

SMART VILLAGE – USING NEW OPPORTUNITIES IN THE DEVELOPMENT OF RURAL AREAS

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Purpose: The main purpose of this paper is to identify new opportunities for the development of rural areas. A contribution to this should be the combination of modern tools and technologies that affect the improvement of the quality of life and the possibility of creating new jobs in rural areas.

Design/methodology/approach: The paper employs the desk research method in the form of an analysis. The analysis of the available literature on the subject on smart villages and the examples of smart villages described in the paper rendered it possible to establish the facts, verify the data and present the results.

Findings: The considerations presented in the article indicate that a key element in smart villages is smart human resources that respond to challenges and changes occurring in rural areas. In order to make a real change in a given area, collective action is required rather than individual, and, depending on incentives and local circumstances, these initiatives may prioritise economic, social or environmental issues – or a combination thereof.

Practical implications: A common space for development and shared commitment of the rural population enables building social ties as an integral functioning of Smart Villages.

Social implications: The needs of the rural community should always come first and the implemented solutions should be adjusted according to these needs, bearing in mind what resources that a given community has.

Originality/value: The article is an original approach to the search for intelligent solutions that are meant to improve the development of rural areas and make life easier for rural residents.

Keywords: rural areas, smart village, new opportunities, development, projects.

Category of the paper: research paper.

1. Introduction

Various disciplines deal with rural issues, including economics, sociology, agricultural sciences, geography, demography, ethnography and anthropology. Representatives of these sciences have developed dozens of definitions, each representing a village or rural area and the inhabitants of this area from a different perspective (Stanny, 2014). The main problem in studying the changes that occur in rural areas is the very definition of the term "rural area". It would seem that this term is broadly and well understood, but its correct definition poses much more difficulty. A village is a settlement unit where farmers live and work. They mainly deal with plant and animal production. A rural area is considered to be the area made up of individual villages, including their surroundings. The definition of rural areas should be treated flexibly as these areas are constantly changing. During the dynamic modernisation of the countryside, rural areas were characterised mainly as a place associated with agricultural production (Krakowiak-Bal et al., 2018).

One of the main features of rural areas is their heterogeneity, expressed in their multifunctionality and re-evaluation of rural regions towards new production and service opportunities. The method of distinguishing and classifying rural areas is changing (Gralak, Kacprzak, 2021). There are six types of delimitation approaches in the literature (Féret, 2020):

- an administrative approach, of legal and administrative nature,
- a demographic approach, based on the population criterion, i.e. population density,
- a location approach, based on spatial relations between urban and rural areas,
- an economic approach (structural and functional), based on such criteria as the share of agriculture in the GDP or cost of services,
- a landscape approach, based on land cover and climatic conditions,
- a combined approach that uses a combination of at least two different approaches.

For the needs of the Central Statistical Office (GUS), rural areas in Poland are distinguished on the basis of the territorial division of the country (the administrative approach) using TERYT identifiers. According to this classification, rural areas are those areas which remain outside the administrative borders of cities and include rural boroughs and rural areas of urban-rural boroughs (Borawska, 2017). Bański (2012) describes rural areas using seven features (Figure 1).

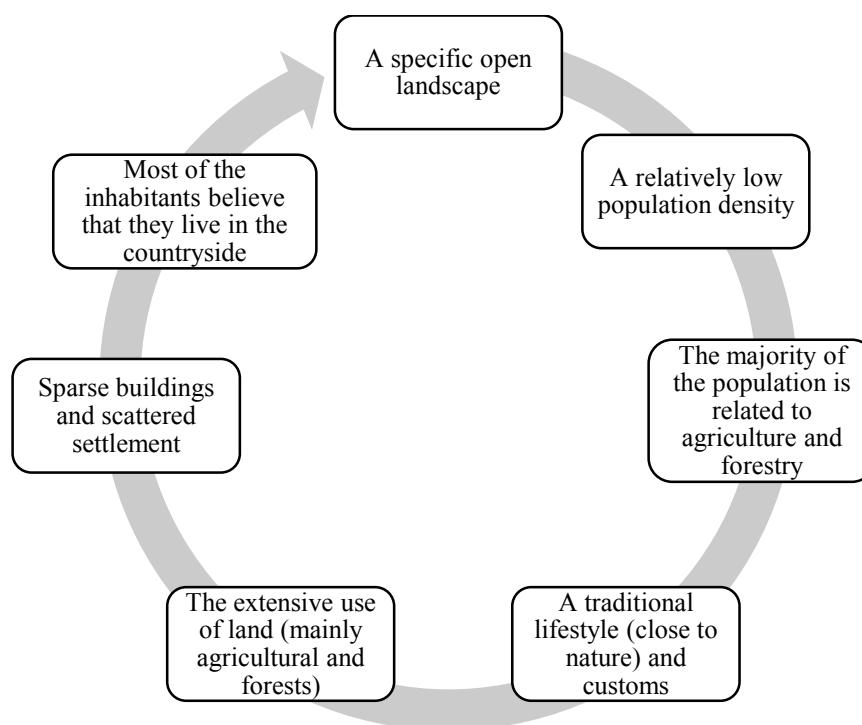


Figure 1. Features of rural areas. Adapted from: „Problematyka definicji i zasięgu przestrzennego obszarów wiejskich i stref podmiejskich” by J. Bański.

The implementation of the concept of multifunctionality consists in diversifying the socio-economic activity of villages in order to increase the sources of income from outside the farm, which include other sectors of the economy, e.g. the development of non-agricultural activities in rural areas (Roszkowska-Mądra, 2009). The multifunctional character of rural areas is the concept of shaping the rural development strategy, e.g. based on the non-agricultural economic activity of its inhabitants (Heller, 1998). The essence of multifunctional development is primarily local economic entrepreneurship, supported by various forms of capital inflow (Adamowicz, Zwolińska-Ligaj, 2009).

The paradigm of multifunctional rural development focuses mainly on achieving economic effects. The opposite is the revitalisation paradigm which includes social aspects into the deliberations on the development of rural areas. The countryside is primarily supposed to be the living space of its inhabitants (Wolski, Sykała, 2016).

Smart rural development allows local and regional aspects of rural development. The idea concerns the manner of operation under the conditions of change and the kind of response to challenges, not specific rural areas (Wolski, Wójcik, 2018). As Idziak (2019, p. 5) states, *what is happening in the Polish countryside depends on events, trends and decisions made in many places in the world*. The concept of smart villages is often the key to any attempts to solve the problem of depopulation and to stimulate services and development opportunities in rural areas. It is based on a functional, cross-sector approach and does not only affect the lives of rural residents, but also applies to people from outside the local community, including those involved in rural development, lawmakers, entrepreneurs, NGOs, etc. In smart villages, it is the people

who matter most. Rural residents matter when they take the initiative to find practical solutions, both in terms of some serious challenges that they have to face and, what is important, in terms of taking advantage of attractive opportunities that result in the transformation of rural areas (Kacprzak, 2019).

The definition of smart villages is concentrated around the features and approaches of rural communities (Wolski, Wójcik, 2019):

- skilful use of digital technologies, which bring us closer to the achievement of the assumed goals,
- consideration beyond the village boundaries. Although actions are taken at the local level, it is noted that the village is linked to larger urban centres and other villages,
- creation of innovative cooperation forms and communities of interests, thus bringing farmers, local governments, the private sector and society together,
- independent thinking is also important. Villages themselves assess their resources, select the most appropriate know-how and take the initiative to shape the reality that surrounds them.

The smart community is a key element in smart villages. It is thanks to appropriate human resources that it is possible to address the challenges and changes occurring in rural areas. The very areas of intelligent activities can be classified in three main areas of intelligent solutions (Kamiński and Leśniak, 2019):

1. Public services, i.e. e-health, e-care, remote education, transport (e.g. *telebuses* – public transport on demand), energy (e.g. RES), as well as security (e.g. CCTV surveillance).
2. Public management, i.e. e-government, waste management (e.g. container filling sensors), spatial planning (e.g. digitisation), as well as environmental monitoring (e.g. air quality sensors).
3. Entrepreneurship, i.e. precision farming, online trade (e.g. local products), rural tourism (based on intelligent solutions), and sharing (e.g. specialised equipment).

Current initiatives of smart villages focus on one or more of the wider aspects and conditions of rural development where collective action, rather than individual, is required to make a real change. Depending on local circumstances and motivation, these initiatives may prioritise economic, social or environmental issues – or a combination thereof. There is no need to do everything at the same time (ENRD, 2021).

The concept of smart villages appeared in the rural development policy of the European Union as an analogy to the concept of smart city, in view of the need to implement the stipulations of the Europe 2020 Strategy. And, although the Smart City idea is already being implemented in many Polish cities thanks to projects and programs related to the use of intelligent technological solutions, such as public Wi-Fi networks, intelligent traffic control or various sensors, meters and controllers, another important step is to create further development, also with active participation of residents, as in the case of Smart Villages – Smart Cities 3.0 (Kalinowski et al., 2021).

2. Material and methods

The aim of the article is to indicate new opportunities for the development of rural areas. The paper employs the desk research method in the form of an analysis. The analysis of the available literature on the subject on smart villages and the examples of smart villages described in the paper rendered it possible to establish the facts, verify the data and present the results.

3. A practical approach to the use of intelligent solutions

According to the EU Measure, smart villages are *rural areas and communities that make use of their existing strengths and assets as well as emerging new opportunities*, in which *traditional and new networks and services are improved through digital and telecommunications technology, innovation and a better use of knowledge* (ENRD, 2021, p. 3). There are currently noticeable trends among rural communities relating to the search for intelligent solutions to local problems. The importance of these activities concerns more and more than just digital technologies. Although digitisation and the growth of networking in rural areas are a key element of development, innovative solutions also include the social, economic and environmental scope (Godlewska, 2020) (Figure 2).

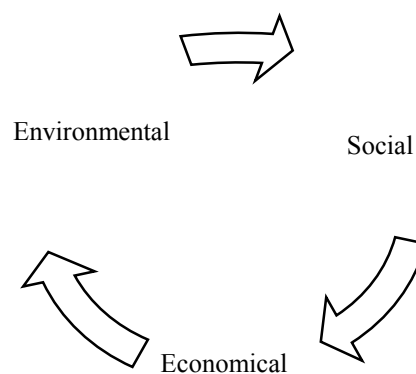


Figure 2. Additional range of innovative solutions. Adapted from: „Inteligentna wieś jako nowa koncepcja rozwoju obszarów wiejskich” by N. Godlewska.

When looking for smart solutions to enhance rural development, the link between smart village strategies at the local level and existing wider strategies should be considered. The broader strategies include e.g. digital strategies at the regional level or regional smart specialisation strategies. By combining these two strategies, rural communities have a better chance to implement and achieve their goals (ENRD, 2021). Smart solutions should be found everywhere. Sometimes a seemingly ordinary project can become innovative after implementing a few changes. The focus should not be placed on one of the possibilities, because

it alone does not create a good product, which could be called intelligent development. Therefore, actions should be combined to create something more unique, which will set an example of sensible management of space and resources. The source of inspiration for creating intelligent solutions are the resources provided by nature, e.g. for the production of own electricity. With agricultural production and the simultaneous use of modern technologies, a farm takes on a new dimension. It is thanks to the easiest obtainable resources and taking innovative actions that something extraordinary can be created, which makes us more self-sufficient (Godlewska, 2020).

An example of the use of intelligent solutions is the production and conservation of energy. There are many opportunities to be able to create something better than before, to rationally approach energy management and use it more efficiently. It might seem that the improvement of safety among the inhabitants of rural areas and care for the environment are not innovative solutions. Sometimes, however, little is enough. It would suffice to approach this area sensibly and introduce solutions that will make people's lives easier. This subject offers a number of possibilities for an intelligent approach. These include solutions that enable the implementation of modern methods of obtaining energy and its appropriate use (Figure 3).

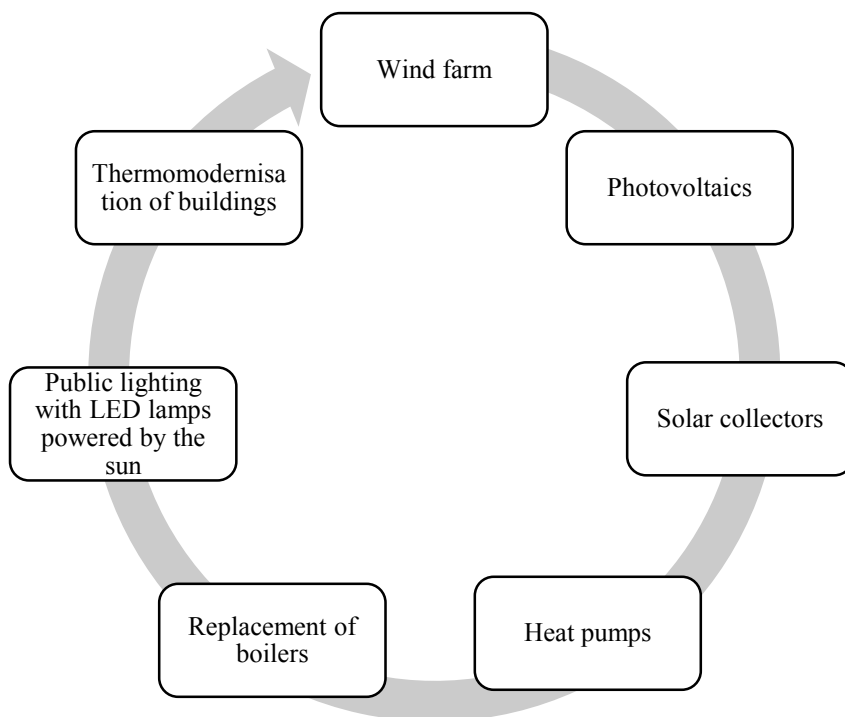


Figure 3. Additional energy use. Adapted from: Smart village – pomysł na „Inteligentną wieś” by K. Malecka.

Intelligent activities relate to various fields, including health and care. In this approach, particular attention should be paid to the selfless willingness to help the other person. Solutions should be found that would facilitate the continued peaceful life of the elderly and ailing part of the rural community. Special assistance should be provided to a larger number of patients who live alone and do not receive any support from the healthcare system. Most of these

residents are not even capable of attending a health center as the place is located a few kilometers from the person's residence.

Education is an extremely important element in the search for intelligent solutions. It is in this area where all the development success is placed. A series of measures should be implemented to facilitate the adaptation of children and young people to digital technologies, which increasingly concern everyone. The possibilities of searching for intelligent solutions should also include entrepreneurship, comprehensive rural development, communication between rural residents, common space and joint action, and sport (Malecka, 2021) (Figure 4).

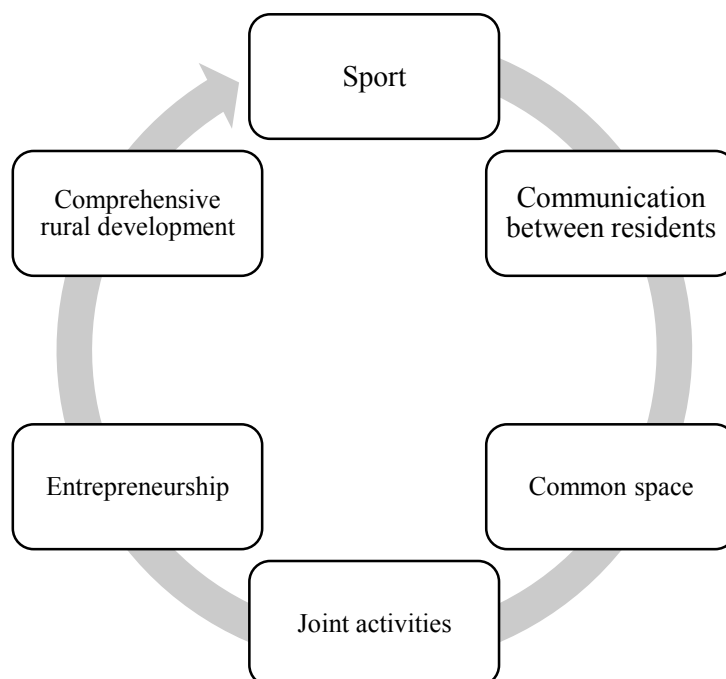


Figure 4. Search for intelligent solutions. Adapted from: Smart village – pomysł na „Inteligentną wieś” by K. Malecka.

There are a number of other opportunities offered by an intelligent approach to rural development. The needs of the rural community should always come first and the implemented solutions should be adjusted according to these needs, bearing in mind what resources that a given community has.

The common space for development enables building social bonds as an integral measure of smart villages. An example is an overgrown pond in the village of Spórok in the area of the city of Opole, which has been turned into a pleasant meeting and resting place by the collective efforts of the inhabitants. The works were performed as part of the Village Renewal. Another measure is the Astronomical, Cultural and Educational Centre in Niedźwiady, in the borough of Szubin. It was established on the initiative of astronomy enthusiasts gathered in the Pałucko-Pomorskie Astronomical and Ecological Association (Malecka, 2021).

4. Examples of the use of intelligent solutions in rural areas

The Smart Villages concept of rural development is an ideal example of positive changes that the countryside can undergo. It is possible to increase the efficiency of management and service provision and to improve the competitiveness of rural areas, while respecting the economic, social and environmental needs of current and future generations (Kamiński, Leśniak, 2019). Smart Villages is a community with an idea for its problems and its future; it is a village that uses the possibilities of modern technology, while caring for the planet Earth with which its fate is connected (Czy masz pomysł..., 2021).

A good initiative for intelligent rural development is the herbal manufactory "Lawendowe Pole" located in Nowe Kawkowo, in the countryside of Warmia. The owner left her job in Warsaw to move to the countryside. She is a very creative person. Pursuing her life passion, she runs Alchemical Lavender Workshops, offers agritourism services, has created the Living Lavender Museum and the Secret Garden of usable and forgotten herbal plants. In the living museum, a new workshop room was created, which is used for the needs of education and activation of the local society, as well as tourists visiting the Lavender Museum. In the workshop room, educational activities for children, adolescents and adults are conducted in the field of culture, art, ethnography, herbal medicine, ecology, sustainable agriculture and aromatherapy. The room was co-financed by the European Union funds under the Measure "Support for local development under the LEADER initiative" and under the Sub-measure 19.2: "Support for the implementation of operations under the community-led local development strategy" of the Rural Development Programme for 2014-2020. In addition, a herbal shop was established in the manufactory, where selected products made on the farm can be purchased (Kacprzak, 2019).

Another example is the Sudety Educational Farm. It is a modern, interactive education center where the fascinating past of the Earth is presented. It is located in the heart of the Land of Extinct Volcanoes which is in the region of the Kaczawskie Mountains. The farm was created by the Kaczawskie Association with the support of the European Union and the Provincial Fund for Environmental Protection and Water Management in Wrocław. Here, knowledge and skills are transferred in an interactive, dynamic way, based on models, digital visualisations and self-conducted experiments (Sudety Farm, 2021; Kamiński, Leśniak, 2019).

A modern, ecological sports and entertainment hall was built in the borough of Ryczowół. The hall is used by the children from schools and kindergartens, as well as members of sports clubs, youth, adults and seniors. The hall is equipped with CCTV monitoring, which makes it safe. There is modern sports equipment for handball, football and volleyball. The sports and entertainment hall was built with the support of the Provincial Fund for Environmental Protection (over PLN 1.8 million of preferential loan) and the Ministry of Sport and Tourism (PLN 3.5 million) (Gembiak-Binkiewicz, 2021).

The value of the hall is the possibility of activating a large group of residents, as well as integration. The hall has conference rooms where various social and official meetings are held (Kalinowski et al., 2021).

Examples of smart villages can be found not only in Poland. An example is the "Strategy for Internal Areas" in Italy. It was established to counteract depopulation of rural areas. In Finland, depopulation and digital transformation were also addressed through the "Smart Rural Project". In France, the "Mutual Agreements" were conducive to creating links between villages and cities and the benefits of the digital transformation were fostered by the "Digital Villages" initiative in Germany (Boba, 2019). There are also many other local projects. For example, the aim of the "Broadband Fibre" project in Östra Bräcke was to provide 150 km of the Internet cable for residents of the municipality of Östra Bräcke in Sweden, with all its benefits. 272 broadband Internet connections were created (Broadband Fibre..., 2021). The "Mallu Does The Rounds" project provided an easily accessible medical service to rural Finnish residents, using the Mallu bus. The measures concerned the conversion of a mobile caravan and equipping it with a mobile healthcare centre. Nurses provide a suite of medical services from a mobile unit, and an on-board computer and broadband connection link nurses to centralised patient information systems. The Mallu bus project helped to prevent disease and supported the independent lives of older villagers (Mallu Does..., 2021). Last but not least, the goal of the "Socially Responsible Wine Tourism" project was to promote sustainable and socially responsible wine tourism by contributing to the establishment of the thematic Wine Trails and increasing tourist visits to wine growing regions across Spain (Socially Responsible..., 2021).

Summary

The concept of smart villages is a relatively new concept that does not propose one universal solution – it is territorially sensitive, based on the needs and potential of a given territory with a development strategy and supported by new or existing strategies covering territorial areas (EU Action for..., 2021). Not only is technology important, but also business development, investments in infrastructure, human capital, production, good governance and citizen involvement matter. As technology is changing the world, it must be adapted and used in a smart way. The smart solution approach in rural areas primarily concerns people and their initiatives. Smart villages are smart communities with certain characteristics and attitudes that enable them to respond to the challenges arising from changes in rural areas. This requires rural communities to change the way they think about development and what they do to develop (Wolski, 2019).

Smart villages pay attention to e-literacy solutions, access to e-health and other essential services, innovative solutions for the environmental protection, promotion of technology-supported local products, etc. They include human settlements in rural areas and their surrounding landscapes. Smart village means looking for solutions to the improvement of the quality of life, underinvestment, aging society, depopulation, improvement the quality of services and security, respect for the local environment, insufficient job offers or the digital divide.

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