliance on individual transport;
- Social—for example, decline of social ties and conflicts between newcomers and indigenous populations;
- Environmental—for example, excessive reduction of green areas, increased consumption of energy and water, and landscape degradation.

The increasing urbanization pressure also affects mountain and foothill regions. These impacts are observed in various spheres, most commonly in the context of uncontrolled population influx (Goodall 2004; Grau and Aide 2007), spatial and landscape transformation (Hrehorowicz-Gaber and Gaber 2009; Huang 2017), environmental pressures (Romero and Ordenes 2004; Ienciu et al 2013), and ecosystem services (including cultural ones) (Schmidt et al 2016). Great hopes for resolving all kinds of problems of rural communities are seen in actions that follow the smart village concept. This is reflected in the regulations, strategies, and plans being drawn up for the EU’s financial framework for 2021–2027 (eg EC 2018; EPRS 2021). Some documents specifically cover mountain and foothill areas (eg Euromontana 2020; EUSALP 2021). Euromontana’s *Towards a Long-Term Vision for Mountains’ Rural Areas* notes the diversity of rural areas inside the functional urban area (FUA), outside but still close to the FUA, or far and remote from the FUA. The document thus points to the necessity of taking action “through integrated strategies implemented at territorial level” (Euromontana 2020: 6). These strategies

TABLE 1 Intervention information.

Parameter	Study site details
Location	26-026 Piaseczna Górka, Morawica municipality, Kielce county, Świętokrzyskie province, Poland
Geographical coordinates	50°46′04″N, 20°37′15″E
Duration	2015–2020
Approximate budget	US\$ 20,000
Initiators	Village mayor, village council, Piaseczna Górka community association
Beneficiaries	Inhabitants of Piaseczna Górka and Morawica municipality, guests, tourists

Source: Own study.

should incorporate the use of ICT and social innovation through a multifund and multi-institutional approach. Such solutions were tested, among others, within the framework of the Interreg Alpine Space project Smart Villages. The results of this indicate that smart transformation of mountain areas can realize the natural advantages of these areas and revitalize them. This can be done by integrating the smart village approach into policies at different territorial levels, in combination with the allocation of adequate funds for innovation and pilots (Interreg Alpine Space 2020).

This leads to the question: How do local rural communities create their own development through microscale initiatives? This article aims to identify the key resources needed for successful smart strategy implementation at the lowest territorial level, taking the case of a suburban locality in Poland’s Holy Cross Mountains as an example. The study examined how this local community implements the smart village concept and the extent to which this concept is useful in mountain and foothill regions, where local communities are struggling with processes similar to those of other rural areas and experience problems connected with natural conditions.

## Intervention description

The intervention under analysis took place in the village of Piaseczna Górka located in Morawica municipality, Świętokrzyskie province, southeastern Poland (Table 1; Figure 1). The village lies next to the province capital, Kielce (approx. 13 km from the downtown area), and 190 km from Poland’s capital, Warsaw. In geological terms, the village is located in the Kielce Unit of the Holy Cross Mountains (Konon 2007), which are low mountains located outside the Carpathian range. They are recognized as the oldest mountains in Poland and among the oldest in Europe. They form a physicogeographical mesoregion with an area of 1825 km<sup>2</sup> composed of several mountain ranges with vast tectonic depressions between them. Absolute elevations range from 175 to 612 masl, with slopes of up to 200 m (Ciupa et al 2016). Piaseczna Górka ranges between 236 and 257 masl (Figure 1). As of the end of 2018, the village had a population of 588, more than 4 times the figure for 1996 (BIP 2019). This

**FIGURE 1** (A) Map of Poland showing the location of the case study; (B) case study site of Piaseczna Górka; (C) elevation profile of Piaseczna Górka.



population growth is the result of the developing residential function of the Morawica municipality, especially its northern part bordering Kielce, which is where Piaseczna Górka is located. According to rural development monitoring typology (Stanny et al 2021), the Morawica municipality belongs to type 6: suburban with reduced agricultural function.

Piaseczna Górka won the My Smart Village competition organized by the Institute of Rural and Agricultural Development of the Polish Academy of Sciences as part of a project conducted in 2019. The project was cofinanced with EU funding under the Polish Rural Network (KSOW) call. Its aim was to find implemented social and digital innovations, disseminate and promote the concept of smart villages, and create an electronic knowledge bank on smart initiatives (Komorowski 2020). It was Poland's first competition with such a theme (the second was judged in June 2021) and one of the first in Europe; a similar project had previously been completed in Finland (Maaseutu 2020).

This article focuses on grassroots initiatives that Piaseczna Górka's residents submitted to the competition. The initiatives were implemented in several stages, following a small-steps method, as part of an informal strategy for the locality's development adopted at the time. The completed projects are compatible with the smart village concept and are considered within 4 overlapping categories: (1) innovation, (2) quality of life, (3) public service, and (4) local resources (Table 2). Category 4—local resources—was the basis of all smart projects and is thus treated as a horizontal category.

## Methods

Triangulation of research methods was used to evaluate the effects of these smart initiatives. This involved “using more than one particular approach when doing research in order to get richer, fuller data and/or to help confirm the results of the research” (Wilson 2014: 74).

TABLE 2 Smart initiatives implemented in Piaseczna Górka.

Problem diagnosed	Solution implemented	Leading category	Years of implementation	Cost (US\$) <sup>a)</sup>	Main initiator	Main source of funding
Some residents being ill informed about activities, including proenvironmental ones	Setting up a village website and a residents' fan page on Facebook	Innovation	2015	No cost	Village mayor	Not applicable
Reduced rainwater retention; local flooding	Setting up a rain garden on a public lot, water retention workshops	Quality of life	2017	3700	Piaseczna Górka community association	National Fund for Environmental Protection and Water Management
Lack of a cultural center and library; residents' unsatisfactory access to culture, including that available outdoors	Opening an outdoor library in a replica phone booth (bookcrossing)	Public service	2018	4200	Piaseczna Górka community association; informal group of regionalists	Donation from a company
Lack of illumination of sports fields, the public gazebo, and the outdoor library; reduced safety after dark	Installing 7 surface-mounted device-type autonomous solar lamps with diodes and dusk sensors	Innovation	2017–2018	1200	Piaseczna Górka community association	Other grants
Underutilized rich history of the village and its surroundings; a need to develop an educational and recreational offering taking advantage of local natural assets	Designing a questing path related to the locality's history, also available online	Public service	2018–2019	7000	Piaseczna Górka community association	European Agricultural Fund for Rural Development
Insect infestation, requiring resolution using natural methods	Constructing birdhouses and insect hotels and placing them in public spaces and on residents' properties	Quality of life	2020	2600	Piaseczna Górka community association	Enterprise foundation grants

Source: Own work based on Jamorska-Kurek 2020 and individual in-depth interviews.

<sup>a)</sup> Currency converted to US\$ at the average exchange rate during the years of implementation. The gross minimum monthly wage in Poland was US\$ 470 in 2015 and US\$ 720 in 2020.

The first stage involved desk research aimed at learning about the particulars of the village in question, its surroundings, and any socioeconomic changes that were occurring. The analysis considered scientific studies, reports, development analyses and strategies, statistical datasets (eg on population changes), and local websites (official, informational, and social).

The main research method was an in-depth case study (Noor 2008) in Piaseczna Górka, during which 15 extensive individual in-depth interviews (IDIs) were conducted with respondents selected by snowball sampling (Goodman 1961). The interviews followed 3 scenarios, one for each of the groups selected (in the description of the results, the IDI respondents have been anonymized and marked with consecutive numbers):

- 5 interviews with people who initiated the projects in question (initiators);
- 6 interviews with people who benefited from the solutions considered in the study (beneficiaries);
- 4 interviews with people working in the local government (local government).

Furthermore, nonparticipant observation was carried out during the field visit not involving any specific role of the

researcher. This type of observation provides a better understanding of the processes and mechanisms functioning within a given population (Ciesielska et al 2018).

## Results

### Understanding of the smart village concept

The respondents' understanding of the concept of smart villages revealed an emphasis on issues such as respect for the environment, counteracting climate change, and maintaining a balance of economic, social, and environmental considerations. As one local government member underlined, a smart action is “a local, civic initiative bringing together creative people who want to achieve certain goals depending on where they live—these small places focus on micro needs” (Local Government 2). The answers of other respondents show that satisfying these needs should take into account all groups of residents (by age, occupation, tastes, etc), as well as considering the benefits for future residents. These opinions are largely compatible with the definition of sustainable development, or development “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs” (UN 1987: 54).

### The reasoning behind the initiatives

The village residents are aware of environmental problems around them. This is often because their lives are directly affected (eg by regular flooding), whereas at other times, it is a reflection of their concern for the environment, ecological awareness, or a vision of development leading to a specific objective.

A pragmatic approach is noticeable in the case of individual projects aimed at solving a specific problem. This was the case with the rain garden, which was laid out on a public lot regularly flooded by meltwater and rainwater. The problem had existed for years but went unnoticed by local leaders, as well as residents, who saw no need for a solution. It was only when the area around the lot was developed into sports fields and a gazebo was built that the community regarded the problem as a real issue. However, identifying the source of the problem (answering the question “Why does the area get flooded?”) was also important, together with the availability of external funding for this kind of project. An accurate diagnosis of the problem enabled the best solution to be chosen, which in this case consisted in building a rain garden.

A similar pattern was observed in the case of the installation of solar-panel lighting in the village recreational center. The need for this did not emerge until the recreational and sports infrastructure was in place, together with other facilities that the residents used intensively. The need to ensure safety and to enable people to use the common space for as long as possible were contributing factors in the purchase of the lamps. Local leaders’ high ecological awareness and economic considerations (reducing maintenance costs) led to power from renewable energy sources being perceived as the most justified.

One major factor for this kind of initiative to emerge is the unique features of a given locality. A suburban location involves the inflow of urban residents, who bring certain urban behavior patterns with them and thus demand more from the space where they live. This aspect appeared in one of the responses: “newcomers have greater requirements and more ideas than the native residents” (Local Government 2). Their age (the generation of 30- to 40-year-olds), high levels of education, great creativity, and desire to design their perfect place to live are all important here. Another respondent noted that “these days, hard-working people who come home want to feel some kind of fulfillment. Finding your special place on earth gives you an inner belief that you are in the right, good place, at a good time—it’s a matter of psychosocial comfort” (Beneficiary 1).

### Initiative implementation

The respondents all underlined that the key to undertaking a given initiative is social approval. This involves, first, providing information via various channels (social media, noticeboards, and text messaging) and, second, involving the residents at different stages of implementation. Most projects require the consent of the local government as the owner of a given lot or building; in many cases, the lack of such consent means giving up the planned operation. However, such situations were rare in the locality considered in the study.

Seeking funding for an initiative is an important stage and applies to any kind of project, regardless of its theme. At

the same time, a desirable model is one in which an idea stimulates the search for funding, not one in which the availability of funding for a specific purpose makes the initiators apply for a subsidy, most often without consideration for the most urgent local needs. It is an important observation that initiators do not expect large sums to finance their projects; the most appreciated grants are those that are relatively small, involving easy accounting: “The money we apply for is not much, some several to a dozen thousand [Polish zlotys; ie no more than US\$ 5000]. I know I can safely plan such sums and settle accounts for them within a given time” (Initiator 1).

Any essential construction work is a major stage of project implementation. The case of the rain garden enables us to trace how important it is to gain not just public approval but also participation and shared responsibility for this stage to succeed. A dozen or so residents were involved in the work, and the project’s initiators organized a meeting for all of the municipality’s residents and the local authorities that showed how rain gardens work and their benefits. “The idea was to show that rain gardens are one possible solution, to change people’s way of thinking, show that it’s not just about having a lawn surrounded by thuja hedges, but that we can set up gardens that increase water retention” (Initiator 1).

From the point of view of the beneficiaries of the initiatives analyzed here, there were 3 key factors to getting people involved:

- Encouragement from the initiators and requests to help a little in accordance with a person’s skills or occupation (eg a carpenter being asked to make a wooden element);
- A sense that the planned project meets some kind of private need of their own (eg a new place for children to play);
- Noticeable social benefits from previous projects, in which they may not necessarily have been involved.

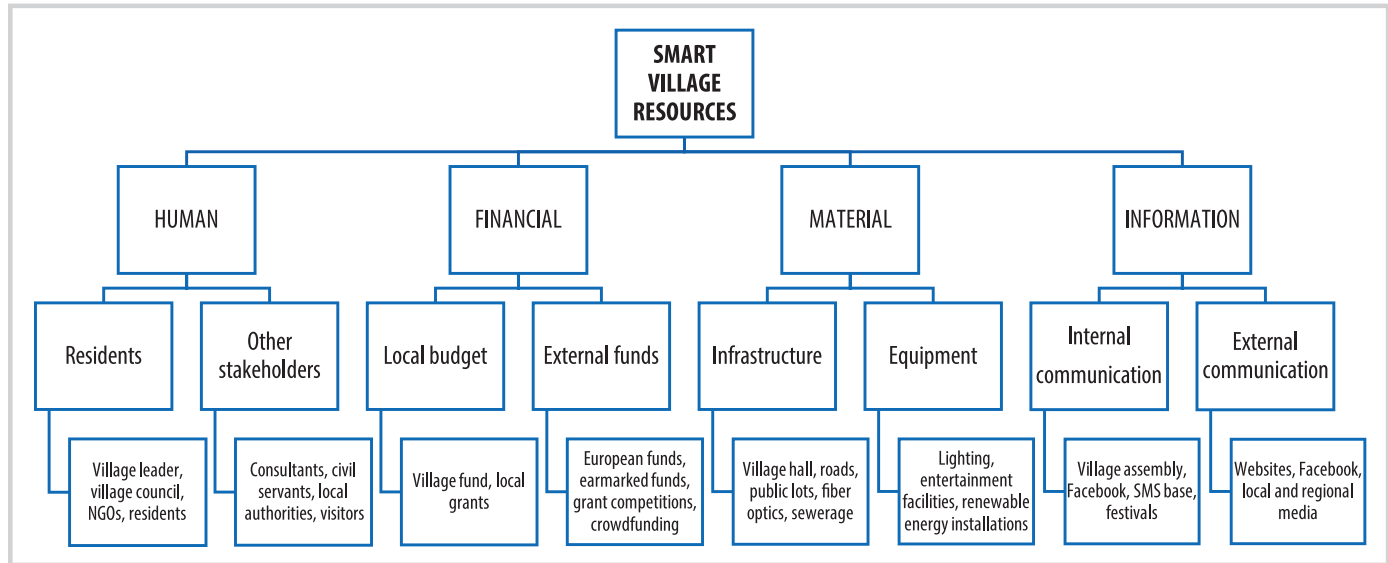
Nikkhah and Redzuan (2009: 171) called this phenomenon a “bottom-up approach of community development,” in which the community plays the role of initiator and motivator for other local actors.

### Effects of the initiatives’ implementation and their permanence

The impact of the projects under analysis can be interpreted in 2 ways: quantitatively (ie what concrete, measurable effects appeared after the project was completed) and qualitatively (ie through subjective changes in the quality of life, residents’ behaviors, and building a sense of community). These are often long-term effects—the longest lasting but only noticed after a significant delay.

The quantitative effect mentioned most often was the participation of a certain number of the village residents in a project’s implementation (at different stages). This was connected with meeting new people, forming new neighborly relations, and having cross-generational entertainment. Other immediate effects were linked to the goal of a given project. Respondents mentioned things like the immediate improvement of safety and the longer accessibility of recreational areas during the day because of the installment of smart lighting. It takes a little longer to see the effects of building birdhouses, because specific bird species need to move in first.

FIGURE 2 Resources of smart villages.



The construction of the rain garden means that the public space in the village center no longer gets flooded, and water is stored naturally. The data show that Poland's water resources are among the lowest in Europe, which is already becoming a barrier to socioeconomic development (Kundzewicz et al 2020). The improvement of small water retention is one of the main challenges that will need to be addressed in the coming years at many territorial levels (including the microscale) and using different kinds of resources. This problem also concerns mountain and foothill regions, which are at a relatively high risk of flooding (ISOK 2021).

The long-term effects mentioned most often included greater integration of the residents, a changed attitude toward common spaces, increased environmental knowledge and awareness, and transfer of solutions to the residents' own properties (eg building rain gardens in backyards). The changes taking place in the communities under consideration were characterized by one respondent as "a learning process" (Initiator 4). In this case, we might speak not only of the local community learning to work together and acquiring new skills and knowledge but also of learning on the part of the rural organizations responsible for the formal implementation of projects (writing applications, project accounting, etc).

A complete evaluation of how durable the social effects might be is not possible yet because of the relatively short time that has passed since the projects were completed. Nevertheless, respondents saw the greatest danger to this criterion in the costs of maintaining the infrastructure: "Generally speaking, the downside of anything built as part of civic initiatives is that it needs maintenance. Repair costs are twice as high as the entire village budget" (Beneficiary 2).

### Key resources

Every organization formed by people has specific resources. Based on the proposal of Griffin (2004), we can distinguish 4 types of resources: human, financial, material, and information. In the case of smart villages, each of these resources has specific features:

- Human—the skills, knowledge, abilities, competences, and predispositions of all village residents and people potentially involved in the implementation of the smart village concept;
- Financial—the funds that the local community uses to finance various projects; they include the local budget, grants, subsidies, and other external funding obtained by the community;
- Material—physical assets that include buildings and other premises, as well as equipment that can be used for the rural area's benefit;
- Information—useful data needed for effective decision-making, for example, a resident group on social media, an external adviser, and all possible information channels.

The key resources in each category were identified in Piaseczna Górka and divided into subcategories (Figure 2).

The study suggests that various actions are needed to activate each type of resource. The hardest category to activate, and the one that is the foundation of all actions being undertaken, is human resources. However, with each new initiative involving residents and other stakeholders, this resource became increasingly consolidated and resilient. This made it easier to manage the other resources: financial (acquiring specialist know-how, better research, and experience), physical (purchase of equipment, better infrastructure management, and a better technical base for future initiatives), and information (a growing audience group, acceptance of new forms of communication, and greater recognizability in the region).

### Discussion and way forward

Although the smart village concept was initially targeted at areas of rural decline, it is evolving toward a universal concept aimed at solving various problems on a local microscale. The broad definition of smart villages, which underlines 4 aspects—local community, services, quality of life, and new technologies—helps reframe the actions needed to revitalize rural areas. At the same time, the characteristics of such revitalization will be different for

different types of areas. Another key element is the smart aspect or, to invoke the smart city concept, the use of new technologies, including green technologies, in different spheres: economic, social, environmental, and those related to mobility, living conditions, and management (SRF 2007). Insofar as ICT implementation is the main objective in the smart city approach (Dameri 2016), in the smart village concept, the focus is more on improving residents' quality of life in accordance with their needs (Wolski 2019). Here, ICT plays an important, albeit optional, role. The example of Piaseczna Górka shows that the initiatives studied were compatible with the elements listed in the definition of smart villages (ENRD 2017): digital technologies and innovations, quality of life, public service, and local resources. It was the play of these 4 spheres that ensured success in the implementation of the projects under investigation. At the same time, in this particular village, digital technologies turned out to be less important than social and environmental innovations. Thus, the word "smart" can be understood primarily through the prism of people's actions taken, rather than as technological transformation in the countryside.

Implementing smart initiatives is impossible without elements like basic infrastructure (eg roads, sewage system, and Internet), public services (eg transport, water supply, and waste collection), a network of horizontally linked institutions (eg nongovernmental organizations and local businesses) and vertically linked ones (eg government, local authorities, and village council), and various local resources. These elements have been mentioned in other research (eg Ranade et al 2015; Komorowski and Stanny 2020; Torre et al 2020). This study showed that the constellation of these elements depends on the character of the initiatives. Technological projects require greater support from higher-level authorities and companies, as well as substantial financial outlays, whereas social initiatives are based more on local human resources and less on external support.

This community was identified as having low social involvement, a great need for investment in municipal infrastructure, and environmental problems caused by unfavorable natural conditions (hilly terrain and insufficient coverage with low vegetation) on the one hand and intensified anthropopressure on the other. The decisive factor in the residents' growing involvement and the gradual solving of identified problems with the help of smart solutions was that the locality is a suburban one. Research shows that the newcomer population (gentrifiers) becomes the initiators of many local projects, because they move out of urban areas with an idealized vision of rural life and high human capital (Nelson et al 2010; Zweglińska-Gałecka 2019). It was evident from the interviews that the problems attributable to the location of the village had existed for a long time, but the influx of people from nearby Kielce caused them to start bothering the inhabitants, especially the new ones. It turns out that migration processes determine the grassroots activities in the village under study to a greater extent than its location in a foothill area. The question is to what extent the smart village approach should be considered in terms of location (in the mountains, by the sea, far from the city, etc) and to what extent it should be approached in terms of problems (eg urbanization, depopulation, decline in social activity, and climate change).

It seems that the key here may be to change the approach to rural development from spaces to places. To date, EU policies have not provided for interventions undertaken at the lowest territorial level: the locality. Instruments for supporting rural development have usually been managed from the municipality level at best. This creates opportunities for a new dimension of place-based policy, that is, "a long-term strategy aimed at tackling persistent under-utilization of potential and reducing persistent social exclusion in specific places through external interventions and multi-level governance; promoting the supply of integrated goods and services tailored to contexts; and triggering institutional changes" (Bachtler 2010: 1–2). That new dimension might be the place-sensitive development policy proposed by Rodríguez-Pose (2017), which should focus on taking advantage of local potentials and opportunities yet "stay clear of the welfare, income support and big investment projects" (Rodríguez-Pose 2017: 189). The results of the present study show, first, that local communities taking this approach can rely on the successful implementation of smart initiatives and, second, that projects pursued at the level of single localities and managed by the local community and its leaders are a collection of distinct case studies. Every such case might require an individual approach at many stages: in development planning (creating the concept), implementation (carrying out the initiatives), and assessing the effects (evaluation).

The smart village concept is appearing in a growing number of EU and national documents, which suggests that it will be a major instrument in the EU's future financial framework for 2021–2027. However, 2 paths to smart initiative implementation are starting to emerge in Europe. One path has been outlined in the case study of Piaseczna Górka and might be called unofficial, serving as the basis for developing the guidelines for the official path, whose main ideas will be reflected (to a lesser or greater degree) in the Common Agricultural Policy strategic plans of the EU member states (EC 2021). The beneficiaries of smart solutions will include various places, among them mountain, suburban foothill, and remote localities.

As a key message for practice and for decision-makers in the context of the smart village concept's further development, one might offer a few universal final remarks, which can be useful both in mountain and foothill areas and beyond:

- There is no single way of being smart—the catalog of needs is varied and open.
- Villages that fulfill the smart village concept already exist but often do not identify themselves as being smart.
- Smart does not exclusively mean highly advanced technology. ICT is important but as a tool, not a goal.
- Microscale initiatives can be financed from different sources—European, national, government agency, municipality, village, and private budgets.
- The initiator is usually a local leader (village mayor, councilor, etc) who should receive support in their activity.
- The next stage in the development of the smart village concept is its implementation in EU policy through a flexible and well-thought-out system of financing and incentives.



## ACKNOWLEDGMENTS

The results presented in this article are part of the project “In-depth study of smart villages in Poland—case studies,” carried out at the Institute of Rural and Agricultural Development of the Polish Academy of Sciences in 2020–2021 under contract KSOW / 4/2020/052, concluded with the Agricultural Advisory Centre in Brwinów within the framework of KSOW call 4/2020.

## REFERENCES

- Adamowicz M, Zwolińska-Ligaj M.** 2020. The “smart village” as a way to achieve sustainable development in rural areas of Poland. *Sustainability* 12(16):6503. <https://doi.org/10.3390/su12166503>.
- Adesipo A, Fadeyi O, Kuca K, Krejcar O, Maresova P, Selamat A, Adenola M.** 2020. Smart and climate-smart agricultural trends as core aspects of smart village functions. *Sensors* 20(21):5977. <https://doi.org/10.3390/s20215977>.
- Bachtler J.** 2010. Place-based policy and regional development in Europe. *Horizons* 10(44):54–58. The quotation was taken from the accepted author manuscript available at: <https://pureportal.strath.ac.uk/en/publications/place-based-policy-and-regional-development-in-europe>; accessed on 10 June 2021.
- BIP [Bulletin of Public Information of the Morawica Municipality].** 2019. *Localities. Piaseczna Górką* [in Polish]. Morawica, Poland: BIP. [http://www.morawicaeobip.pl/bip\\_morawica/index.jsp?place=Menu02&news\\_cat\\_id=198&layout=1&page=0](http://www.morawicaeobip.pl/bip_morawica/index.jsp?place=Menu02&news_cat_id=198&layout=1&page=0); accessed on 17 May 2021.
- Ciesielska M, Boström KW, Öhlander M.** 2018. Observation methods. In: Ciesielska M, Jemielniak D, editors. *Qualitative Methodologies in Organization Studies. Volume II: Methods and Possibilities*. Cham, Switzerland: Palgrave Macmillan, pp 33–52. [https://doi.org/10.1007/978-3-319-65442-3\\_2](https://doi.org/10.1007/978-3-319-65442-3_2).
- Ciupa T, Suligowski R, Wałek G.** 2016. Changes in forest coverage of the Holy Cross Mountains during last 200 years [in Polish with English abstract]. *Edukacja Biologiczna i Środowiskowa* 2016(4):16–23.
- Czamecki A.** 2019. Urbanization of the country and its stages. In: Halamska M, Stanny M, Wilkin J, editors. *Continuity and Change: One Hundred Years of Development of the Polish Countryside* [in Polish]. Warsaw, Poland: Institute of Rural and Agricultural Development, Polish Academy of Sciences, pp 51–76.
- Dameri RP.** 2016. *Smart City Implementation: Creating Economic and Public Value in Innovative Urban Systems*. Cham, Switzerland: Springer.
- Doloi H, Green R, Donovan S.** 2019. *Planning, Housing and Infrastructure for Smart Villages*. New York, NY: Routledge.
- EC [European Commission].** 2018. *Proposal for a Regulation of the European Parliament and of the Council Establishing Rules on Support for Strategic Plans*. Brussels, Belgium: EC. [https://eur-lex.europa.eu/resource.html?uri=cellar:aa85fa9a-65a0-11e8-ab9c-01aa75ed71a1.0003.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:aa85fa9a-65a0-11e8-ab9c-01aa75ed71a1.0003.02/DOC_1&format=PDF); accessed on 10 June 2021.
- EC [European Commission].** 2021. *CAP Strategic Plans*. Brussels, Belgium: EC. [https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-strategic-plans\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-strategic-plans_en); accessed on 12 July 2021.
- ENRD [European Network for Rural Development].** 2017. *EU Action for Smart Villages*. Brussels, Belgium: ENRD. [https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key-policies/documents/rur-dev-small-villages\\_en.pdf](https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key-policies/documents/rur-dev-small-villages_en.pdf); accessed on 10 June 2021.
- ENRD [European Network for Rural Development].** 2018. Smart villages: Revitalising rural services. *EU Rural Review* 26:1–50. [https://enrd.ec.europa.eu/sites/default/files/enrd\\_publications/publi-enrd-rr-26-2018-en.pdf](https://enrd.ec.europa.eu/sites/default/files/enrd_publications/publi-enrd-rr-26-2018-en.pdf); accessed on 4 June 2021.
- EPRS [European Parliamentary Research Service].** 2021. *Smart Villages. Concept, Issues and Prospects for EU Rural Areas*. Brussels, Belgium: EPRS. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/689349/EPRS\\_BRI\(2021\)689349\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/689349/EPRS_BRI(2021)689349_EN.pdf); accessed on 10 June 2021.
- EU [European Union].** 2016. *Cork 2.0 Declaration “A Better Life in Rural Areas.”* Luxembourg City, Luxembourg: Publications Office of the European Union. [https://enrd.ec.europa.eu/sites/default/files/cork-declaration\\_en.pdf](https://enrd.ec.europa.eu/sites/default/files/cork-declaration_en.pdf); accessed on 18 June 2021.
- Euromontana.** 2020. *Towards a Long-Term Vision for Mountains’ Rural Areas*. Brussels, Belgium: Euromontana. [https://www.euromontana.org/wp-content/uploads/2020/11/2020-11-17-Euromontana-Long-Term-Vision\\_EN\\_FINAL.pdf?fbclid=IwAR0qiuR9l8cQrdl2XlPjIT36lJb7TcS4X7YiN\\_JGKAIBiJx8s0VfFp3RfDU](https://www.euromontana.org/wp-content/uploads/2020/11/2020-11-17-Euromontana-Long-Term-Vision_EN_FINAL.pdf?fbclid=IwAR0qiuR9l8cQrdl2XlPjIT36lJb7TcS4X7YiN_JGKAIBiJx8s0VfFp3RfDU); accessed on 10 June 2021.
- EUSALP [EU Strategy for the Alpine Region].** 2021. *Financial Support Mechanisms for Smart Villages and Smart Regions*. Grenoble, France: EUSALP. <https://www.alpine-region.eu/publications/how-finance-smart-village-project>; accessed on 10 June 2021.
- Fennell S, Kaur P, Jhunjhunwala A, Narayanan D, Loyola C, Bedi J, Singh Y.** 2018. Examining linkages between smart villages and smart cities: Learning from rural youth accessing the internet in India. *Telecommunications Policy* 10(42):810–823. <https://doi.org/10.1016/j.telpol.2018.06.002>.
- Goodall SK.** 2004. Rural-to-urban migration and urbanization in Leh, Ladakh. *Mountain Research and Development* 24(3):220–227. [https://doi.org/10.1659/0276-4741\(2004\)024\[0220:RMAUL\]2.0.CO;2](https://doi.org/10.1659/0276-4741(2004)024[0220:RMAUL]2.0.CO;2).
- Goodman LA.** 1961. Snowball sampling. *Annals of Mathematical Statistics* 32(1):148–170.
- Grau HR, Aide TM.** 2007. Are rural–urban migration and sustainable development compatible in mountain systems? *Mountain Research and Development* 27(2):119–123. <https://doi.org/10.1659/mrd.0906>.
- Griffin RW.** 2004. *Fundamentals of Management* [in Polish]. Warsaw, Poland: Polish Scientific.
- Guzal-Dec D.** 2018. Intelligent development of the countryside—the concept of smart villages: Assumptions, possibilities and implementation limitations. *Economic and Regional Studies* 11(30):32–49. <https://doi.org/10.2478/ers-2018-0023>.
- Holmes J, Jones B, Heap B.** 2015. Smart villages. *Science* 350(6259):359. <https://doi.org/10.1126/science.aad6521>.
- Hopkins J, Copus A.** 2018. *Definitions, Measurement Approaches and Typologies of Rural Areas and Small Towns: A Review*. Aberdeen, United Kingdom: James Hutton Institute.
- Hrehorowicz-Gaber H, Gaber T.** 2009. Significance of view analyses in planning studies for small localities in mountain areas [in Polish with English abstract]. *Technical Transactions: Architecture* 106(10):187–192.
- Huang G.** 2017. Modeling urban spatial growth in mountainous regions of western China. *Mountain Research and Development* 37(3):367–376. <https://doi.org/10.1659/MRD-JOURNAL-D-16-00078.1>.
- Ienciu I, Vorovencii I, Oprea L, Popescu C.** 2013. Urban development of mountain areas with the aim of developing local tourism. *Journal of Environmental Protection and Ecology* 14(3):980–985.
- Interreg Alpine Space.** 2020. *SmartVillages. A Synthesis Report*. Salzburg, Austria: Alpine Space. <https://www.alpine-space.org/projects/smartvillages/about-the-project/sv-synthesis-report.pdf>; accessed on 7 December 2021.
- ISOK [National Guard Information System].** 2021. Hydroportal [in Polish]. [https://wody.isok.gov.pl/imap\\_kzgw/?gpmmap=gpWORP](https://wody.isok.gov.pl/imap_kzgw/?gpmmap=gpWORP); accessed on 12 July 2021.
- Jamorska-Kurek A.** 2020. *Smart Village—Piaseczna Górką*. 11th Thematic Group Meeting on Smart Villages, 1 April 2020. Webinar: The European Network for Rural Development. [https://enrd.ec.europa.eu/sites/default/files/3\\_tg11\\_smart-villages\\_pl-village\\_jamorska.pdf](https://enrd.ec.europa.eu/sites/default/files/3_tg11_smart-villages_pl-village_jamorska.pdf); accessed on 4 June 2021.
- Jolley GJ, Lane EB, Brun LC.** 2011. Economic development planning in bedroom communities: A case study of Chatham County, North Carolina. *Journal of Rural and Community Development* 6(1):113–128.
- Kalinowski S, Komorowski L, Rosa A.** 2021. *The smart villages concept: Examples from Poland* [in Polish]. Warsaw, Poland: Institute of Rural and Agricultural Development, Polish Academy of Sciences. <https://doi.org/10.53098/9788389900623>.
- Komorowski L.** 2020. *My Smart Village Competition (2019)*. 11th Thematic Group Meeting on Smart Villages, 1 April 2020. Webinar: The European Network for Rural Development. [https://enrd.ec.europa.eu/sites/default/files/4\\_tg11\\_smart-villages\\_pl-competition\\_komorowski.pdf](https://enrd.ec.europa.eu/sites/default/files/4_tg11_smart-villages_pl-competition_komorowski.pdf); accessed on 4 June 2021.
- Komorowski L, Stanny M.** 2020. Smart villages: Where can they happen? *Land* 9(5):151. <https://doi.org/10.3390/land9050151>.
- Konon A.** 2007. Strike-slip faulting in the Kielce Unit, Holy Cross Mountains, central Poland. *Acta Geologica Polonica* 57(4):415–441.
- Kundzewicz Z, Zaleski J, Januchta-Szostak A, Nachlik E, editors.** 2020. *Water Management Report: Challenges for Poland* [in Polish]. Kraków, Poland: Foundation of Economy and Public Administration. [https://oees.pl/wp-content/uploads/2020/11/raport\\_gospodarowanie\\_woda\\_26110st.pdf](https://oees.pl/wp-content/uploads/2020/11/raport_gospodarowanie_woda_26110st.pdf); accessed on 15 July 2021.
- Lakshmanan VI, Chockalingam A, Murty VK, Kalyanasundaram S, editors.** 2022. *Smart Villages. Bridging the Global Urban–Rural Divide*. Cham, Switzerland: Springer.
- Lisowski A, Grochowski M.** 2008. *Suburbanization Processes: Conditions, Forms and Consequences* [in Polish]. Seminar: Problems of Urban Development, Including Metropolitan Areas in the Concept of National Spatial Development 2008–2033, 28 February 2008. Warsaw, Poland: Ministry of Regional Development. [https://www.researchgate.net/publication/265110412\\_PROCESY\\_SUBURBANIZACJI\\_uwarunkowania\\_forny\\_i\\_konsekwencje](https://www.researchgate.net/publication/265110412_PROCESY_SUBURBANIZACJI_uwarunkowania_forny_i_konsekwencje); accessed on 4 June 2021.
- Maaseutu.** 2020. 32 villages want to be the smartest in Finland. *Maaseutu*. <https://www.maaseutu.fi/en/topical-greetings-from-countryside-and-around-the-world/32-villages-want-to-be-the-smartest-in-finland>; accessed on 17 June 2021.
- Majumdar S.** 2020. Developing integrated SMART villages for rural transformation in response to sustainable development. *Africa Journal of Technical & Vocational Education & Training* 5(1):2–17.
- Nelson PB, Oberg A, Nelson L.** 2010. Rural gentrification and linked migration in the United States. *Journal of Rural Studies* 26(4):343–352. <https://doi.org/10.1016/j.jrurstud.2010.06.003>.
- Nieto E, Broseil P.** 2019. The role of leader in smart villages: An opportunity to reconnect with rural communities. In: Visvizi A, Lytras MD, Mudri G, editors. *Smart Villages in the EU and Beyond*. Bingley, United Kingdom: Emerald Publishing, pp 63–81. <https://doi.org/10.1108/978-1-78769-845-120191006>.
- Nikkhah HA, Redzuan M.** 2009. Participation as a medium of empowerment in community development. *European Journal of Social Sciences* 11(1):170–176.
- Noor KBM.** 2008. Case study: A strategic research methodology. *American Journal of Applied Sciences* 5(11):1602–1604. <https://doi.org/10.3844/ajassp.2008.1602.1604>.
- OECD [Organisation for Economic Co-operation and Development].** 2011. *OECD Regional Typology*. Paris, France: OECD, Directorate for Public Governance and Territorial Development. [https://www.oecd.org/cfe/regionaldevelopment/OECD\\_regional\\_typology\\_Nov2012.pdf](https://www.oecd.org/cfe/regionaldevelopment/OECD_regional_typology_Nov2012.pdf); accessed on 4 June 2021.
- OECD [Organisation for Economic Co-operation and Development].** 2016. *Rural–Urban Linkages*. Paris, France: OECD. <https://www.oecd.org/gov/rural-urban-linkages.htm>; accessed on 12 July 2021.

- OECD [Organisation for Economic Co-operation and Development].** 2020. *Rural Well-Being: Geography of Opportunities*. OECD Rural Studies. Paris, France: OECD. <https://doi.org/10.1787/d25cef80-en>.
- Paniagua A.** 2020. Smart villages in depopulated areas. In: Patnaik S, Sen S, Mahmoud MS, editors. *Smart Village Technology. Concepts and Developments*. Cham, Switzerland: Springer, pp 399–409. [https://doi.org/10.1007/978-3-030-37794-6\\_20](https://doi.org/10.1007/978-3-030-37794-6_20).
- Pérez-del Hoyo R, Mora H.** 2019. Toward a new sustainable development model for smart villages. In: Visvizi A, Lytras MD, Mudri G, editors. *Smart Villages in the EU and Beyond*. Bingley, United Kingdom: Emerald Publishing, pp 49–62. <https://doi.org/10.1108/978-1-78769-845-120191005>.
- Ranade P, Londhe S, Mishra A.** 2015. Smart villages through information technology—Need of emerging India. *International Journal of Information Technology* 3(7):1–6.
- Rodríguez-Pose A.** 2017. The revenge of the places that don't matter (and what to do about it). *Cambridge Journal of Regions, Economy and Society* 11:189–209. <https://doi.org/10.1093/cjres/rsx024>.
- Romero H, Ordenes F.** 2004. Emerging urbanization in the southern Andes. *Mountain Research and Development* 24(3):197–201. [https://doi.org/10.1659/0276-4741\(2004\)024\[0197:EUITS\]2.0.CO;2](https://doi.org/10.1659/0276-4741(2004)024[0197:EUITS]2.0.CO;2).
- Rosner A, Stanny M.** 2017. *Socio-Economic Development of Rural Areas in Poland*. Warsaw, Poland: European Fund for the Development of Polish Villages, Institute of Rural and Agricultural Development, Polish Academy of Sciences. <https://doi.org/10.53098/9788394105068>.
- Salamon S.** 2009. From hometown to nontown: Rural community effects of suburbanization. *Rural Sociology* 68(1):1–24. <https://doi.org/10.1111/j.1549-0831.2003.tb00126.x>.
- Schmidt K, Walz A, Jones I, Metzger MJ.** 2016. The sociocultural value of upland regions in the vicinity of cities in comparison with urban green spaces. *Mountain Research and Development* 36(4):465–474. <https://doi.org/10.1659/MRD-JOURNAL-D-16-00044.1>.
- Slee B.** 2019. Delivering on the concept of smart villages—In search of an enabling theory. *European Countryside* 4(11):634–650. <https://doi.org/10.2478/euco-2019-0035>.
- SRF [Centre of Regional Science].** 2007. *Smart Cities: Ranking of European Medium-Sized Cities*. Vienna, Austria: Vienna University of Technology. [http://www.smart-cities.eu/download/smart\\_cities\\_final\\_report.pdf](http://www.smart-cities.eu/download/smart_cities_final_report.pdf); accessed on 4 June 2021.
- Stanny M, Rosner A, Komorowski L.** 2021. The socio-economic heterogeneity of rural areas: Towards a rural typology of Poland. *Energies* 14(16):5030. <https://doi.org/10.3390/en14165030>.
- Torre A, Corsi S, Steiner M, Wallet F, Westlund H, editors.** 2020. *Smart Development for Rural Areas*. London, United Kingdom: Routledge.
- UN [United Nations].** 1987. *Report of the World Commission on Environment and Development: Our Common Future*. Oslo, Norway: UN General Assembly. <https://digitallibrary.un.org/record/139811>; accessed on 18 June 2021.
- USDA [US Department of Agriculture].** 2019. *What Is Rural?* Washington, DC: USDA. <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural/>; accessed on 10 June 2021.
- Vaishar A, Štastná M.** 2019. Smart village and sustainability. Southern Moravia case study. *European Countryside* 4(11):651–660. <https://doi.org/10.2478/euco-2019-0036>.
- Van Gevelt T, Canales Holzeis C, Fennell S, Heap B, Holmes J, Hurley Depret M, Jones B, Safdar MT.** 2018. Achieving universal energy access and rural development through smart villages. *Energy for Sustainable Development* 43:139–142. <https://doi.org/10.1016/j.esd.2018.01.005>.
- Visvizi A, Lytras MD, Mudri G, editors.** 2019. *Smart Villages in the EU and Beyond*. Bingley, United Kingdom: Emerald Publishing. <https://doi.org/10.1108/978-1-78769-845-120191017>.
- Weingarten P, Copus A, Psaltopoulos D, Skuras D, Terluin I, Sieber S, Rättinger T.** 2010. *Building a Typology of European Rural Areas for the Spatial Impact Assessment of Policies (TERA-SIAP)*. Joint Research Centre Technical Report Series 58493. Luxembourg City, Luxembourg: Publications Office of the European Union. <https://publications.jrc.ec.europa.eu/repository/handle/JRC58493>; accessed on 12 June 2021.
- Wilson V.** 2014. Research methods: Triangulation. *Evidence Based Library and Information Practice* 1(9):74–75.
- Wolski O.** 2019. Smart villages in EU policy: How to match innovativeness and pragmatism? [in Polish with English abstract]. *Wiś i Rolnictwo* 4(181):163–179. <https://doi.org/10.7366/wir042018/09>.
- Zweglińska-Gałecka D.** 2019. Rural gentrification and its scope [in Polish with English abstract]. *Wiś i Rolnictwo* 2(183):57–87. <https://doi.org/10.7366/wir022019/03>.