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SŁAWOMIR KALINOWSKI ŁUKASZ KOMOROWSKI ANNA ROSA

THE SMART VILLAGE CONCEPT

EXAMPLES FROM POLAND

IRWIR PAN

the smart village
CONCEPT
EXAMPLES FROM POLAND

the smart village
CONCEPT
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SŁAWOMIR KALINOWSKI, ŁUKASZ KOMOROWSKI, ANNA ROSA

IRWIR PAN Polish Academy of Sciences
Institute of Rural and Agricultural Development

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Introduction

The transformation of rural areas and the broadly understood problems of their development have been the subject of scientific analyses and lively public debate for many years. The ongoing discussions stem from a reflection on the increased effectiveness of rural development policies and the search for new approaches to their programming at the local level. They are also the result of a growing feeling that it is necessary to achieve sustainable development objectives more effectively and reduce social and economic disparities between rural and urban areas. Among the emerging challenges in the last decade, the transition to an information society has come to the fore, however it should be stressed that the changes taking place are dependent on global technological and digital development. The fact that rural areas are inhabited by about one quarter of the European Union's population makes us aware of the importance of these changes in rural areas. In Poland, this proportion is much higher and amounts to 40%. Being aware of this fact, it may be assumed that adaptation to transformations cannot be treated as an opportunity, but as a necessity, as more and more activities are carried out in the virtual world. The importance of digital and communication technologies has been reinforced in recent months due to the COVID-19 pandemic, which has transferred some activities to the virtual sphere. Equipping rural populations with digital and communications skills will make it possible to "reduce" distance, thereby increasing accessibility to goods and services, especially public ones. In this context, information and communication technologies (ICT) are treated as an opportunity to overcome development-related difficulties. However, their use depends on access to the internet in a given area. Its lack or poor coverage in a particular area deprives it of the opportunities for development based on smart technologies or smart initiatives.

As regards the local dimension, it is not only digital technologies that are growing in importance, but also activities aimed to improve broadly understood living conditions of rural residents, also on a micro scale. In these transformations, people and their skills are of unique value, and waiting passively for change does not make much sense. In this context technology can only be a tool, as human competences are becoming the major driver for the improvement of the standard of living and quality of life. Well-identified local human resources form the basis for social innovation, and consequently contribute to increased resilience of rural areas, allowing them to solve problems faced by local communities. The transition to an information society understood in this way has a significantly broader context than digital and communication technologies and comprises a range of social and agri-environmental issues.

The concept of rural development proposed by the European Union, called smart villages (SV), is primarily addressed to villages that are "in decline" due to their remoteness and progressive depopulation. The first and most often replicated definition

of smart villages was laid down in a 2017 document on the European Union's endeavours in respect of this idea. Smart villages are defined as those villages (local communities, regions) which exploit digital technologies and innovations in their daily life, thereby improving the standard of public services and making better use of local resources. Therefore, it may be concluded that the European Union proposes support for developing peripheral areas based on digital technologies and smart innovations. Joining the discussion on the assumptions of the concept, that are being worked out now, we have wanted to consider whether these areas have conditions for development based on smart solutions. We have accepted the assumption that smart villages begin where reflection takes place on how to use digital technologies to create a space where local development leaders can more easily take account of the needs and possibilities of their residents. The adoption of such an approach allows us to think about what elements are necessary in this process. In order to give an answer, we have identified some Polish examples as well as challenges and mechanisms of the development of smart villages.

The identification of examples of smart villages, followed by an in-depth study of the initiatives implemented is an important step towards understanding the overall concept. The reason behind dealing with this topic was the conviction of its importance in both theoretical and applied contexts. Therefore, we have decided to pursue two objectives: cognitive and application-oriented, while looking for answers to the following questions:

1. How is the concept of smart villages understood by different groups of village residents (initiators, beneficiaries and local authorities)?
2. What mechanisms impact the de-marginalisation of rural areas?
3. How should support for smart villages in the coming years be programmed?
4. What are the necessary resources to implement smart initiatives?
5. What is the impact of smart solutions on the surroundings?
6. What guarantees the sustainability of solutions?
7. Are the concepts of smart villages and smart city related in terms of meaning?

By identifying these problems as well as by describing the existing solutions, we want to achieve the objective of applicability by pointing to the solutions that would become a kind of benchmarking for other regions, counties [*powiat* in Polish], municipalities or *sołectwos* (a term describing one or more villages or an auxiliary unit of the municipality). We would like to emphasise that it is still necessary to look for solutions that can be an example for other villages and to bear in mind local limitations related to resources. The cognitive aim is to acquire knowledge of the smart village concept.

The book's structure is the consequence of the methodological assumptions and objectives of the research project. It consists of a theoretical/methodological and an empirical/descriptive part. Section 1 describes the concept of smart villages and presents its journey from an idea to the development instrument. It presents evidence

showing that the idea has all the attributes of the scientific concept, underlining at the same time its practical potential. The motives for implementing the concept are characterised by pointing to five drivers for the creation of smart solutions in rural areas: responding to depopulation and demographic change, finding local solutions to public funding cuts and the centralisation of public services, exploiting linkages with small towns and cities, maximising the role of rural areas in the transition to a low-carbon, circular economy, supporting digital transformation. In addition, the process of marginalisation of rural areas called the "circle of rural decline" has been mentioned. It describes how the SV concept is implemented in European Union policy, referring to the selected EU measures and documents. Section 1 also presents the challenges that the concept faces in order to enhance quality of life by creating more resilient social structures, using available resources and tools. Moreover, the Section compares the smart village concept with that of the smart city and points to the similarities and differences between them.

Section 2 presents the concept behind the field study. The organisation and methodology of this study are explained in detail. In addition, the basis for the selection of both the target group surveyed and municipalities participating in the study are discussed, justifying the deliberate selection of ten municipalities. Scenarios for individual in-depth interviews broken down into three study groups are presented, followed by the characteristics of the municipalities and the initiatives implemented in these municipalities.

Section 3 shows the contextual nature of the initiatives and their intertwining. It has been noted that the division into infrastructural-technological, social, and agri-environmental solutions is conventional. In each case the reasons behind the implemented initiatives have been presented. In addition, the way they were implemented as well as their effects and sustainability have been discussed. The importance of particular groups of resources during the implementation of the ideas has also been pointed to. A significant part of particular subsections is devoted to an attempt at defining the infrastructural-technological, social and agri-environmental contexts for the implementation of smart village initiatives.

Section 4 presents similarities and differences in the understanding of the concept of smart villages by different groups of respondents. This has been particularly important from the perspective of the pursuance of the project objectives. The respondent groups included initiators, beneficiaries and local authorities. Moreover, the section describes the reasons behind the initiatives undertaken in selected municipalities. Attention has been drawn to the process of involving the local community and collaboration between groups under study. The impact of the projects on their surroundings and the constraints to their implementation has been shown. Also, the presentation of ideas for supporting local leaders has a prominent place in the section.

The last section, which replaces the traditional summary, consists of two parts. The first part shows why it is worth creating smart solutions. The processes of depopula-

tion and population ageing cause villages to face new challenges. Therefore, it is vital in this context to create new smart solutions that meet the needs of the residents while respecting the idea of sustainable development. The second part of the section offers recommendations for developing the smart village concept in Poland made during project implementation.

The book is the result of a research project implemented under the Operational Plan for 2020-2021 of the Polish Rural Network's NSU entitled "**In-depth Study of Smart Villages in Poland – Selected Examples**", under Priority 1. Fostering knowledge transfer and innovation in agriculture, forestry and rural areas. The motivation for the project was the *My SMART Village* competition organised in 2019 by the Institute of Rural and Agricultural Development of the Polish Academy of Sciences (IRWiR PAN). The competition also inspired us to conduct further in-depth studies of the selected initiatives.

The publication is addressed to persons from various backgrounds who are looking for information on the smart village idea: representatives of local governments, local government employees or local leaders who are the "driving force" capable of mobilising their local community. The book may also be useful for rural residents because it is up to them to decide what their life would be like there. The topics discussed in the book are in line with the current discussion on smart villages. In the new EU programming period, funding is envisaged for rural areas under the Smart Villages Programme until 2027. We wanted to present various initiatives and smart solutions and to disseminate the selected practices in this field. The readers will find in the book suggestions and ideas that can be modified or improved, but above all adapted to their own and their community's needs. We hope that it will be an inspiration for those who still have doubts whether it is worth undertaking such initiatives at all. Its advantage is combining theoretical considerations with practical experience that we acquired during the *My SMART Village* competition, and during in-depth studies conducted in selected municipalities.

It is the conviction of the authors that the book does not exhaust smart village issues. The book is an invitation to further deepen the topic and to look for solutions which may contribute to enhancing the quality of life in rural areas. In addition, on the one hand, it is a form of benchmarking showing examples of existing solutions, and on the other hand – a form of encouragement to look for someone's own recipes aimed at creating smart/creative areas. The publication attempts to analyse the concept of smart villages at various levels and show its importance in today's digital world. Its aim is to show that the solutions do not need to have the nature of cost-intensive investment projects, but also – or may be first and foremost – of micro projects improving the situation of rural inhabitants.

The book "Concept of Smart Villages. Examples from Poland" is a supplement to the research already carried out in Poland by, among others, Oskar Wolski (2018), Marcin Wójcik (2018), Magdalena Zwolińska-Ligaj, Danuta Guzal-Dec and Mieczysław Ada-

mowicz (2018), Ryszard Kamiński and Leszek Leśniak (2019), Andrzej Hałasiewicz (2020), Łukasz Komorowski and Monika Stanny (2020), Mieczysław Adamowicz (2021), and in the European Union by Veronika Zavratnik et al. (2018), Simona Stojanova at al. (2021) or Evgenia Anastasiou et al. (2021).

We would like to thank everyone who showed us kindness during the collection of information and during the interviews, in particular the participants in the study who devoted their time, the initiators of individual smart solutions for their support and assistance with the in-depth studies. We would also like to thank Professor Tomasz Wojewodzic from the Agricultural University in Kraków for reviewing the monograph and for his valuable comments.

1. *Smart villages*
– FROM AN IDEA TO A RURAL DEVELOPMENT INSTRUMENT

1. *Smart villages* – from an idea to a rural development instrument

1.1 Idea of smart villages – theoretical overview

Although it has all the attributes of a scientific concept, the smart village idea is very often described without any reference to theory, research, or scientific publications. It is based on practical solutions which causes numerous scientists to regard it as lacking a solid theoretical basis. Among others, Bill Slee (2019) has challenged the theoretical aspect of the idea, writing that the evolution of support for local community development and generally of what is referred to as smart villages has taken place almost without reference to theory. However, recently there has been an increased interest among researchers in the concept, which translates into a growing catalogue of publications containing both theoretical and inductive considerations, in which 'smart villages' have become one of the key words. It remains to be seen whether this is a scientific issue or perhaps one of the practical ways of improving the socio-economic situation of rural inhabitants. Or maybe they are not mutually exclusive?

Accepting Kazimierz Ajdukiewicz's definition (1985) that science is an area of knowledge which is a collection of information based on previous research, and a research process leading to obtaining rational knowledge (based on a system of statements and hypotheses concerning a human being, society or economic phenomena), it can be assumed that the research to date on the smart village concept fulfils these prerequisites. If we add that such research results from the need to satisfy the curiosity about the world, to make progress of civilisation, to solve a scientific problem or to explore certain phenomena occurring in society, it may be assumed that both the scientific and inductive basis for the concept is provided. The scientific character of smart villages is also demonstrated by the fact that the term accumulates all functions of knowledge: descriptive-theoretical (a descriptive function), explanation (understanding the cause and effect relationship), foresight (prediction and forecasting) and pragmatism (a practical function). A diagnostic function using heuristic research could also be added to these elements of scientific cognition.

The smart village concept is still in the early stages of development. Its theoretical foundations are being systematically developed. Paraphrasing Karl R. Popper (1992), it can be considered that this is the stage when the tension between knowledge and ignorance arises. This is confirmed by the search for a definition of smart villages which would correspond to the specific features of rural areas and its actual field of interest. Studies on the concept are carried out at different territorial levels comprising whole continents (van Gevelt et al., 2018; Doloi et al., 2019), individual countries (Fennell et al., 2018; Komorowski, Stanny, 2020) or smaller administrative units (Vaishar, Šťastná, 2019; Adamowicz, Zwolińska-Ligaj, 2020). The topics dealt with in

them are very diverse. Papers from Asia, Africa and the Americas mostly focus on energy systems, climate and sustainable agriculture (Adesipo et al., 2020; Majumdar, 2020), while European studies explore the topic mainly in the context of revitalising local communities through improved public services and the use of new technologies (ENRD, 2018a; Visvizi et al., 2019).

Scientific papers to date show a relatively large "practical" potential of the smart village concept in many dimensions, e.g. in mitigating the negative effects of rural depopulation (Paniagua, 2020), as a driver for sustainable rural development (Guzal-Dec, 2018; Adamowicz, 2021) or as an instrument for mobilising local communities (Nieto, Brosei, 2019; Anastasiou et al., 2021). Terry van Gevelt and John Holmes (2015) expect very broad social and economic effects from the concept. They treat smart villages as a strategy that can improve the quality of life and give younger generations good reasons to stay in villages rather than migrate and seek their place in the city.

The notion of smart villages has been used for a short time, however changes in its scope can be observed. Initially it was used to refer to aid programmes in Africa and Asia. The vision of smart villages was first presented in 2015 by van Gevelt and Holmes (2015). It referred to these two continents. It placed emphasis mainly on the issues of residents' access to modern energy sources, food security, primary education and health care. An important moment for the development of the smart village concept in the European Union was the 2016 declaration "A Better Life in Rural Areas" (EU, 2016) (commonly known as the Cork 2.0 Declaration). The document was the result of the meeting of several hundred participants in the European Conference on Rural Development in Cork, Ireland, during which the directions for rural development and agricultural policy were hammered out. One of the points of the declaration emphasised that particular attention should be paid to overcoming the digital divide and developing the opportunities offered by better quality networks and digitalisation in rural areas.

In 2017 the European Network for Rural Development (ENRD) proposed an "EU Action for Smart Villages" (ENRD, 2017). The document deals with the process of debate on the villages of the future and the need to bring different programmes together to build a strategic approach to promoting smart villages, including support for knowledge, investments and connectivity. The paper lays down the initial definition of the concept of smart villages: "**Villages (local communities, regions) that use digital technologies and innovations in their daily life, thereby enhancing its quality, improving the standard of public services and making better use of local resources**".

The definition of smart villages, which seems to have gained acceptance among researchers and practitioners dealing with this issue, accurately reflects its essence and is confirmed in practice. However, are all the elements taken together in the commonly accepted definition (digital technologies and innovations, quality of life, public services, local resources) indispensable for the existence of smart initiatives?

Based on our experience related to the *My SMART Village* competition and in-depth studies in ten municipalities, it seems that the essence in this approach are not all the elements taken together, but their appropriate configuration adapted to the conditions of a particular village. The studies carried out show (more on this in the following sections) that it is acceptable not to have one of the elements – most often digital technologies (as a rule they do not play a leading role, but a supporting one, they are a tool in a given initiative). Technologies are so common in our lives that their presence is often almost obvious. This was the case with many initiatives that in their essential part were of a social nature and did not use digital innovations directly but were more focused on the involvement of local resources, the renewal of rural services or the improvement of living conditions.

The development of the smart village concept is seen as an opportunity for an easier and more comfortable life of rural residents. At the same time, the need to respond to the problems of population ageing and decline in public services is emphasised. **A crucial aspect of the concept is territorial sensitivity, which enables adaptation of the projects implemented under it to local conditions.** The indispensable elements of the concept are: smart initiatives, smart community, smart services, smart institutions, smart infrastructure (Figure 1.1). Smart initiatives should be understood as any local activities aimed at satisfying the specific needs of local residents, carried out or initiated by these residents, supported by new technologies to the greatest extent possible (and if justified).

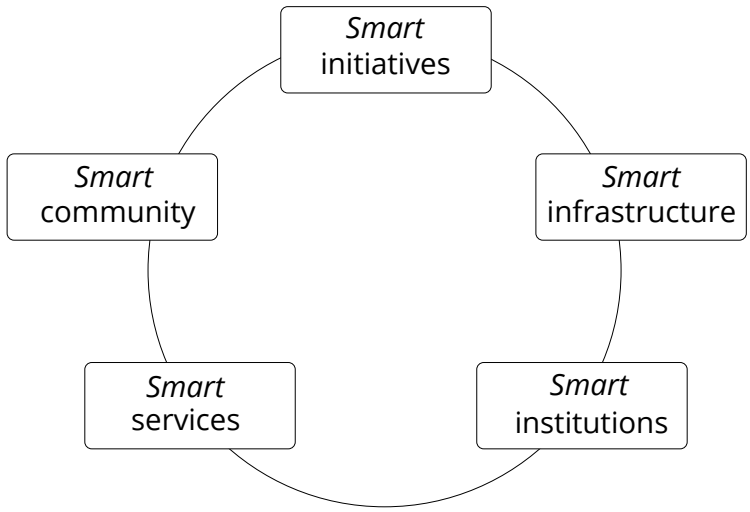

Figure 1.1. Diagram of key elements of smart villages
Source: Komorowski, Stanny (2020).

Smart communities, in turn, are the residents of a given territorial unit (e.g. a municipality, *sołectwo*, hamlet), who engage in local affairs, are capable of expressing their needs and then co-decide and join in the activities to fulfil these needs. For the smart village concept, the local leader (e.g. head of the municipality, head of the village, activist) is of great importance: s/he is able to listen to the residents and take their voice into account. As regards smart services, it should be borne in mind that they are not only public and social services that are based on technological novelties, but also those necessary for a specific area (i.e. tailored to the needs). The local government is responsible for providing most of such services but it is desirable that it cooperates with other local government units, the non-governmental sector and businesses. As far as smart institutions are concerned, it should be remembered that these are public institutions, e.g. a municipality office, school or cultural centre, which use modern solutions, at the same time making such tools available to the residents. Equally important within the concept of smart villages is smart infrastructure as the necessary material foundation for any human activity (Komorowski, Stanny, 2019). In case of rural areas, it is primarily transport infrastructure enabling the mobility of residents, municipal infrastructure significantly influencing the living conditions of the rural population, and the ICT infrastructure allowing residents to deal with matters faster, to make use of public services conveniently and to communicate with other members of the local community.

Based on the analysis of the actions taken in rural areas, it may be noted that they most often relate to three main solutions: in the field of public services, public governance and entrepreneurship (Table 1.1.).

Table 1.1. Some examples of thematic areas of smart actions

Field of solutions	Public services	Public governance	Entrepreneurship
Areas of intervention	energy	e-administration	precision farming
	safety	waste management	online commerce
	remote education	spatial planning	rural tourism
	public transport	environmental quality monitoring	co-sharing of equipment
	e-care e-health	online meetings and consultations with residents	rural incubators

Source: own work.

Should smart actions be carried out in all thematic areas at once? This might be difficult and may discourage taking any steps. At the beginning, it is best to choose

one or several minor solutions which, taking into account the area's advantages, will increase the chances of success. It is vital to identify both the residents' needs and available resources. In the opinion of the participants in the study, i.e. one of the initiators in Ryczywół: "courage and a vision to improve the situation in the small homeland is also important".

1.2. Reasons behind implementing the concept of smart villages

Currently rural areas are undergoing rapid change (Zawalińska, 2012; Halamska, Stanny, 2021; Stanny et al., 2021). The idea of smart villages is a response to the current problems of rural development stemming from ongoing demographic change, including mainly population ageing and an outflow of young people from rural areas, low population density, fewer and fewer jobs, an insufficient and decreasing range of services provided in these areas or a lack of funds for investment. In this context, the threat of the so-called "circle of rural decline" is mentioned (Figure 1.2), where each of the elements indicated may be both a driver for and an effect of unfavourable changes taking place in rural areas.

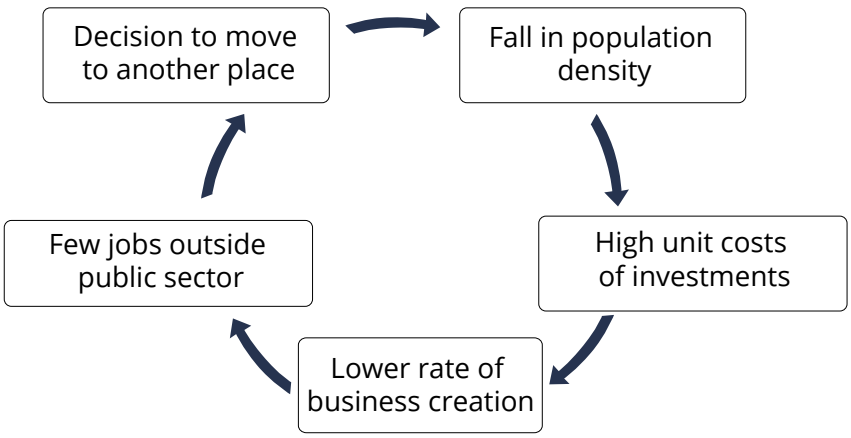

Figure 1.2. Diagram of the "circle of rural decline"
Source: own work based on ENRD (2018a).

Rural areas must address these problems comprehensively (this is a challenge not even for the coming years, but actually for the next months and weeks), given that they are often combined with the need to use modern digital technologies (some people without sufficient digital and technological competences may be permanently deprived of the possibility to satisfy their needs and furthermore – some of them may be permanently socially excluded). Therefore, the identification of the reasons behind

the implementation of the smart village concept is a starting point for the creation of such solutions that would, on one the hand, enhance the quality of life in rural areas but, on the other, prevent deprivation of needs of a large part of society. The ENRD Thematic Group on Smart Villages points to five drivers of smart solutions in rural areas:

1. responding to depopulation and demographic change;
2. finding local solutions to public funding cuts and the centralisation of public services;
3. exploiting linkages with small towns and cities;
4. maximising the role of rural areas in the transition to a low-carbon, circular economy;
5. promoting the digital transformation of rural areas (ENRD, 2018a).

The demographic change currently taking place is one of the key reasons behind the necessity to introduce smart solutions in rural areas and setting the rural development trend all across Europe. Demographic change is universal, i.e. observable in each territorial unit, but its impact and intensity depends on the geographical location (ESPON, 2017). On the one hand, the ongoing demographic change (low fertility, high mortality, migration of people to cities, outflow of better educated youth to cities) carries a huge risk, because the decline in the population that generates the GDP and a simultaneous increase in the number of the so-called benefit recipients is an economic and social challenge for those in power. Due to the change in the size and structure of population in the modern world, national economies face the challenge of the rational inclusion of this phenomenon in demographic and economic policy (Mączyńska, 2010; Kotowska, Jóźwiak, 2012). However, demographic change may have a positive impact on measures aimed at reorganisation in rural areas.

Depending on migration trends, two types of areas can be distinguished: 1) **those with a declining population**, where within the last several years the recorded population outflow has been bigger than its inflow; 2) **those with a growing population**, where – contrary to the first point – the observed inflow has been bigger than the outflow. In each European Union member state there are population inflow (concentration) zones, usually located around urban centres of different rank. The model example of such population distribution is France (ESPON, 2017). Rural areas with predominant population outflow are located, in particular, in the countries of eastern and central as well as southern Europe, in the Nordic countries and the Iberian Peninsula and they cover peripheral areas (far away from agglomerations) in regional systems.

In Poland the areas with declining population and those with a predominant outflow of inhabitants make up approximately half of all rural and urban-rural municipalities. However, the spatial distribution is not uniform – the population concentration zones are generally limited to the suburban areas of provincial (voivodship) capitals, subregional cities and some towns of local importance (Czarnecki,

2019). Apart from that, in provinces such as Wielkopolskie, Pomorskie, Małopolskie, an increase in the number of residents is recorded in the majority of the municipalities. In many provinces (outside the metropolitan areas), a steady outflow of rural residents is observed – this process is most intense in eastern and central provinces (Mazowieckie, Lubelskie, Podlaskie, Świętokrzyskie), as well as in almost the entire Opolskie province and in the central part of Zachodniopomorskie (Figure 1.3).

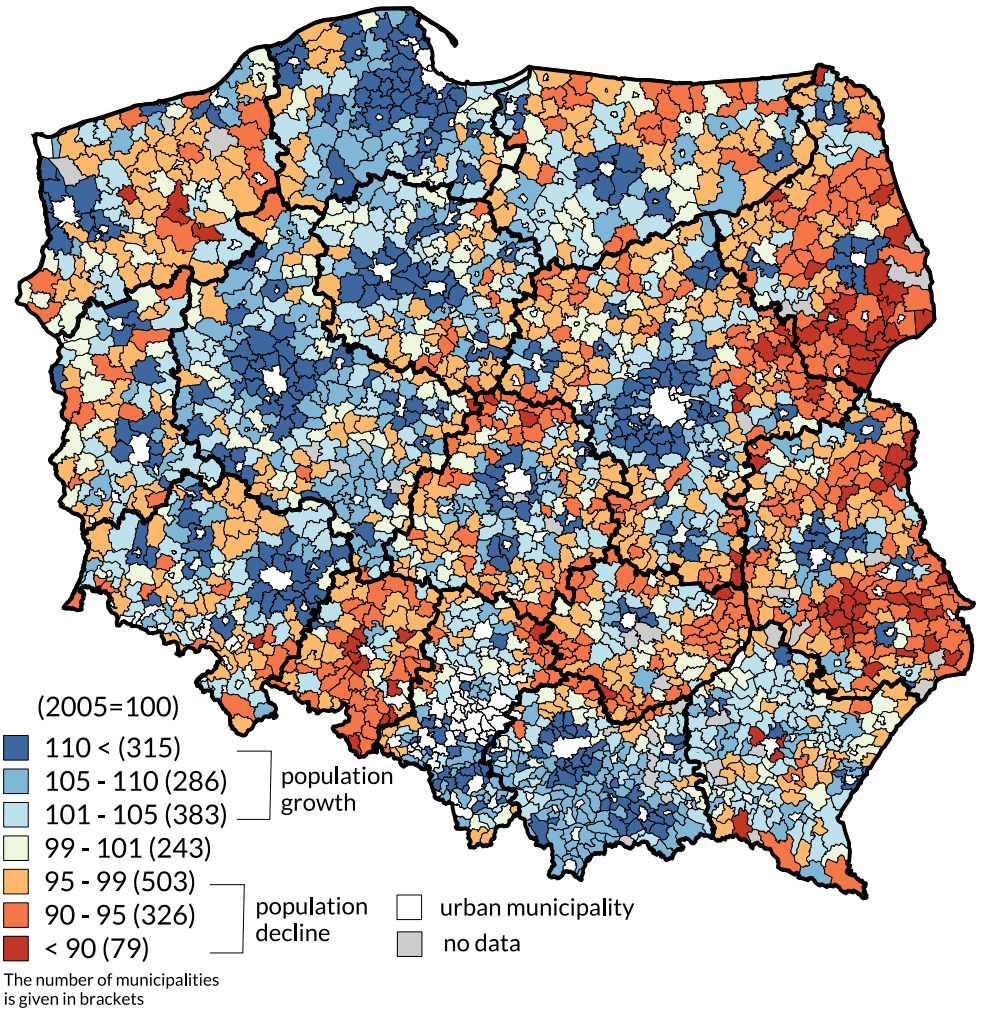

Figure 1.3. Change in the number of residents in rural and urban-rural municipalities in Poland in 2005-2019
Source: own work based on BDL GUS (Local Data Bank, Statistics Poland) data.

The changes in the number of residents coincide with the changes in the age structure of the population. As young people migrate more often than other groups and women more often than men (Rosner, 2016), the depopulating areas are characterised most often by an unfavourable demographic structure with an overrepresentation of population at post-working age. In turn, areas of population concentration are demographically the youngest (Stanny, Strzelecki, 2020).

A demographic process that has been taking place (in different phases) for many years in all European countries is population ageing (Eurostat, 2019). According to the Eurostat data, in the coming years the percentage of elderly people in European Union countries will increase and the share of people aged over 65 in the total population will be more than 28% by 2050 (in 2008 it was 17%). Currently, the demographically oldest communities live in the countries of western and northern Europe. Against this background, Poland may still be considered a relatively young country, although

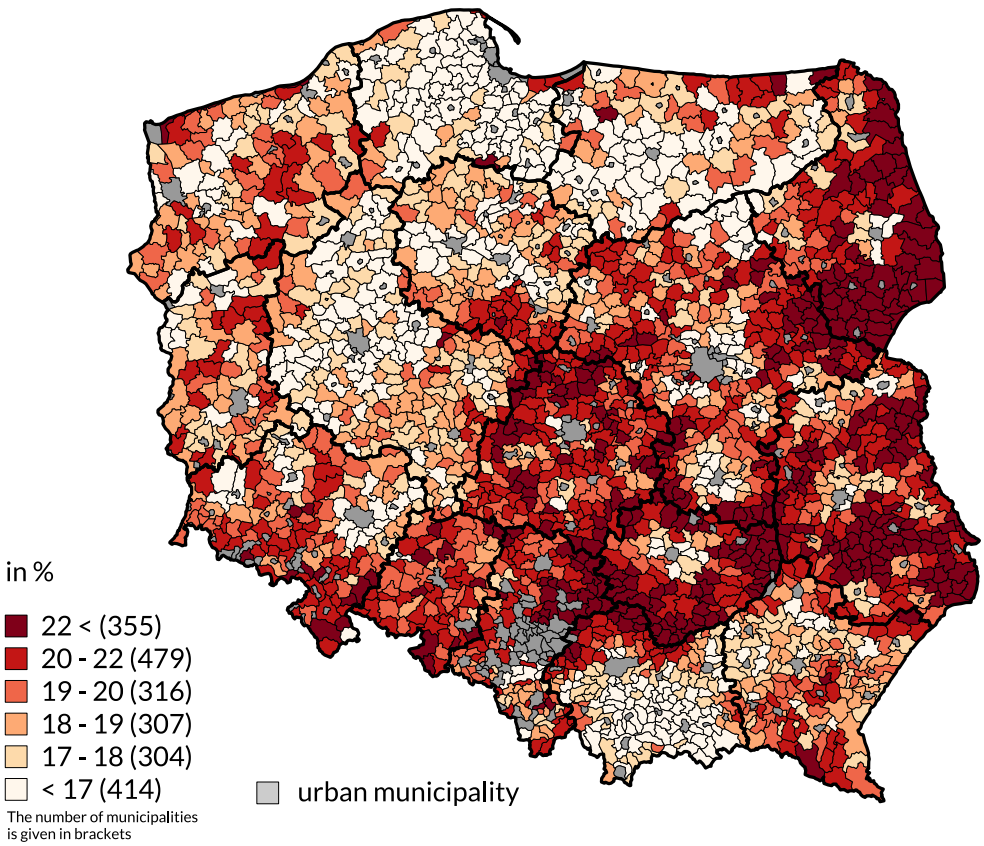

Figure 1.4. Percentage of people at post-working age (over 60 for women and 65 for men) in municipalities in Poland in 2019
Source: own work based on BDL GUS data.

intraregional variations may also be identified in this respect. Podlaskie, Świętokrzyskie and Łódzkie, among others, have the largest percentage of elderly people. This is the case, in particular, around the administrative borders of these provinces (Figure 1.4). Villages located close to cities as well as most municipalities in Pomorskie, Wielkopolskie, Małopolskie and Podkarpackie can be considered the youngest. Every fifth rural resident is a person at post-working age (over 60 for women and 65 for men), and the process of rural population aging will be deepening in the coming years most rapidly in the areas that currently have the most favourable age structure of the population (Frenkel et al., 2019).

According to the demographic forecast for 2014-2050, Poland's population will decline steadily (from 38.4 million in 2013 to 33.9 million in 2050), and the number of people aged 65 and more in Poland may increase from 5.67 million to 11.09 million (from 14.7% to 32.7% of the total population (GUS, 2014).

Rural depopulation, the flight of young people to cities or more gentrified areas and, as a result, rural population ageing, are considered to be a symptom of rural degradation. These are the key reasons for the need to introduce solutions that would increase the resilience of rural communities. Creating smart solutions can increase the vitality of these areas. It is also very important to find local solutions that – especially when public spending is cut – will address the problems that make life in rural areas difficult (cf. Śpiewak, 2009). This mainly pertains to such services as health care, education, commerce or public transport, which are limited in rural areas if public services are centralised. This makes it clear that the strategic goal of the authorities should be to build and make use of existing relationships and to shape the linkages between villages and small towns and cities. An important point indicated by ENRD (2018) is also to increase the role of rural areas in the transition to a low-carbon, circular economy. This economy is a system designed in such a way so as to regenerate itself. Climate change is taking place, whereas natural resources are limited and it is very often these resources that form the basis of the competitive advantage and have impact on the attractiveness of rural areas.

The last of the mentioned reasons for creating smart areas is support for the digital transformation in rural areas. It should be stressed that rural areas have been going through the process of global technological development in recent years. The adaptation to these transformations is a necessity as more and more activities are carried out in the virtual world. The observed changes that have occurred in people's daily lives since the outbreak of the SARS-CoV-2 coronavirus pandemic have made this challenge tougher. By definition, information and communication technologies make it possible to reduce distance (in the geographical sense), thereby increasing access to public goods and services. In this context, they are treated as an opportunity to overcome development-related difficulties. Their usefulness is, however, dependent on access to the internet. Its lack or poor accessibility deprives a given area of opportunities for smart development.

Since the beginning of the 21st century, dynamic processes such as, first, computerisation and the development of mobile telephony, and then the development of the internet and dependent services, have been taking place in Polish rural areas. All elements connected with these processes are often called smart development or intelligent development (Janc et al., 2019). In the era of information society development, depriving one of access to the network is almost equivalent to depriving of opportunities for creative development.

In 2019, 85% of rural households in Poland had access to the internet, mostly through broadband. In cities this rate was higher by 3 percentage points, while in 2005 access to the internet in cities was twice that in villages (36% versus 19%) (GUS, 2019) (Figure 1.5.). Therefore, the conclusion that ICT facilities have become more evenly distributed in rural and urban areas is justified. However, the internet infrastructure is not evenly developed across Poland, and the existing inter- and intra-regional differences co-exist in line with varying levels of socio-economic development of rural areas. The higher the underlying development capital of a given territorial unit, the better access to the internet in its area. Likewise, this access becomes worse in local units at a relatively lower development level (Komorowski, Stanny, 2020). COVID-19 has shown the importance of internet access and the quality of digital and communication infrastructure in the country. Insufficient quality of internet connections is becoming the main factor of social exclusion – not only does it make it difficult to satisfy educational or cultural needs, but it also deprives people of the possibility to

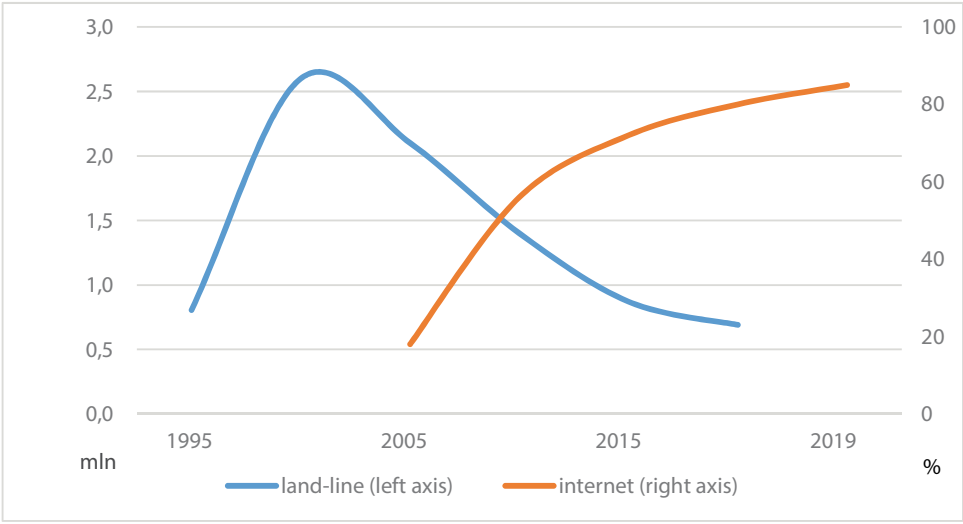

Figure 1.5. The number of land-line subscribers (left axis) and the percentage of rural households with access to the internet (right axis) in 1995-2018 (in rural areas in Poland)
Source: own work based on BDL GUS data and GUS, 2017, GUS, 2020a.

work (Kalinowski, Wyduba, 2020). What can be done to increase the share of households with access to broadband connection? The USA and China are already planning to build networks of several thousand satellites to enable access to the internet from any place on Earth (Voelsen, 2021).

Rural areas still require significant investments in ICT infrastructure as demonstrated, inter alia, by the amount of funds allocated for digitalisation of rural areas under the Operational Programme Digital Poland 2014-2020. By February 2020, agreements were signed for the implementation of tasks worth approximately PLN 13 billion[1] (Figure 1.6). The investments made are aimed not only at connecting a given area to the internet, but also (or especially) at ensuring access to good quality, stable and relatively fast internet. At the end of 2019 land-line internet with a capacity of at least 30 Mbps was provided to 30% of buildings in rural municipalities, to 43% in urban-rural municipalities, and to 62% in urban municipalities (Office of Electronic Communications (UKE), 2019). The Office of Electronic Communications predicts that when the disbursement of funds

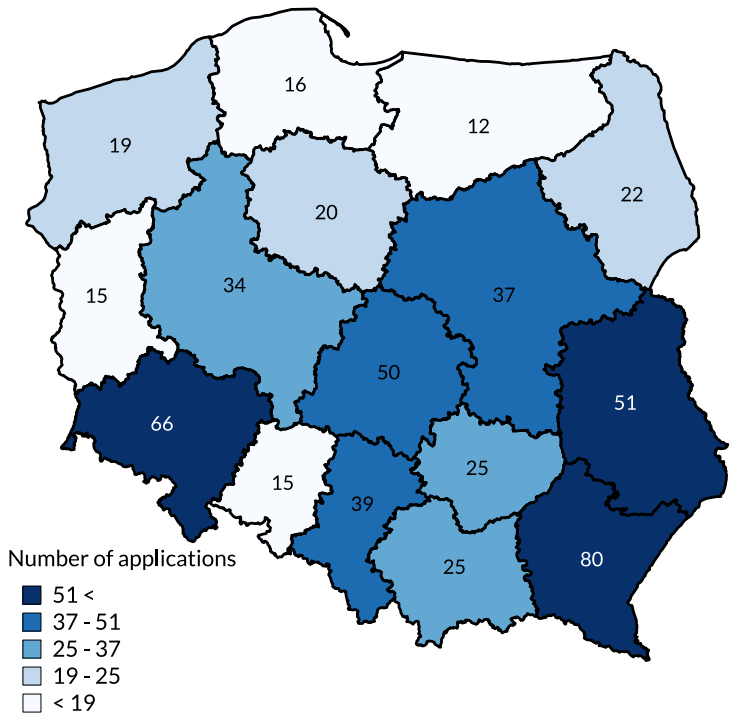

Figure 1.6. The number of applications for co-funding projects related to common access to fast internet under the Operational Programme Digital Poland 2014-2020 in provinces (as of 30 June 2020)
Source: own work based on BDL GUS data.

[1] In 2021, PLN 1. – was on average worth EUR 0.22.

from the Operational Programme Digital Poland 2014-2020 is over, the value of the aforementioned indicator will double for rural municipalities (ibid.).

Access to good quality internet is a problem that rural communities often try to solve by contacting local authorities. Data from the project "Rural Development Monitoring" (Stanny, Rosner, Komorowski, 2018) shows that the topic of access to the internet is raised at two out of three village meetings and briefings with heads of villages. It is raised more often in the areas where access to the internet is worse compared to other villages. COVID-19 has made people aware of the problem of digital exclusion, especially as a significant part of activity has moved online. In this situation, people living in areas with poorer access to the internet have been exposed to marginalisation and, as a result, have been deprived of the opportunities of satisfying some of their needs.

However, having ICT infrastructure is not everything. It is extremely important to take action to improve the digital skills and competences of the population. In Poland, in 2020, 81% of people aged 16-74 used the internet regularly, but the older the age group, the lower the percentage (99% of 16-24-year-olds and 40% of 65-74-year-olds used the internet) (GUS, 2020). A similar conclusion has been reached in the "Social Diagnosis 2015" – rural residents use the internet less frequently than urban dwellers and at the same time they stop using it after reaching retirement age more often than other socio-professional groups (Batorski, 2015).

It should be highlighted that among people who do not use the internet on a daily basis about two thirds do not find it necessary to use this medium, a little more than half of them claim that they lack the skills and about 15% feel a general dislike for this tool. Technical barriers (i.e. too high costs of access or equipment) were mentioned by every fifth respondent (Figure 1.7). Thus it is not the technical barrier, but the competence or awareness barrier that is the current challenge to smart development (GUS, 2019).

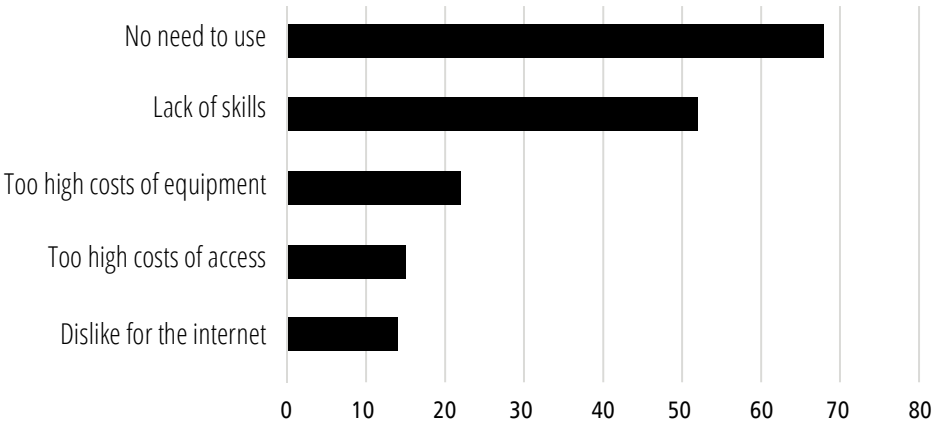

Figure 1.7. Causes (%) given for the household's lack of access to the internet in 2019 (rural and urban areas taken together)
Source: own work based on GUS 2019.

In the light of the above information, digital transformation appears to be necessary if we think about reducing the problems of rural areas. According to van Gevelt and Holmes (2015), technological progress effectively integrated into rural development initiatives can create new opportunities to increase income and provide services that enhance the quality of life in rural areas. The introduction of facilities in these areas is of particular significance for attracting and retaining the so-called creative class, which contributes to the development of rural communities (McGranahan et al., 2011). While analysing the reasons behind implementing the smart village concept, the specific characteristics of a particular rural area and its spatial location should be borne in mind. Rural areas vary in terms of distance from, as well as dependence on external markets or natural resources (OECD 2018). Therefore, **it is necessary to individually look for opportunities for undertaking such initiatives that, by using local resources, make a given area attractive to both residents and potential investors**.

1.3. Implementation of the concept in European Union policy

The growing importance of the smart village concept in the EU caused the European Commission to launch the "EU Action for Smart Villages"[2]. Although the concept is commonly perceived as part of the Common Agricultural Policy (CAP) responsibilities, it covers not only the activities of the Commissioner for Agriculture and Rural Development, but also those of the Commissioners for Regional Policy as well as Mobility and Transport. The increasing popularity of smart villages may also be demonstrated by the fact that – in addition to EU institutions – national governments, local governments and various stakeholders in rural areas became interested in the concept. Support was also expressed by the European Parliament, the Committee of the Regions and the European Economic and Social Committee (ENRD, 2018).

[2] The chronology of the development of the smart village concept was presented by Ana Martinez Juan and James McEldowney (2021) who pointed to the following path:

– 2014 – EU rural development programmes (2014-2020).

– 2016 – Cork 2.0 Declaration; ESPON Cooperation Programme 2020.

– 2017 – UE Action for Smart Villages; ENRD: thematic working group/portal on smart villages; Venhorst Declaration; Communication on the future of food and farming.

– 2018n – Bled Declaration; Añora Declaration; legislative proposals on the CAP (COM(2018) 392).

– 2019 – Final report: smart eco-social villages; Declaration on cooperation for a smart and sustainable digital future for European agriculture and rural areas; Launch of the "Smart Rural 21" project (DG AGRI).

– 2020 – European Green Deal: Farm-to-Fork Strategy / Biodiversity Strategy; Roadmap: Long-term Vision for Rural Areas; Recommendations from the European Commission to the Member States on their strategic plans for the CAP.

The importance of the concept was underlined in the "Bled Declaration" of April 2018. The Declaration confirms that the rural digital economy, if developed in an innovative, integrated and inclusive way, has the potential to enhance the quality of life of rural citizens and, thereby, contribute to tackling the current depopulation of, and migration from, rural areas (European Commission, 2018).

The European Rural Parliament's "Candás Declaration" (*The European Rural Parliament Manifesto 2019*) highlights the need to support smart initiatives within EU policies (European Rural Parliament, 2019a, 2019b). The development in this direction is also recommended by the Organisation for Economic Cooperation and Development in its principles on rural policy (OECD, 2019). The importance of digital technologies is also pointed out by Franc Bogovic and Tibor Szanyi (ENRD, 2018), who see an opportunity to ensure an easier and better life for rural residents in the development and practical application of this concept, adding that it is a necessary response to the challenges posed by population ageing and the disappearance of services.

It should be emphasised that an important document influencing the smart development of rural areas is the Rural Development Programme (RDP) 2014-2020. It refers to rural development that takes into account contemporary environmental, economic and social challenges (Zavratnik et al., 2018). The LEADER/CLLD approach has been adopted within the framework of European policies: it defines the way to mobilise and deliver rural development by making use of local ideas and looking for new ways to achieve competitiveness. It aims at finding and testing solutions exploiting local resources and mobilising local communities. The key characteristics of the LEADER approach are as follows: local development strategies for the territory, bottom-up strategy formulation and implementation, local public-private partnerships (LAGs), integrated and multi-sectoral actions, innovation, cooperation, networking.

Programmes designed in the framework of rural development policies address at least four EU priorities for rural areas, aimed at supporting, strengthening and promoting innovative and knowledge-based methods of social farming, forestry, food production, agricultural ecosystems and the efficient management of resources or rural development (Nurzyńska, Drygas, 2018).

The importance of the smart village concept is confirmed by the fact that a dozen or so meetings of the Thematic Group on Smart Villages of the European Network for Rural Development were held between 2017 and 2020. At the same time, the groups set up by ministries for rural development in particular member states are working on programming support for smart villages. Research and development projects as well as pilot projects are being implemented, e.g. the pan-European "Smart Rural 21", "SIMRA", "In-depth study of smart villages in Poland".

In 2019, an international workshop entitled "Smart Villages as an Effective Way to Address Key Challenges in Rural Areas" was held in Poland. It was organised by the Polish Rural Network (KSOW) and the Polish Rural Forum (FAOW). The workshop

Table 1.2. Recommendations for implementing smart solutions in rural areas in Poland

Build on experience
It is necessary to rely on the existing forms of cooperation, often very fruitful for many years, for example related to village renewal or the LEADER approach. The establishment of new structures and the bureaucratisation of this concept should be avoided. This also applies to any other cooperation, e.g. non-governmental organisations, producer groups, tourist industry, centres for social economy support.
Start from one village, but build partnership
Smart village projects must respond to the needs of local communities, even if they are small. However, if a particular problem or need is not limited to a single village, it is a good idea to look for a joint solution (e.g. in cooperation with several village associations or in consultation with the municipality/county).
Take into account of rural areas lagging behind digitally
Although the term smart villages, as opposed to smart city, does not mean relying on modern technologies only, good access to (fast and stable) internet for rural residents is crucial for local development. People's competences in this field are also important.
Appreciate people's actions
A smart village approach should not be planned without the participation of local government leaders, NGOs and other stakeholders. Existing resources, e.g. active village leaders and other local leaders, should be used.
Reward activity
In order to promote the concept of smart villages, it is worthwhile to show rural communities the potential benefits of its implementation, e.g. by using the already identified examples of smart solutions. Moreover, the most active rural communities should be appreciated (e.g. by promoting the solutions applied by them).
Smart villages may help small farm holdings
The smart village concept may be developed in particular in agriculture, which is increasingly using new advanced technologies. This, combined with stimulating cooperation between farmers, offers an opportunity for the development of this sector of the economy, even in those areas where agriculture is fragmented and seemingly in decline.
Include the advisory sector in supporting smart actions
New technologies should be used to develop advisory services, which should ultimately become innovation brokers.

Source: own work based on the workshop "Smart Villages as an Effective Way to Address Key Challenges in Rural Areas".

was held in connection with the *My SMART Village* competition organised by the Institute of Rural and Agricultural Development of the Polish Academy of Sciences. During the workshop, representatives of nine European countries, the European Commission, the European Network for Rural Development (ENRD), the European LEADER Association for Rural Development (ELARD) and the Smart Village Network adopted seven strategic recommendations (Table 1.2.). These recommendations can be an important voice in the development of smart villages. They form the basis for increasing mobility, developing rural business, taking advantage of opportunities in the bioeconomy and the circular economy, improving the quality of education and health services, or preventing social exclusion.

It is not known yet how exactly the smart village instrument will be planned in the coming years because at the time of writing this book work is still ongoing on the Strategic CAP Plan which would be the main source of this concept. However, the plan is to be based on some universal and general principles behind the reasons for the development of the concept to date as well as the obligations of the member states to the European Union (Polish Ministry of Agriculture and Rural Development (MARD), 2020):

- the intervention will be targeted at the environment and an element of digitalisation will be required,
- innovations will be the basis for the creation of smart villages, but their nature is to depend on the specific features the area,
- support will be provided on a micro scale (even at the sołectwo level),
- implementation will take place on the basis of the concept (strategy, plan) for a village (or another territorial unit), whereas the funding of the concept will be possible from various sources (also other than CAP),
- a significant role in implementing smart villages will have Local Action Groups (LAGs) which, through the updated local development strategies (LDS), will be able to determine the scope and nature of support.

The idea of the smart village instrument in Poland is that it will be divided into two phases (MARD, 2021). It means that during the first phase local communities will define how they want to implement the smart village principles (by developing concepts covering one village, a group of villages or another territorial unit). This type of approach may not only enable them to apply for funds for the implementation of the initiatives planned under the concept, but also (and perhaps most importantly) it will bring together the residents that are covered by the plan to jointly define a vision of development, to diagnose their social, economic and environmental situation. It will also enable the mobilisation of local resources to implement the concept (Figure 1.8).

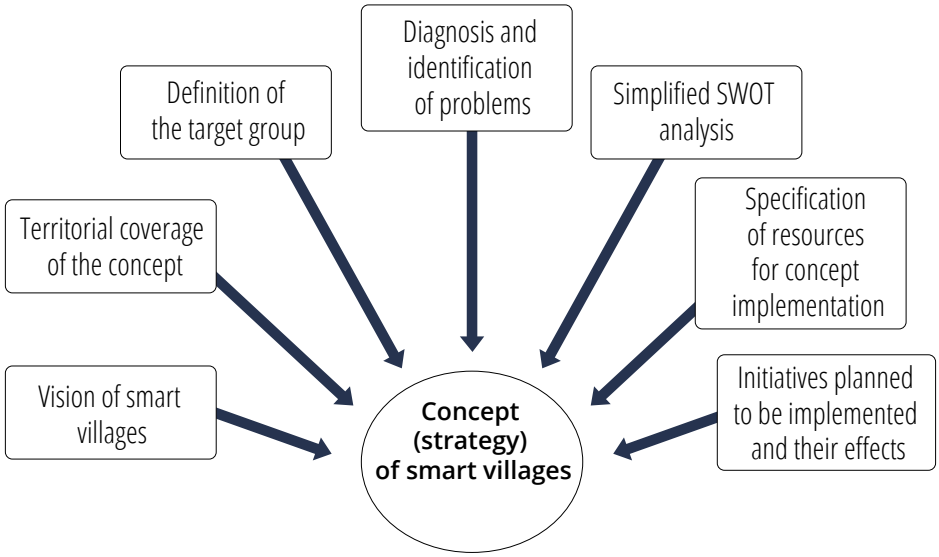

Figure 1.8. Components of the concept (strategy) of smart villages
Source: own work.

The notion of smart villages appears in an increasing number of EU and national documents, which implies that it will be an important instrument of the future EU financial perspective 2023-2027. The fact that two paths of smart initiatives are beginning to appear in Europe requires comment. One of the paths is described in the framework of case studies in this publication and can be regarded as "unofficial". Based on it, the guidelines for the "official" path are being designed, the mainstream of which will be reflected (to a greater or lesser extent) in the CAP Strategic Plans of particular EU member states (European Commission, 2021). Different "places" with different socio-economic and geographical characteristics will be the beneficiaries of smart solutions. An opportunity is being created for a new dimension of place-based policy, i.e. "a long-term strategy aimed at tackling persistent under-utilisation 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).

1.4. Challenges of enhancing the quality of life faced by smart villages

The implementation of the smart village concept is of great significance for enhancing the quality of life in rural areas. Although, due to its interdisciplinary nature, the very notion of quality of life is difficult to define, an intuitive understanding thereof has been noticeable in the studies on the socio-economic situation of the rural

population for a long time (cf. Murawska, 2012; Gotowska, Jakubczak, 2012; Kud, Woźniak 2013; Kalinowski 2015; Woźniak, 2015; Michalska-Żyła, 2016; Dej, Zajda, 2016; Kałuża et al., 2017; Chmielewska, Zegar, 2018, Leszczyński, 2020; Kalinowski, Rosa, 2021). Despite the existence of numerous definitions, one commonly used has not been developed yet. When considering the quality of life, approaches from the purely subjective to the quasi-objective intertwine. In some studies, these dimensions interpenetrate one another, e.g. Sheila M. Peace's (1990) definition refers to the degree of satisfaction of material and non-material needs of individuals and social groups, specified by both objective and subjective indicators. Helena Sęk (1993), in turn, has assumed that the quality of life in the objective dimension is "the conditions of human life, objective attributes of the natural world, objects and culture, and objectively assessed human attributes related to the standard of living and social position", while in the subjective dimension it is "the internal processes of valuing various spheres of life and life as a whole". However, the studies distinguish much more often between two categories – a subjective quality of life and objective standard of living. A search of the literature shows that the standard of living is defined by reflecting the reality and the current situation of individuals, while the quality of life is a concept pointing out to satisfaction with reality.

A subjective approach to the quality of life makes it possible to define it as a set of feelings of an individual depending on economic variables (income, possession of goods, prices, forms and quality of supply), intervention variables (habits, attitudes, expectations, social patterns, opinions), demographic characteristics, education and time (Hodoly, 1973). Although each of these aspects has both subjective and objective dimensions, their assessment is primarily based on the system of values and feelings resulting from the degree of fulfilling needs and aspirations. It can be assumed that the quality of life is a state of satisfaction, happiness, contentment with the overall existence (enjoyment of the natural environment, good health, prosperity in life, social position, well-being and consumption), which implies a subjective understanding. By combining the above aspects, Jan Rutkowski (1987, 1988) defined quality of life as a set of needs, the satisfaction of which makes people happy.

According to Czesław Bywalec and Leszek Rudnicki's (1999) definition, which is as broad as that provided by Andrzej Hodoly, quality of life is described as "a state of satisfaction, happiness, contentment with the overall existence, i.e. enjoyment of the natural environment, good health, prosperity in life, social position, well-being and consumption". Quality of life thus understood can be identified with the concept of sustainable development (cf. Kłodziński, 1997; Borys, 2002; Borys, 2008; Guth, Smędzik-Ambmroży, 2017; Kalinowski, 2018; Wieliczko et al., 2021), which is a result of a comprehensive combination of different elements of the satisfaction of people's needs. Barbara Chmielewska and Józef Stanisław Zegar (2018) also mention the degree of satisfying material and immaterial (also referred to as spiritual) needs and meeting standards or realising biological, psychological, spiritual, social, political, cultural,

economic and ecological values of individuals, families and communities. Krzysztof Kud and Marian Woźniak (2013) specify in detail the most important factors such as the housing situation, employment security, health and life protection, opportunities for learning and upskilling, access to culture or commercial establishments, the state of technical infrastructure, the degree of individual need satisfaction. Therefore, it can be assumed that the determinants of the quality of life are the elements of socio-material life complemented by the experiences and aspirations of the individual.

It should be underlined that the implementation of the smart village concept does not require simultaneous measures in all the areas indicated. At the same time, it is worth asking a question whether every enhancement of the quality of life is synonymous with creating conditions for smart areas. Following Boyd Cohen (2011), who included the quality of life into one of the six dimensions that make up the smart city concept (cf. Sikora-Fernandez 2013; Zysińska et al. 2014), it can be concluded that this component is also extremely important in rural areas. It can be assumed that the aim of smart solutions is to create optimum living conditions for rural residents, ensuring them access to public services in the field of healthcare, safety, cultural life, sports and recreation. The improvement of the quality of the services provided is particularly important because of their lower availability in rural areas as compared to cities. Therefore, studies on smart villages promote social solutions which improve the possibility of making use of these services. It is debatable whether these solutions should have a digital dimension and whether they should exploit modern technologies, including information and communication technologies.

Deliberations on smart villages' challenges of enhancing the quality of life and the relationship between these categories require answers to several questions. First, should the concept of smart villages be viewed from the perspective of individuals or society as a whole? Does a village become smart when all its residents, or only some of them benefit from the results of its development, or maybe is it enough if it is just one person? It seems that being a smart village requires that a significant part of the local community should enjoy the benefits of development. Therefore, the condition for being smart is to create such linkages and micro-structures which, through joint actions, will strive to create new values in the local dimension. These new values also include increased local activity, cultural and social ties as well as networking links.

When making use of Erik Allardt's (1993) concept of need satisfaction, another question must be answered. Which of the three dimensions of need satisfaction (the need *to have*, the need *to love*, the need *to be*) and to what extent constitutes being smart? If need satisfaction is necessary to enhance the quality of life, then, in the first place, it is indispensable to identify those needs, the satisfaction of which contributes to the common good. Does mere possession contribute to enhancing the quality of life of all? If we understand possession broadly as economic resources, housing, employment, working conditions or the ability to satisfy educational needs, and if we consider that it is not only the quantitative but also the qualitative dimension which

is significant, then another question arises. Does the limited possibility of delivering them in rural areas rule out being smart? However, if this notion is expanded to include not only *having*, but also opportunities for utilisation of and equal access to some goods and resources, then this dimension of enhancing the quality of life becomes fuller. Also the *loving* component should be expanded by complementing it by attachments and contacts in the local community, interpersonal relations or neighbourhood ties, which *de facto* determines the possibilities of cooperation for the common good, hence the third component – *to be*. This component comprises the possibility of improvement, personal safety, but also activity in various fields and the quality of leisure time, which is usually limited in rural areas. Allardt's approach to need satisfaction, thus understood, becomes fuller for the explanation of the smart village concept and the resulting enhancement of the quality of life.

Due to limited financial possibilities, it is difficult to talk about any *sine qua non* conditions for being a smart village and therefore sufficient conditions are sought. It can be assumed that enhancement of the quality of life in rural areas is important in each field where the residents expect it. However, comprehensive delivery is not possible in many cases. Therefore, it seems that introducing changes on a micro scale, frequently at the level of small investments that do not require a lot of funds or require only people's own work (for the villages still underinvested), may be an opportunity to implement smart solutions and improve well-being. While in cities local budgets can afford capital-intensive solutions, in rural areas these are usually beyond the reach of the local authorities.

As can be seen, universal operationalisation of the concept of smart villages and linking it to quality of life is extremely difficult due to the diversity of characteristics that determine both being smart and enhancing the well-being of rural residents. They may be considered to involve solutions including material, social and agri-environmental well-being, combined with smart innovations and increased activity for local communities. Smart solutions and innovations that enhance quality of life must serve social inclusion and the creation of a knowledge-based society, while also mobilising the resources that villages have. According to Magdalena Zwolińska-Ligaj et al. (2018), This concept must be conditioned by a set of economic, social and spatial factors unique to a given area, which determine the diversity of this process paths. Thus, there is no single model of creative regional development, and its nature is determined by local conditions.

It may be assumed that the aim of smart solutions is a development of local communities that it makes them more sustainable and resilient. Enhancement of the quality of life in rural areas through smart development should encourage young people to remain in these areas, thereby reducing the problem of "brain drain". It should also contribute to an increase in migration of the urban population to villages. However, this does not only mean migration to areas around large agglomerations or strongly gentrified areas, but also to peripheral villages, and then – giving an impulse

for their development. In this context, the smart village concept is intended to prevent depopulation and ageing of Polish rural areas. Rixt A. Bijker et al. (2012) point out that in popular discourse the village is most often identified with a sense of rural idyll, a desire for peace and quiet away from the hustle and bustle of the city, willingness to live more freely, close to nature. It is rarely associated with smart solutions aimed at enhancing the quality of life. It is, therefore, necessary to take measures that will trigger active initiatives to enhance quality of life in rural areas and will create their image as a place that is good for both work and life.

In conclusion, it may be stated that the challenge for contemporary rural areas is development that focuses on local needs, enhances the quality of life through better access to (social, technical and transport) services and infrastructure, as well as creates more resilient social structures, using available and adequate tools (including communication and digital ones). While programming such development, appropriate agri-environmental, technological and social solutions should be identified so as to draw on local resources to the maximum.

1.5 Smart city versus smart villages

The concept of smart villages appeared in the rural development policy of the European Union as an analogy to the smart city concept, in view of the need to achieve the objectives of the Europe 2020 Strategy. The main priority of this strategy was sustainable, smart and inclusive growth. A smart city in the literature is also referred to as a digital city, creative city, intelligent city, information city, knowledge city or learning city (Gil-Garcia et al., 2015).

The term smart city was used for the first time in the 1990s. In the beginning the concept was primarily focused on investments in technology and infrastructure to be used for smart solutions. Due to environmental pressure and challenges such as technological progress and the knowledge-based economy, the smart city concept has evolved over time (Rosa, Jakubowska, 2011). This view was shared by the commissioners of the European Commission (EC) in whose opinion advanced social and environmental progress should take place in cities, but only while simultaneously upholding economic attractiveness and growth based on an integrated approach (taking into account all aspects of sustainable growth) (European Commission, 2011). Andrea Caragliu et al. (2011) consider a smart city to be a place where investments in human and social capital and (traditional, modern) infrastructure are the basis for sustainable economic growth and a high quality of life, with a simultaneous wise use of natural resources and civic participation. A smart city is well-organised, computerised, rational, progressive, internationally competitive, attractive, modern and friendly for residents (Fazlagić, 2015). It operates on the basis of "a development strategy that focuses on creativity, openness to innovation and flexibility (...) is based on the application of information and communications technologies (...) with a view

to improving the standard of living of the residents and increasing their participation in making important decisions". Among others, the following determinants of smart city development are mentioned: innovation of particular factors, creativity, entrepreneurship, quality of life, quality of human and social capital (Rogerson, 1999; Florida, 2005; Szczech-Pietkiewicz, 2015; Capello, 2016). When the term smart city started to be used, in the beginning its main focus was information technology only. By analysing smart city models, Taewoo Nam and Theresa A. Pardo (2011) found that the social elements associated with technologies used to transform the economy, environment and community are always present. Patrizia Lombardi et al. (2012) extended this approach by including into the smart city model six areas ensuring enhancement of quality of life and sustainable development: economy, mobility, environment, people, living conditions, co-governance (Figure 1.9.).

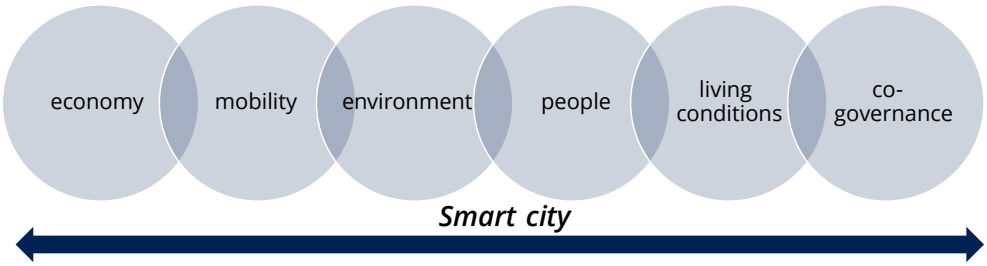

Figure 1.9. Areas of smart city delivery
Source: own work on the basis of the *Smart Cities Ranking of European Medium-sized Cities 2007*.

The analysis of the smart village concept shows that it is seemingly very close to the smart city idea; some even call it its 'rural' version. Is this really the case? Undoubtedly, the smart village concept, which in a certain aspect is formulated as an analogy to the smart city, emphasises that effectively integrated technological progress in rural areas (together with the development initiatives undertaken) may enhance the quality of life in villages. However, it should be borne in mind that communities living in rural areas grapple with different problems compared to those in urban areas, and at the same time they have more limited access to new information technologies. What distinguishes smart villages from smart cities is social innovation, which may become a driving force for change in rural areas. Focussing on the development of human and social capital may contribute to more effective implementation of technological innovation in these areas (Krievina et al.; 2015; Zwolińska-Ligaj et al., 2018).

Table 1.3. Comparison of major characteristics of the *smart city* and *smart village* concepts

Smart city	*Smart villages*
Initiated in 1990s.	In the conceptual phase for 3-4 years.
It is to be a response to technological change, innovation and environmental pressure	It is to be a response to demographic problems, the deterioration of public services and low social activity
Objective: increasing the competitiveness of the territory, increasing the effectiveness of the use of resources, enhancing the quality of live	Objective: improving living conditions, retaining residents, digitalisation, developing social capital
The key driver is access to technology and human capital	The key is social capital, local heritage, promotion of digital and social innovations
A very important role of private entities and city authorities (public-private partnerships)	Great importance of local leaders, NGOs and local authorities (mobilisation and coordination)
Major barriers to implementation: technological, organisational, financial as well as lack of residents' awareness, acceptance and co-participation	

Source: own work.

Comparing the smart city concept with that of smart villages, it can be observed that some conditions are common to these concepts, e.g. environmental protection, while some are different – above all demographic phenomena (depopulation problems). Moreover, the smart village concept, which serves to implement the Europe 2020 strategy and the Cork 2.0 Declaration, is still at the formulation stage, while the political support of institutions such as the UN, the EU and the OECD has enabled the rapid development of the smart city concept for many years.

The differences between the concepts arise also from slightly different needs of urban dwellers compared to those of rural residents (e.g. as regards transport, pace of life, expectations of need satisfaction). The local potential of villages and its best exploitation to build the local economy is of great significance for the model of smart rural development. This potential relates to social capital as well as economic, environmental or cultural capital (Bryden, Dawe, 1998). Among the sectors that may stimulate rural development are tourism, healthcare, recreational services, organic production, traditional food production, handicrafts or cultural services (Naldi et al., 2015). They can represent a market niche that, if certain local conditions exist, will affect the quality of life.

It should be emphasised that the implementation of these concepts in both urban and rural areas encounters barriers whose importance varies. In the case of smart villages, technological, organisational and financial barriers seem to be less essential, whereas mental barriers, i.e. lack of acceptance and identification with the smart

development concept, lack of residents' awareness and interest to participate, seem to be more serious.

Can we thus consider smart cities and smart villages separately? In the opinion of the authors, they should be considered simultaneously as there are many links between them and changes in cities influence rural areas and vice versa.

2. IN-DEPTH STUDY OF *smart villages* IN POLAND – THE CONCEPT OF THE FIELD STUDIES

2. In-depth study of smart villages in Poland – the concept of the field studies

2.1. Organisation and methodology of the field studies

To learn more about the selected initiatives aimed at smart villages, it was necessary to design in detail the concept of field studies. These studies were carried out in four phases: an initial phase and three research phases (Table 2.1.). During the initial phase, municipalities with social infrastructure and agri-environmental solutions that fit into the smart villages concept were identified. The selection of municipalities was based on earlier identification of the initiatives which were submitted to the *My SMART Village* competition, organised in 2019 by the Institute of Rural and Agricultural Development of the Polish Academy of Sciences (IRWiR PAN) in partnership with the Rural Development Foundation (FWW), the Union of Rural Municipalities of the Republic of Poland (ZGW RP) and RURBAN, and in cooperation with the Polish Rural Network. Subsequently, those that were the winners of the competition or whose solutions were in line with this monograph's assumptions were chosen. During the first phase key study issues were identified and IDI questionnaires were drawn up for three groups of respondents: initiators, beneficiaries and local authorities. It was decided that qualitative research would be the best research method, allowing for a detailed analysis of the initiatives, then a good understanding and specification of the mechanisms responsible for their successful implementation. Although the origins of this type of research go back to the times of Bronisław Malinowski[1], Florian Znaniecki[2] or Elton Mayo[3], it is still treated by economists as complementary to quantitative research, rarely constituting autonomous research. The choice of the qualitative method was based on the perception that an in-depth case study would better allow us to show the specific nature of the smart village concept. At the same time it was assumed that such studies would enable a thorough understanding of the reality and show the feelings of the initiators and beneficiaries of the initiative implemented.

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[1] Bronisław Kasper Malinowski (1884-1942) – an outstanding Polish social and economic anthropologist, traveller, ethnologist, researcher, author of functionalist theory. His research work involved a long-term stay with the community he was describing.

[2] Florian Znaniecki (1882-1958) – Polish philosopher and sociologist, the author of the biographical method in sociology. He thought that the researcher should look at reality through the eyes of its participants, adopting a subjective approach.

[3] Elton Mayo (1880-1949) – Australian psychologist and sociologist, researcher of working conditions. During his research he observed that employees' performance during an experiment is better when they know that they are participating in the experiment, while it decreases when the researcher is one of participants and the others do not know that they are participating in the experiment – the Hawthorne effect.

In addition, they would show the thoughts of the local authorities who covered part of the running costs. It was decided to carry out field studies in which (as Karolina Bielenin-Lenczowska (2011) notes) what matters for the recognition of phenomena taking place is the interaction with the interviewee and "(...) putting emphasis on dialogue with the interviewee, and not treating him/her only as a source of information; on observation and participation in the life of the community under study; as well as on reflection on the role of the researcher in this interaction (...)." Field studies were conducted in the second phase, using qualitative research techniques: IDI (Individual In-depth Interview)[4] and observation[5]. During the third phase the interviews conducted were recorded and then described.

The choice of field studies stemmed from the conviction based on the guidelines of the interpretive paradigm (Ahrens, 2008; Dobrołowicz, 2015), according to which, in order to understand certain events, it is necessary to study their occurrence in-depth. Hence, the authors decided – as part of the in-depth studies – to take a close look at 10 municipalities as well as to talk (face-to-face interviews) with initiators, beneficiaries and municipal authorities. The choice of such a method made it possible to reach socio-economically diverse units in which smart village projects had already been identified. The conclusions from the field studies were comparable for these units – individual in-depth interviews were conducted on the basis of the scenarios developed by the research team (see Sub-section 2.3.).

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[4] An individual in-depth interview (IDI) involves a conversation between the person conducting an interview (interviewer/moderator/researcher) and the respondent (interviewee/interlocutor) (Nicińska, 2000). This type of qualitative research allowed for a multi-faceted approach to the research topics, interviews with different types of respondents and an adequate number of interviews to draw conclusions. An in-depth interview allows for receipt of detailed information not only about the project itself, but also about its impact on the local community and on the attractiveness of particular areas. Magdalena Nicińska (2000) points out that "the main advantage of the technique described is that it is possible to learn fully about and understand the attitude of a particular person as an individual. The task of the interviewer is to get to the motives of the interviewee's behaviour, to understand the views and emotions related to the subject under study. The interviewer's focus on exclusively one person's experience is of significance for achieving this goal". Individual in-depth interviews were carried out as part of in-depth case studies in selected locations (cf. Noor, 2008) with the respondents recruited through the snowball sampling method (cf. Goodman, 1961).

[5] "Observation as a scientific method is a process of attentive and purposive perception that forms part of the methods of scientific investigation. It is also a peculiar collection, as well as interpretation, of the explored data in the process of their natural provision when they remain in the direct view and hearing of the observer" (Cybulska, 2013). In the case of this study, the interviewers conducted non-participatory observation, i.e. without being assigned a specific role in the observed group. This enabled a better understanding of the processes and mechanisms functioning in the municipality surveyed. In addition, as part of this observation photographs of the area (initiatives) being studied were taken.

Table 2.1. Phases of the study

STAGE OF STUDY	OBJECTIVE OF STUDY	RESEARCH TECHNIQUE	RESULT
INITIAL PHASE	identification of smart village initiatives in Poland; selection of 10 municipalities for research	*My SMART Village* competition; expert panel	Receiving 63 initiatives; presentation of results on the IRWiR PAN website
PHASE I	identification of key research issues; organisation of field studies	desk research	preparation of IDI questionnaires
PHASE II	conducting field studies	in-depth interviews (IDIs) with initiators, beneficiaries and local authorities; observation	collection of research material
PHASE III	achievement of the application objective of the study	content analysis	processing of research material

Source: own work.

In the framework of the study 150 individual in-depth interviews (IDIs) in total were carried out in ten municipalities in Poland where smart village solutions were identified. Two visits were made to each location in order to conduct all interviews as accurately as possible and to make in-depth observation. The non-probability sampling approach was chosen – purposive (in the case of initiators and local authorities) and random (in the case of beneficiaries). The arbitrary selection of the research group was justified by meeting the criterion of optimising the information obtained with a view to answering the research questions asked and determining the impact on various groups of beneficiaries.

The target group of the study were three types of respondents:

1. **Initiators** – persons responsible for the idea, for raising funding and implementing a specific project that fits into smart village assumptions. They are most knowledgeable about the whole process of implementing smart initiatives, they are aware of the needs of the local community and identify "bottlenecks" in the implementation of bottom-up initiatives. This group of people includes heads of villages, councillors, heads of rural municipalities/mayors, heads of NGOs, entrepreneurs.
2. **Beneficiaries** – recipients of the implemented smart initiative, benefitting from it on an everyday basis. They do not know the exact process of implementation of a given project, however, it is persons from this group who report their needs to the local authorities and initiators. It was assumed that some of the beneficiaries participated in the undertakings under study. This group includes e.g. members of rural

organisations (e.g. KGW (Rural Homemakers Clubs), OSP (Voluntary Fire Brigade), other residents.

3. **Local authorities** – responsible for the performance of their own tasks, municipal investments and the distribution of the *sołectwo* fund, in some cases they were also initiators of the smart village solutions. In the study the respondents from this group are understood broadly, i.e. heads of rural municipalities/mayors, councillors, but also managers in the municipality office, social welfare centre, cultural centre, schoolmasters and directors of municipal companies.

Thanks to the diverse composition of the group, the heuristic function of the studies was fulfilled in an optimal way.

It should be stressed that the field studies were part of larger holistic studies that required the application of various research methods, including the induction method (involving observation and recording of facts) and survey methods[6]. Research techniques such as expert opinion, desk research, individual in-depth interviews and external observation[7] were used. Meetings of an expert group allowed for the verification of the results of the desk research analyses, while individual in-depth interviews allowed for the clarification (confrontation) of the conclusions drawn at the desk research phase and expansion of the knowledge of smart solutions. This selection of techniques enabled us to achieve the study objective. Following Virginia Wilson (2014), it can be assumed that the triangulation of research methods enables us to obtain richer, fuller data, and also helps confirm the results of the research.

[6] A diagnostic survey "is a way of acquiring knowledge about structural and functional objects and about the dynamics of social phenomena, opinions and views of the selected communities, about the intensity and trends of the development of specific phenomena, about any other institutionally non-localised phenomena of educational importance, based on a specially selected group representing the general population in which the phenomenon under study occurs" (Pilch, 1977). This method allows obtaining answers to the questions concerning respondents' views, opinions, motives for behaviour, expectations, attitudes (Muchnicka, 1974).

[7] In order to develop the study concept, design scenarios of individual in-depth interviews (IDIs), select municipalities and then arrange interviews, the researchers were required to familiarise themselves with the characteristics of a given unit. This was done through desk research carried out by the research team. The research consisted in a review of publicly available sources of the subject of interest for the study. In the case of this study, these included, inter alia, municipality websites, sołectwo fan pages and blogs, local information portals, Local Data Bank of Statistics Poland, Google Scholar search engine and social media.

2.2. Selection of municipalities for the study

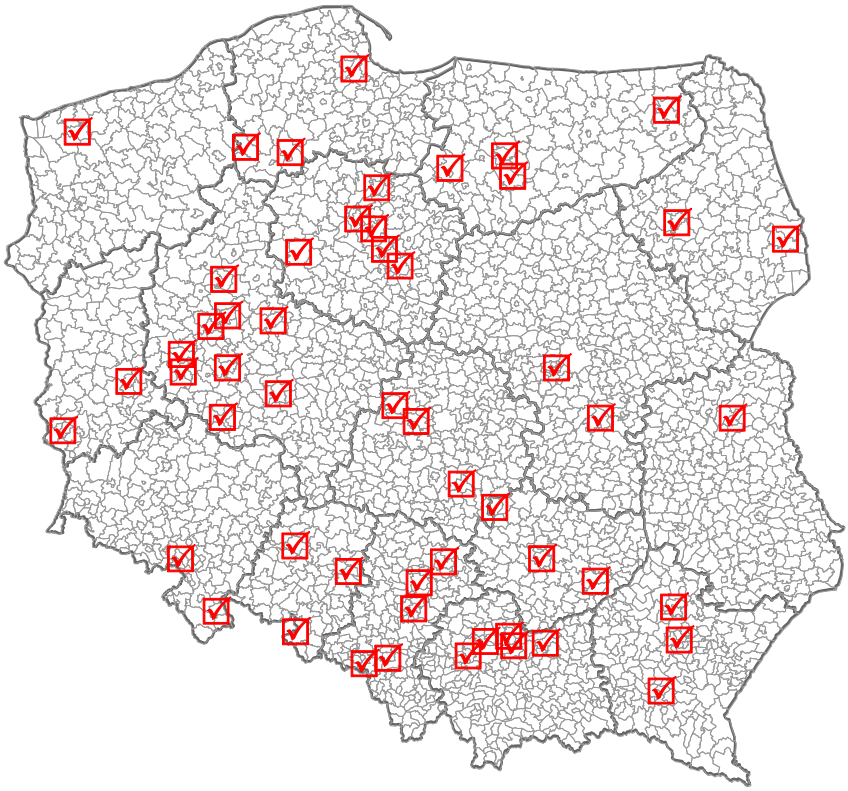


Figure 2.1. Distribution of initiatives submitted to the first competition *My SMART Village*
Source: own work.

The database of municipalities was the list of submissions for the 1st edition of the *My SMART Village* competition organised by IRWiR PAN in 2019 in the framework of the Polish Rural Network's call for proposals. All provinces were represented in the competition (Figure 2.1.). The provinces that submitted the largest number of proposals were Wielkopolskie (nine submissions) and Kujawsko-Pomorskie (six submissions); the smallest – Zachodniopomorskie and Lubelskie provinces (one submission each).

Out of 63 complete submissions (from 54 municipalities), a purposive (expert) selection of ten municipalities from seven provinces was made, taking account of the following: spatial differentiation, socio-economic structure, population, nature of the identified smart initiative (Figure 2.2.; Table 2.2.). In this case the purposive selection of municipalities was necessary to gather in-depth data on the conditions

and mechanisms for undertaking smart initiatives. The selection of respondents in each municipality was also purposive. The use of such a selection procedure was necessary, because the authors of the monograph were only interested in the views of groups with a specific profile – the initiators of the projects, the beneficiaries of the solutions indicated and the local authorities.

According to Andrzej Rosner (1985), the risk of not having a sufficient number of respondents to meet the research assumptions is then minimised. At the same time the advantage of such a selection is that the respondent, in addition to meeting the formal criteria, is to some extent known to the researchers, which makes it easier to reach him/her.

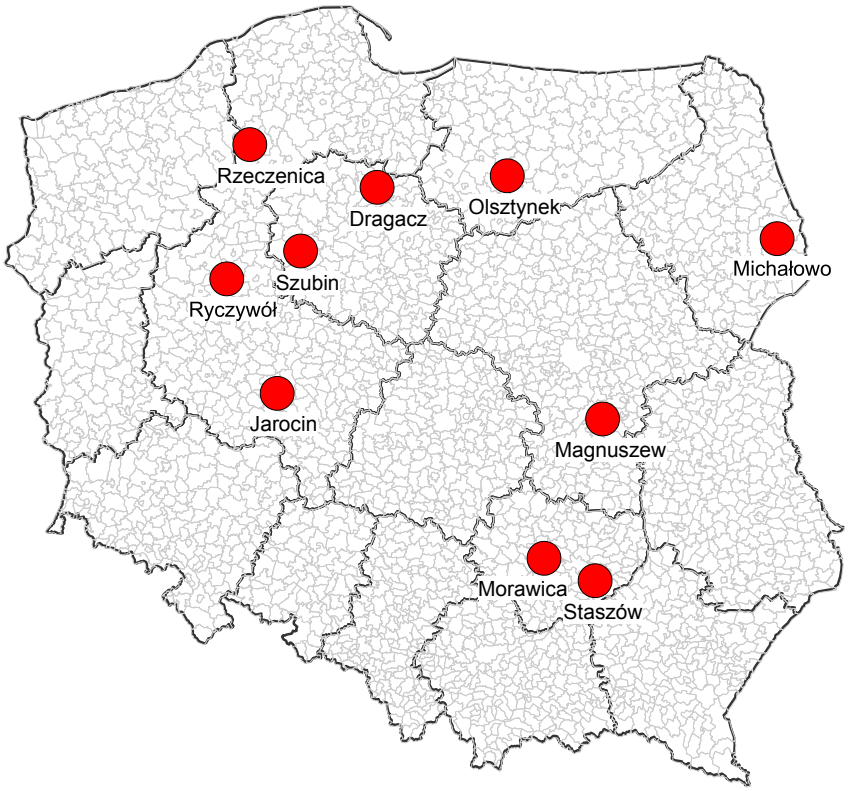


Figure 2.2. Location of municipalities where smart village initiatives were implemented
Source: own work.

Table 2.2. List of initiatives selected for the study

No.	Title of smart initiative (locality)	Municipality (province, county)	Socio-economic structure[8] / population size (no. of people)[9]	Rationale for the selection
1.	Don't chatter, just do it! Rural Actions – urban inspirations (Mniszek)	Dragacz (Kujawsko-Pomorskie, Świecki)	Predominance of large-scale agriculture / 7,216	Award in the first competition *My SMART Village*, several bottom-up initiatives in various areas, e.g. cultural heritage, education, ecology
2.	Retrofitting recreational and educational infrastructure by the pond in Łuszczanów (Łuszczanów)	Jarocin (Wielkopolskie, Jarociński)	Urbanised, reduction of an agricultural function / 45,731	Third place in the first competition *My SMART Village,* a bottom-up initiative combining infrastructural and environmental measures, and those aimed at residents' integration
3.	Local experience as the basis for the village cultural programme, based on the example of Plecionka Association (Magnuszew)	Magnuszew (Mazowieckie, Kozienicki)	Predominance of traditional agriculture / 6,742	Participant in in the first competition *My SMART Village*, several bottom-up initiatives related to culture
4.	A new model of a hospice in rural areas (Michałowo)	Michałowo (Podlaskie, Białostocki)	Predominance of traditional agriculture / 6,565	Award in the first competition *My SMART Village*, a community initiative in healthcare
5.	Smart Village – Piaseczna Górka (Piaseczna Górka)	Morawica (Świętokrzyskie, Kielecki)	Urbanised, reduction of an agricultural function / 16,756	First place in the first competition *My SMART Village*, various bottom-up initiatives, among others: environmental, cultural and stimulating physical activity

[8] According to the typology of rural development in: Stanny M., Rosner A., Komorowski Ł. (2018). *Monitoring rozwoju obszarów wiejskich. Etap III. Struktury społeczno-gospodarcze, ich przestrzenne zróżnicowanie i dynamika*. [Rural Development Monitoring. Stage III. Socio-economic Structures, their Spatial Differentiation and Dynamic.] Warszawa: EFRWP, IRWiR PAN.

[9] According to the data of the GUS Local Data Bank for 2019.

6.	Ostoja Wioska 3.0 (Tomaszyn)	Olsztynek (Warmińsko-Mazurskie, Olsztyński)	Predominance of large-scale agriculture / 13,701	Award in the first competition *My SMART Village*, organic farming in combination with other activities for the local community (e.g. local farmers' markets, bio-markets)
7.	Entertainment and Sports Hall in Ryczywół. How come Ryczywół became smart? (Ryczywół)	Ryczywół (Wielkopolskie, Obornicki)	Multifunctional, balance of sectors / 7,293	Second place in the first competition *My SMART Village*, infrastructural investment in sports and recreation, using new technologies
8.	Smart Village – Rzeczenica	Rzeczenica (Pomorskie, Człuchowski)	Predominance of large-scale agriculture / 3,607	Participant in in the first competition *My SMART Village*, several bottom-up initiatives in various fields, among others, tourism and recreation, education
9.	My Smart Village (Wiązownica-Kolonia)	Staszów (Świętokrzyskie, Staszowski)	Predominance of an agricultural function, intermediate / 25,599	Award in the first competition *My SMART Village*, various bottom-up initiatives, among others: communication with the residents, education, culture
10.	Astronomical, Cultural and Educational Centre (Niedźwiady)	Szubin (Kujawsko-Pomorskie, Nakielski)	Multi-functional, balance of sectors / 24,797	Participant in in the first competition *My SMART Village*, investment in infrastructure combined with that in education

Source: own work.

2.3. Scenarios of individual in-depth interviews

As already noted, three scenarios of individual in-depth interviews were developed. The specific features of each of them related to the type of respondents and the information they could contribute to the studies. All questions were open-ended. The purpose of the questions was to do a reconnaissance of the area, thus to obtain as broad answers as possible to the research questions. Open-ended questions enabled us to understand the perspective of particular participants in the interview and to get to

the opinions that the authors of the project were not aware of at the stage of designing the studies. The form of open-ended questions enabled us to ask additional questions facilitating understanding of the specific character of the regions and projects under study. Some interviews were recorded with the consent of the respondents. In case there was no consent or possibility to record the interview, notes were taken.

2.3.1. IDI scenario – project initiator

1. How does the initiator understand the concept of smart villages?
2. What made him/her undertake the initiative (which incentive)?
3. Was he/she inspired by other initiatives? If so, which ones?
4. How did the author of the solution identify the needs of the local community? Or did he/she not identify them? (talks, public consultations, observation)?
5. How did the process of creating the initiative look?
6. What did cooperation on the initiative (innovation) look like? Who was involved at each stage of planning/creation? How was the involvement of the local community stimulated?
7. What new tools/products were developed? Did the initiative become a driver for other local activities?
8. How did the solution affect the surroundings (value added for the village, municipality, region)? Did it create any collaboration, were new contacts made?
9. How did the concept turn into a sustainable solution? What are the long-term benefits? Did the created solutions prevent the outflow of young residents? How can the initiative encourage the inhabitants to stay/return and new residents to come?
10. In what way is the solution introduced unique? On what scale can we talk about this uniqueness (local, regional, national, global)?
11. Where was support for investment received from? How did the efforts to obtain support look? Was it easy/difficult to receive it? Did a specialist help in obtaining support for the investment (an official, private advisor, NGO member)?
12. What barriers/constraints did they encounter during the investment implementation? To what extent was the final result consistent with the initial assumptions (financial resources, their own contribution, competences, people's engagement)?
13. How should one support leaders so that they would create smart villages? How should one encourage the establishment of NGOs working for the benefit of villages/communities?
14. What good advice would the leader give to potential initiators of similar solutions? What should they pay attention to?

2.3.2. IDI scenario – project beneficiary

1. What investments/initiatives have been carried out recently in your locality/ municipality?
2. If they do not mention the initiative surveyed, have you heard about this initiative (describe)?
3. How did this initiative affect your daily life?
4. How does the initiative stimulate the local economy? Has it brought in more visitors / tourists / new investors?
5. How were you involved in the implementation of the initiative? Did you have such a possibility/invitation to do so? If not, would you like to be involved in similar initiatives in the future?
6. In your opinion, to what extent can this initiative contribute to people's stay or return to the village? Can (does) it encourage inflow of new residents?
7. In what way is the solution introduced unique? On what scale can we talk about this uniqueness (local, regional, national, global)?
8. Have you come across the term 'smart villages'?
9. Do you think that the village (name) aspires to be a smart village?
10. How should local governments / authorities support investments that respond to the needs of the residents (e.g. in the field of smart villages)?

2.3.3 IDI scenario – local authorities

1. How does the respondent understand the concept of smart villages?
2. Did the municipal government participate in the project in any way (an idea, financing, implementation, consulting, giving consents)?
3. If so, how did cooperation on the initiative (innovation) look? Who was involved in the different stages of planning/creating? How was the involvement of the local community stimulated?
4. What new tools/products were developed? Did the initiative become a driver for other local activities?
5. How did the solution affect the surroundings? Did it lead to any collaboration, were new contacts made?
6. How does the innovation improve the quality of life of the residents?
7. What is the value added for the village / municipality / region?
8. How did the concept turn into a sustainable solution? What are the long-term benefits? Did the created solutions prevent the outflow of young residents? How can the initiative encourage the inhabitants to stay/return and new residents to come?
9. In what way is the solution unique? On what scale can we talk about this uniqueness (local, regional, national, global)?

10. Does the solution generate additional costs/allow for savings in the municipal budget? Are these costs somehow compensated by revenues or lower opportunity costs / alternative costs?
11. How should one support leaders so that they would create smart villages? How should one encourage the establishment of NGOs working for the benefit of villages/municipalities?
12. What good advice would the respondent give to potential initiators of solutions similar to yours?
13. Does the local government see the need to launch smart village projects? How should (and can) the local government support such initiatives? To what extent do legal regulations / financia / human resources enable your involvement in bottom-up initiatives?

2.4 Characteristics of the municipalities and initiatives surveyed

2.4.1 Dragacz Municipality

Dragacz is a rural municipality situated in the northern part of the Kujawsko-Pomorskie province, in Świeckie county. It is located in the vicinity of the forests in the Nadwiślański Landscape Park and the Protected Eastern Area of the Tuchola Forest Landscape, very close to the A1 motorway. The municipality is composed of twelve *sołectwos* (Bratwin, Dolna Grupa, Dragacz, Fletnowo, Górna Grupa, Grupa, Grupa Osiedle, Michale, Mniszek, Wielki Lubień, Wielkie Stwolno, Wielkie Zajączkowo), comprising fifteen villages in total. The area of the municipality is 111.1 km^2. The number of inhabitants in 1995 was 7,494, while in 2017 it was 7,279, which means that there was a slight decrease in the population. The average population density is 65 people per km^2.

The initiative was developed in the small *sołectwo* of Mniszek. In 2011 the *sołectwo* consisted of two villages: Nowe Marzy and Mniszek, divided into four parts by the motorway and the national road, with numerous detours (some of them as long as 7 km from one part of the village to another). In the opinion of the initiators, the village is treated as a peripheral area of the municipality due to its small population (287 people); it has no sewage or water supply systems.

The initiators of the actions taken for the local community were Ms Dorota Dembińska, Head of the Village, and Ms Sylwia Dembińska. Through the use of social innovations and new solutions, they wanted to provide the residents with the best possible living space and align their standard of living with that in urban areas. As the authors of the initiative think, technological progress and the possibility of using digital skills and state-of-the-art technologies in everyday village life were of particular help in the implementation of the measures. The actions focused on four spheres of village life:

1. social – education (training, workshops, study tours), sports (organisation of sport competitions), spending time together and integration, care for the village's elderly residents and those in need,
2. cultural – traditions, customs, rituals, artistic creativity (handicrafts, theatre performances, contests, shows),
3. environmental – taking care of nature, recycling, upcycling,
4. economic – working on the establishment of a thematic village and community centre with a wide range of workshops.

Over the period of eight years (2011-2019), forty projects were implemented in the village within these spheres without financial support or external funds. They included:

- family and recreational events,
- theatrical performances,
- art competitions for the whole municipality, e.g. "25 Years of Freedom – What is Democracy for Me?" "Legends and Fables from Poland and Caucasian Countries" (together with the Refugee Centre in Grupa),
- publications, e.g. "The Toolkit for the Rural Homemakers from Mniszek", "Chronicle of Mniszek", "Digitalisation of Photos Collected from the Residents",
- workshops aimed at counteracting digital exclusion of the 50+ generation and people from other age groups for whom computer skills are essential to function in the current world – "Lighthouse Keeper of Digital Poland" in Dragacz municipality,
- cooperation with the Refugee Centre in Grupa in the organisation of meetings and cultural events (breaking stereotypes towards other cultures – from Transcaucasian countries).

All initiatives were (and still are) targeted to both children and adults living in the *sołectwo*. The measures contribute to mobilising adults and serve to initiate intergeneration cooperation, e.g.:

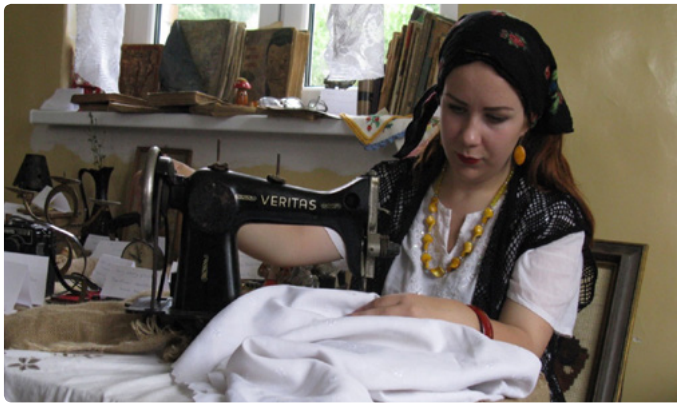
- "Grandparents to Grandchildren. The history that surrounds us" – the history of the village was presented during educational classes,
- "I am from Kociewie" – including the Cultural Ethno Design Ferment from Kociewie – the use of folklore in decorative arts and designing clothes,
- "Medicines from God's Pharmacy" – making natural cosmetics; planting, collecting herbs and flowers and making medicines, ointments, natural cosmetics – macerates from them,
- "The neighbours that we don't know" – organising workshops at which young people learn new skills from their neighbours,
- "You can't just live to work" – organising entertainment in the village (picnics, markets, festivals, exhibitions, Village Dance Club – a social event set to folk tunes).

The following organisations, among others, were the external source of funding the initiatives implemented: the Rural Development Foundation (FWW), the Marshall's Office (Administration of the Province), the programme of the Civic Initiatives Fund, the Bank Gospodarstwa Krajowego Foundation.

The village community centre plays an important role in the village; it hosts year-round activities for children and adults. They are carried out free of charge by volunteers who share their skills and knowledge. Thanks to these activities, training, workshops, lectures or study tours are organised.

The implemented initiatives were designed to reduce barriers between rural and urban areas in access to training, workshops, events and new technologies. The initiators took care so that the inhabitants acquired new skills, received training and got to know their own value, were inspired by examples and good practices from all accross Poland, and so that the skills they acquired could be put into practice.

Photograph 2.1. Training in computer skills for seniors in Mniszek
Source: Dorota Dembińska.



Photograph 2.2. Training in the use of folklore in decorative arts and designing clothes
Source: Dorota Dembińska.

Photograph 2.3. Location of the *sołectwo* of Mniszek
Source: Dorota Dembińska.

Photograph 2.4. The building of the rural community centre in Mniszek
Source: Anna Rosa.

2.4.2. Jarocin Municipality

Jarocin municipality is situated in Jarociński county, Wielkopolskie province. It is an urban-rural municipality. It is is adjacent to the following municipalities: Dobrzyca, Jaraczewo, Kotlin, Koźmin Wielkopolski, Nowe Miasto nad Wartą, Żerków. It consists of twenty three *sołectwos*. The area of the municipality is 200.23 km^2. It is inhabited by 45,800 people. The average population density is 229 people per km^2. There has been some slight decline in the municipality's population.

The initiative itself is located in the village of Łuszczanów, which is one of the *sołectwo* villages inhabited by approximately 870 people. The initiative – "Retrofitting the recreational and educational infrastructure by the village pond in Łuszczanów" – was implemented by a natural water reservoir (the village pond – former cattle watering place, area of approx. 410 m^2), located in a depression by the Brodek stream, at the northern edge of Łuszczanów village. The investment was initiated by the village leader of Łuszczanów together with the *sołectwo* Council and the Village Renewal Group, the Association for Integration and Development of Łuszczanów Village. The initiative was submitted to the competition by Mr Łukasz Witczak, member of the *sołectwo* Council, who is called by the locals one of the two local Midases (the number of initiatives and ideas submitted by these gentlemen is so huge that it could fill the whole book).

The entire initiative is valued by its authors at PLN 147,000, of which the *sołectwo's* own contribution was 33,800, funds from the municipal budget – 28,700, the *sołectwo* fund – 25,000, and the remaining 60,000 came from grants and competitions. The project was implemented in 2016-2019. The initiative involved deepening, cleaning and restocking the pond; levelling out part of the area around the pond; levelling out the access road to the pond; planting some trees (willows); removing a dead tree; creating a rock garden and a hearth; placing several benches by the hearth and an information board with regulations. At the second stage land development works around the pond were carried out: assembly of a wooden barbecue hut, installation of an automatic wireless meteorological station (equipped with a solar set and a GPRS modem) for educational purposes (measured parameters: air temperature and humidity, pressure, precipitation, wind speed and direction, UV and solar radiation, water temperature, ground temperature). During the third stage further development works in the area around the pond were carried out: construction of a bridge-type surface made of planed wooden planks on joists (anchored in concrete foundation footings), construction of a separate toilet with a prefabricated sceptic tank for domestic sewage, furnishment of the area with small landscaping elements – benches and waste bins, installation of lighting – a hybrid lamp powered by photovoltaic modules and a wind turbine equipped with an LED light. During the last stage, the barbecue hut was equipped with electrical installation, including lighting powered by a photovoltaic module.

This is a typical initiative aimed at enhancing the quality of life of the local residents by creating an educational and recreational space. The area provides an amenity for the local residents. Its advantage is a wide range of works, but also the use of the area.

Photograph 2.5. A view of the pond and shed in Łuszczanów
Source: Łukasz Witczak.

Photograph 2.6. A view of the pond in Łuszczanów
Source: Sławomir Kalinowski.

Photograph 2.7. The hearth and benches by the shed in Łuszczanów
Source: Sławomir Kalinowski.

Photograph 2.8. A view of the wireless meteorological station in Łuszczanów
Source: Sławomir Kalinowski.

2.4.3 Magnuszew Municipality

The rural municipality of Magnuszew is located in the southern part of Mazowieckie province, Kozienicki county, by the Vistula river. It takes just over an hour to get from Magnuszew to Warsaw. The municipality is inhabited by 6,700 people and that number has been relatively stable since the 1990s. Agriculture and horticulture dominate within the socio-economic structure of the unit – the municipality is located in Grójecki-Warecki region, known as the Polish fruit-growing centre. The municipality consists of 32 *sołectwos*.

The smart actions identified in the unit analysed have a municipality-wide character, i.e. they are located in different villages (e.g. in Przewóz Tarnowski, Chmielew) and addressed to all the residents living in the area under the local government. The

projects were usually financed in the framework of national grants announced by non-governmental organisations. Their costs ranged from several to several dozen thousand zlotys. The target group was mainly children and young people from the municipality. The following initiatives were surveyed:

- art workshops for young people; the category of education and promotion of culture,
- "Barefoot through the Village" project, which involved building a beach volleyball court, drawing up a map of the most interesting sites in the municipality and organising a series of workshops and excursions; the category of strengthening local identity and recreation,
- production of a Polish-Czech film, preceded by a film workshop; the category of mobilising residents and promoting culture,
- other initiatives, undertaken in particular by the Plecionka Association.

Photograph 2.9. The map of the most interesting sites in the municipality drawn up by the residents
Source: Łukasz Komorowski.

Photograph 2.10. Exhibition of lomographies (made by the residents) in the community centre in Przewóz Tarnowski
Source: Łukasz Komorowski.

Photograph 2.11. Exhibition of lomographies (made by the residents) in the community centre in Przewóz Tarnowski
Source: Łukasz Komorowski.

Photograph 2.12. The retrofitted community centre in Przewóz Tarnowski
Source: Łukasz Komorowski.

Photograph 2.13. The logo of the Plecionka Association operating in Magnuszew municipality
Source: Plecionka (https://www.facebook.com/Plecionka-879042392176643)

2.4.4 Michałowo Municipality

Michałowo Municipality is located in Podlaskie province, Białostocki county, on the border with Belarus. It is adjacent to the following municipalities: Gródek, Narew, Narewka, Zabłudów. The area of the municipality is 409.19 km², and it is composed of 27 *sołectwos* and 80 localities. The Narew River runs through the municipality. Until 2008 Michałowo was a rural and since 2009 it has been an urban-rural municipality. The population in 2012 was 7,100, in 2016. – 6,800, while in 2019 – 6,600, which implies strong depopulation processes. Taking into account an unfavourable age pyramid, i.e. people at the post-working age constitute 27.6% and in rural areas – 30.7% of the population, a project entitled "New model of hospice in rural areas" seems to be an extremely important solution. The demographic dependency ratio (post-working age population per 100 people of working age) is 47.5, while the old-age dependency ratio is 37.2. Furthermore, 54% of the residents live in rural areas.

The in-depth study covered the initiative located in the municipality of Michałowo, addressed to the rural residents, who are the elderly, the ill (including the terminally ill, dependent on others, very often at the end of their lives), and their caregivers. The initiators of the actions were Mr Paweł Grabowski and Ms Anna Borysiewicz together with the Foundation of Prophet Elijah Hospice. So far the home hospice model has been functioning, however the initiators plan an inpatient hospice which will also have solutions typical of smart villages.

The innovation is an extremely important social initiative aimed at people who are at significant risk of exclusion, namely the ill and the elderly. The healthcare system is inefficient and often has insufficient financial capacity. Innovative measures therefore allow greater access to healthcare. In addition, the problems of rural areas, where there are far fewer facilities, have an impact on the system limitations. If aging of the rural population in Poland is taken into account, the great significance of the project can be seen. The innovative hospice model initiated is based on two pillars:

1) the adaptation of Hospice services to the real needs of the ill in rural areas,

2) the inclusion, in the Hospice team, of caregivers who can relieve specialists of caring for the ill and provide respite assistance to the those caring for the ill.

The authors of the project point out that the overall cost of patient care fell by one third in the assistance model they propose. Doctors visit patients at home at least once a month and a nurse once or twice a week. Depending on the requirements and needs of the patients, also physiotherapists and psychologists come to them. The Hospice has a rental service of medical and rehabilitation equipment. Home hospices provide their services in five municipalities and two counties in Podlaskie province. Without using drones, robots and state-of-the-art technologies, the authors of the project are building a smart village.

Photograph 2.14. A photo from the home Hospice in Michałowo municipality
Source: Piotr Mojsak.

Photograph 2.15. Nadzieja, a patient in the home Hospice in Michałowo municipality
Source: The Archive of the Foundation of Prophet Elijah Hospice.

Photograph 2.16. Mikołaj, a patient in the home Hospice in Michałowo municipality
Source: The Archive of the Foundation of Prophet Elijah Hospice.

Photograph 2.17. The in-patient hospice building under construction in Michałowo municipality
Source: The Archive of the Foundation of Prophet Elijah Hospice.

Photograph 2.18. The building in which the Foundation of Prophet Elijah Hospice has a seat at present
Source: Sławomir Kalinowski.

2.4.5 Morawica Municipality

The urban-rural municipality of Morawica is located in Kieleckie county, Świętokrzyskie province. It borders the city of Kielce to the south. In 2019 the municipality population was 16,800, including 15,000 in rural areas. Since 1995, the number of inhabitants has increased by 40%. National road 73 crosses the municipality, which enables people to get to Kielce in fifteen minutes. Due to the proximity of the provincial capital and its influence, the unit can be described as urbanised, where the agricultural function is being reduced in favour of off-farming activities. The municipality

is composed of 24 sołectwos, and the largest of them, Bilcza, is inhabited by about 3,500 people, which means that it twice as populous as the town of Morawica.

The in-depth study covered the initiatives implemented in one sołectwo, Piaseczna Górka, located in the north of the municipality. The locality is inhabited by 600 people and is called a 'dormitory village', i.e. a large part of its residents stay in Kielce during the day (work, education, recreation, etc.). Within the last 20 years the number of Piaseczna Górka residents has tripled, mainly due to the inflow of people from Kielce.

The projects implemented in the municipality (apart from cost-free ones related to communication) were financed from various sources, among others: National Fund for Environmental Protection and Water Management, grants, enterprise funds. Most of the projects were carried out in cooperation between the village association and other entities, often operating on a regional or even national scale. The residents of the village were involved in the initiative, thanks to which a kind of solidarity around a common interest was created. The costs of the projects were at the level of a few thousand zlotys, rarely tens of thousands of zlotys.

The subject of the study were the following initiatives identified as those that fit into the smart village concept:

- a group of residents and the village association's Facebook page; the category of communication with residents,
- creation of a rain garden and installation of solar lamps in the centre of the village; the category of environmental measures and energy,
- an open-air self-service library in a public place; the category of promoting culture and the idea of bookcrossing,
- a questing trail; the category of education and strengthening local identity,
- other initiatives undertaken, inter alia, by the "Z Górki" Rural Association.

Photograph 2.19. The playground for street-ball, football and gazebo with state-of-the-art LED lighting (Piaseczna Górka)
Source: Łukasz Komorowski.

Photograph 2.20. The rain garden in the area at risk of flooding in the centre of Piaseczna Górka
Source: Łukasz Komorowski.

Photograph 2.21. The open-air library in an antique phone box in Piaseczna Górka
Source: Łukasz Komorowski.

Photograph 2.22. The board containing information on plants in the rain garden in Piaseczna Górka
Source: Łukasz Komorowski.

Photograph 2.23. A view of the recreation centre and the rain garden in Piaseczna Górka
Source: Łukasz Komorowski.

Photograph 2.24. The hearth and benches in Piaseczna Górka
Source: Łukasz Komorowski.

Photograph 2.25. Can smart initiatives encourage people to settle down here?[10]
Source: Łukasz Komorowski.

[10] The banner inscription states: I live here, I pay tax here. File your tax return where you live and have an impact on local development. 38% of your tax supports the development of the municipality.

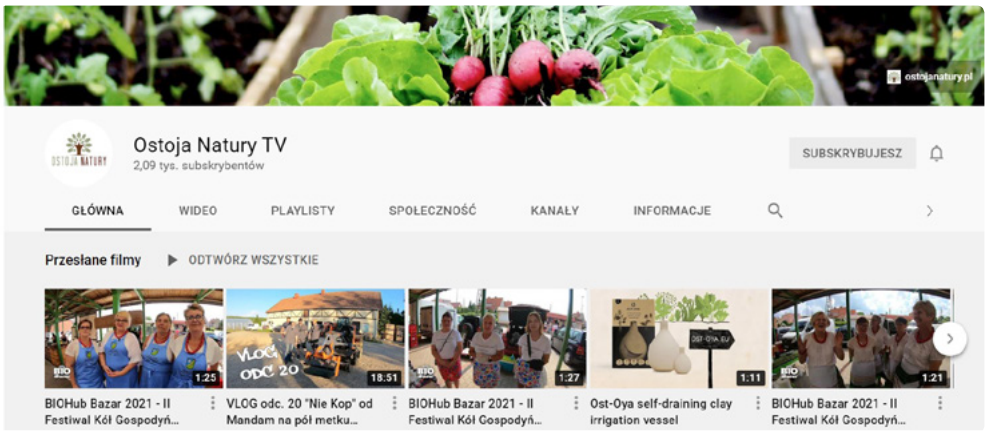
2.4.6. Olsztynek Municipality

The urban-rural municipality of Olsztynek is located in Olsztyński county, Warmińsko-Mazurskie Province. Express roads S7 and S51 cross the municipality, as a result of which it takes around 30 minutes to travel to Olsztyn. In 2019 the population of the municipality was 13,700, including 6,200 in rural areas. Since 1995 the number of municipality residents has been stable. The local government of Olsztynek is composed of 32 *sołectwos*.

The activity of the Agricultural Production Cooperative "Ostoja Natury" (Refuge of Nature) called Ostoja Wioska 3.0. is covered by the study. Its seat is located in Tomaszyn village (which belongs to the *sołectwo* of Samagowo). It is a very small village surrounded by forests, located at the northern edge of the municipality. It consists of only four farms and a few summer houses. Tomaszyn is one of 21 European villages included in the "Smart Rural 21"[11] programme.

The actions taken by the cooperative fit into the broadly defined concept of smart villages, including smart agriculture. The projects described below were mostly financed by the cooperative and partners' own resources, although public funds (e.g. from the RDP) were increasingly provided. The initiatives comprise, among others:

- year-round production of high-quality food, including the use of state-of-the-art technologies; the agriculture category,
- activity in line with the zero-waste idea, rainwater-based irrigation systems, a passive greenhouse, use of solar panels and water turbines; the environmental and energy category,
- sales of products through short supply chains; the category of entrepreneurship development and mobilisation of residents,
- information, cultural, entertainment activities carried out through online channels; the communication category.



Photograph 2.26. Ostoja Natury TV – information, education and documentary channel (on YouTube)
Source: Screenshot of the Ostoja Natury TV site on YouTube.

[11] https://www.smartrural21.eu/villages/.

Photograph 2.27. A view of the farm of the Agricultural Production Cooperative "Ostoja Natury" in Tomaszyn
Source: Łukasz Komorowski.

Photograph 2.28. Organic crops in "Ostoja Natury" in Tomaszyn
Source: Łukasz Komorowski.

Photograph 2.29. Crops grown in "Ostoja Natury" using No-Dig technology (Tomaszyn)
Source: Łukasz Komorowski.

Photograph 2.30. A polytunnel using new production technologies in "Ostoja Natury" in Tomaszyn
Source: Łukasz Komorowski.

Photograph 2.31. Irrigation of crops applying the cooperative's original Ost-Oya system in "Ostoja Natury" in Tomaszyn
Source: Łukasz Komorowski.

Photograph 2.32. The road sign to the Bio Hub Bazar open every Sunday in Olsztynek
Source: Łukasz Komorowski.

2.4.7. Ryczywół Municipality

The rural municipality of Ryczywół is located in Obornicki county, Wielkopolskie province. Until 1998 it was part of Pilskie province. It is adjacent to the following municipalities: Budzyń, Czarnków, Oborniki, Połajewo, Rogoźno. The area of the municipality is 154.54 km^2. The municipality consists of 14 *sołectwos*. In 2011 the number of inhabitants was nearly 7,400, in 2016 it increased by about 50, to fall to 7,300 in 2019. This implies minor depopulation processes. 20.8% of the population is at pre-working age and 17.8% at post-working age. There are no lakes in the municipality, which means it has no chance (as compared to the surrounding units) to attract tourists. Almost one fourth of the municipality area is covered by forests.

The in-depth study covered the initiative of the entertainment and sports hall in Ryczywół and also related activities, e.g. the pump-track and the bicycle repair station. Some residents pointed out that Ryczywół was a 'dormitory village' for Poznań and Wągrowiec, even though it is located about 60 km from the former, and young people are leaving the village for bigger towns. The initiative itself perhaps was not supposed to encourage young people to stay in Ryczywół, but rather to show that "life in rural areas could be a mark of quality rather than of shame" (statement by one of the respondents). The investment was initiated by the then head of the municipality Ms Renata Gembiak-Binkiewicz and the Chairman of the Municipality Council Mr Michał Bogacz. Their aim was to build a real sports hall so that the residents would be proud of it. The entertainment and sports hall was built with the support of the Regional Fund for Environmental Protection (a preferential loan of over PLN 1.8 million) and the Ministry of Sport and Tourism (PLN 3.5 million). The entertainment and sports hall is characterised by many ecological and technological solutions: a ground heat exchanger, a system fully recuperating heat from used air, external blinds which react automatically to the insolation level, a service water mixer that optimises energy consumption. In addition, the entertainment and sports hall is covered with a 1.5-meter layer of special grey polystyrene preventing heat losses in winter and overheating in summer. It is heated by a biomass-fuelled boiler, and to heat 2,000 m^3 of the building, it is enough to have the same quantity of pellet as for two small detached houses. There is only LED lighting in the entertainment and sports hall, and it is switched on in the corridors, cloakrooms and sanitary rooms thanks to motion sensors. Large energy-saving windows were designed on the southern side of the entertainment and sports hall and small windows on its northern side.

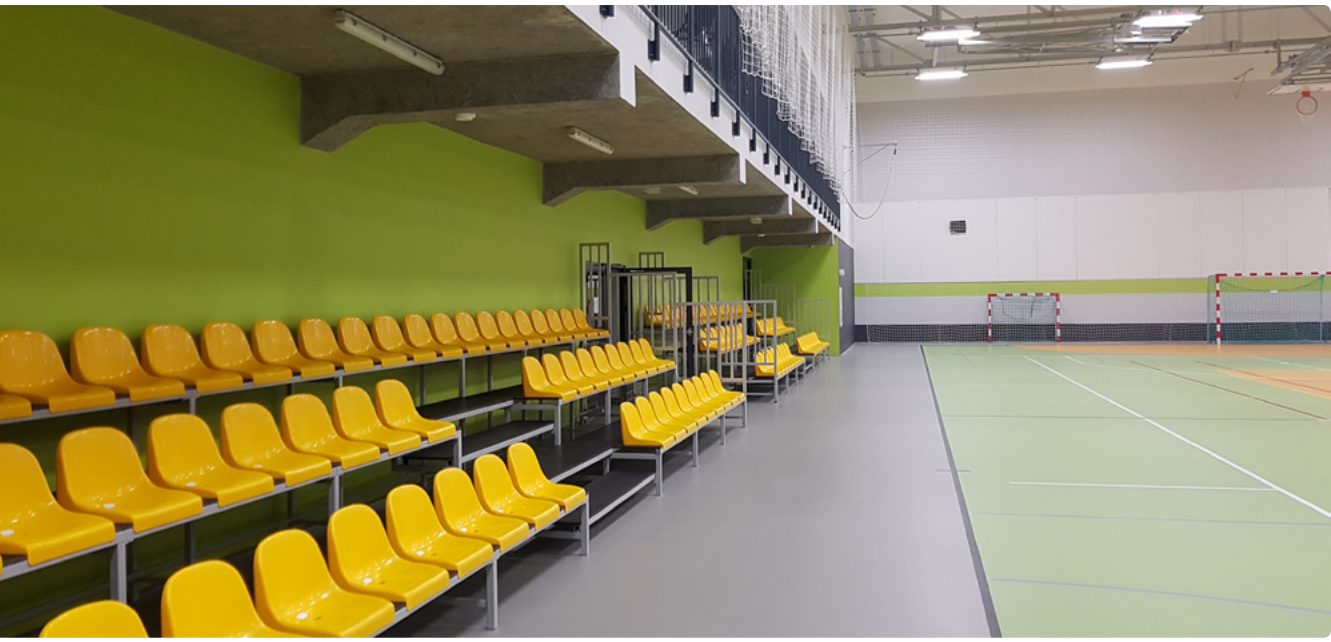
The entertainment and sports hall is used by the residents of all ages, and activities are run almost all day long. As it is possible to divide the entertainment and sports hall into separate parts, up to several sports teams can train there at a time. The entertainment and sports hall is equipped with a control-room and a roll-out mat to prevent damage to the floor, so that it can be used for purposes other than sports. The value that characterises the entertainment and sports hall is a possibility to mobilise and to

integrate a large group of residents. The entertainment and sports hall has a conference room where various social and official meetings are held.

In addition to the entertainment and sports hall, a pump-track for bicycles and a bicycle repair station were built. The strong engagement of associations, including "Czynnik Rodzinni", "AleBabki" and "KGW Pasjonatki", is an important aspect the actions and the reason why the village can be considered as smart. The project's initiator believes that there are around forty such associations in the municipality. Ryczywół alone is inhabited by just over 2,000 people, and as the observation shows they own one of the most advanced entertainment and sports halls in Poland.

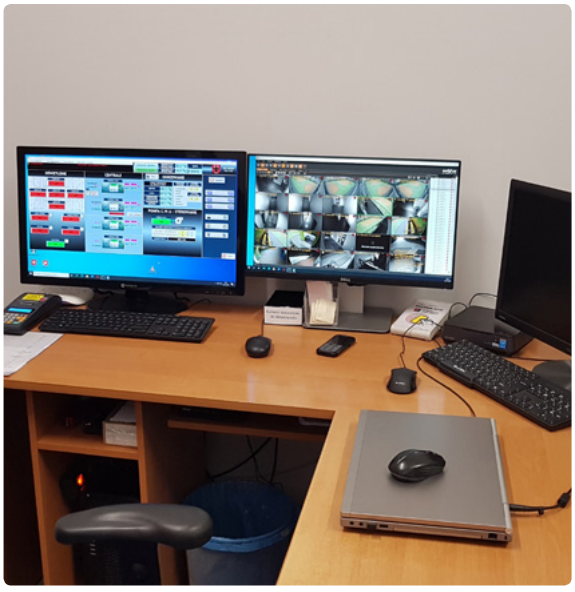
Photograph 2.33. The Entertainment and Sports Hall in Ryczywół
Source: Sławomir Kalinowski.

Photograph 2.34. The Entertainment and Sports Hall in Ryczywół
Source: Sławomir Kalinowski.



Photograph 2.35. The Entertainment and Sports Hall in Ryczywół
Source: Sławomir Kalinowski.

Photograph 2.36. The recuperation system in the Entertainment and Sports Hall in Ryczywół
Source: Sławomir Kalinowski.



Photograph 2.37. The control room in the Entertainment and Sports Hall in Ryczywół
Source: Sławomir Kalinowski.

Photograph 2.38. The market square in Ryczywół[12]
Source: Sławomir Kalinowski.

Photograph 2.39. The Entertainment and Sports Hall in Ryczywół, shelves displaying awards for sports achievements
Source: Sławomir Kalinowski.

[12] The Ryczywół coat of arms features the black head of an ox ox with white horns. Loosely translated, Ryczywół means "roaring ox".

Photograph 2.40. The pump-track and a view of the school in Ryczywół
Source: Sławomir Kalinowski.

Photograph 2.41. The bicycle repair station in Ryczywół
Source: Sławomir Kalinowski.

2.4.8. Rzeczenica Municipality

Rzeczenica Municipality is located on the border of Pomorskie and Zachodniopomorskie, in the south-western part of Pomorskie province. The municipality belongs to Człuchowski county. The area of the municipality is 274.92 km². The terrain is characterised by a very high degree of afforestation (more than 66% of the area is covered by forest). The municipality is inhabited by 3,614 people and the population density is just over 14 people per km². The municipality consists of twenty four localities in seven *sołectwos*: Breńsk, Brzezie, Gwieździn, Międzybórz, Olszanowo, Pieniężnica and Rzeczenica. The municipality of Rzeczenica has the largest number of residents (1,491, which accounts for more than 40% of the total municipality population).

The in-depth study covered the initiatives undertken in the *sołectwo* of Rzeczenica by Mr Bartłomiej Ożański and Ms Ewelina Ławecka, who set up the Art Corner ("Zakątek Sztuki") Foundation. The project started in September 2019, but unfortunately due to the SARS-CoV-2 coronavirus pandemic, it was impossible to implement all the planned initiatives.

The authors of the project designed an environmental "Bookworm's Bench" which entered the first stage implementation. A QR code was placed on the bench (the app developed enables borrowing books and checking what books are available in a particular *sołectwo*).

"Bookworm's Benches" form an element of local community integration (on each bench there are books which can be read on the spot or taken home). They also constitute a cultural and innovative element (the use of the app to borrow books, developed especially for this project and the municipality).

Currently, the "Bookworm's Forest" project is at the next stage of its implementation, which is to involve the creation of the Forest Library in the form of a Tree of Books (it will be located in the area designated by the municipality for Art Corner Foundation activity).

The Foundation also offers a mechatronics workshops for students in grades six to eight of primary school. Students will work, among others, on Arduino Uno boards while preparing elements of smart villages. The resulting projects will be their independent work, created under the supervision of an electronics engineer, programmer and master of sciences in industrial design.

The authors of the initiative plan to mark the municipality of Rzeczenica with a Beacon[13] transmitter to promote tourist attractions, so that people passing through the municipality (it is located on the route to Koszalin and Berlin) will have an opportunity to see what attractions there are in its area. The Foundation wants to mark sites worth seeing in the municipality, which after crossing the municipality border will be displayed on a specially developed app (with an access map and brief information about the given object or attractive service).

Funds necessary for the implementation of the actions taken were provided by the authors of the initiative, the municipality and companies.

Photograph 2.42. The "Bookworm's Bench" in Rzeczenica
Source: Anna Rosa.

[13] https://blog.estimote.com/post/177348177680/estimote-lte-m-beacon

The beneficiaries of the actions taken, depending on the stage and implementation of the tasks, will be as follows:

- the residents of Rzeczenica municipality (7 sołectwos) and Rzewnica (the area located by Szczytno Lake),
- tourists visiting the municipality,
- people passing through the municipality interested in learning something about the village,
- youth (who are up-to-date with the solutions applied in urban areas) as developers of smart solutions and creators of their living space.

Photograph 2.43. The forest library in the form of a Tree of Books in Rzeczenica
Source: Anna Rosa.

The initiators plan, in cooperation with the local community, to develop further innovations to facilitate life in the village, while making it a modern place, retaining its unique atmosphere and charm, where one can find zones free from 'network coverage' and be 'in life', and not only 'online'.

2.4.9. Staszów Municipality

The town of Staszów is located in Świętokrzyskie province and it is the seat of the urban-rural municipality bearing the same name and Staszowski county. It is situated close to the border of Podkarpackie and Małopolskie provinces. The journey by car from Staszów to Kielce takes about 60 minutes. The municipality is inhabited by 25,600 people, including 11,000 in the rural area. Over the last 25 years the municipality has shrunk by

about 10% – the process of population outflow affects mainly the town of Staszów. In terms of socio-economic structure, the agricultural function dominates in the municipality, but it is of an indirect character, i.e. within the next dozen or so years it may be transformed towards off-farming activities. The municipality consists of 35 *sołectwos*.

The study covered the smart village initiatives identified in the village of Wiązownica-Kolonia. The village is located at the eastern edge of the municipality, in the Kacanka River valley. It is inhabited by approx. 450 people, and this number is systematically falling (by over 100 in the last dozen or so years). Projects were implemented using various sources of funding (about several thousand or more than ten thousand zlotys), e.g. the Ministry of Digitalisation, grants, the *sołectwo* budget, public collections. Other organisations, including regional and national ones, as well as the village residents, also joined in.

The following projects were subject of an in-depth analysis:

- an information and consultation blog run by the head of the village and a database of residents' mobile phone numbers for contact via SMS and MMS; the category of communication with residents,
- computer classes and training in computer literacy and internet use; the category of education and digital competences,
- video surveillance with alarm in the central part of the village; the safety category,
- creation of a mural on the neglected old dairy building; the category of residents' mobilisation,
- other initiatives undertaken, among others, by the "Dolina Kacanki" (Kacanka River Valley) Local Activity Association and the "PasjoDzielnia" Foundation.

Photograph 2.44. The *sołectwo's* mural in Wiazownica-Kolonia designed by the residents (the figure of the beaver makes an allusion to the village's location by the river)
Source: Łukasz Komorowski.

Photograph 2.45. The stage for various events in Wiązownica-Kolonia (organised at the PasjoDzielnia Foundation)
Source: Łukasz Komorowski.

Photograph 2.46. Cinema in the cowshed located on the farm owned by the Head of Wiązownica-Kolonia and his wife
Source: Łukasz Komorowski.

Photograph 2.47. The relaxation zone in the cowshed in Wiązownica-Kolonia
Source: Łukasz Komorowski.

Photograph 2.48. A 300-year-old forest lighthouse located close to the old school in Wiązownica-Kolonia – cultural heritage may also constitute an element of a smart village
Source: Łukasz Komorowski.

Photograph 2.49. A classroom in the old school in Wiązownica-Kolonia – this is where workshops are held
Source: Łukasz Komorowski.

Photograph 2.50. Start to change the world in your locality – the motto of Wiązownica-Kolonia residents
Source: Łukasz Komorowski.

Photograph 2.51. Blog of the Head of Wiązownica-Kolonia – information channel for the residents
Source: screenshot of the website soltyswsi.pl.

2.4.10 Szubin Municipality

Szubin is an urban-rural municipality located in the north-east part of Pałuki in Kujawsko-Pomorskie province. The municipality of an area of 332.3 km² is part of Nakielski county. It is inhabited by 23,837 people and the population density is 74 persons per km² (as at end-2020). The municipality comprises thirty eight *sołectwos*. 61.1% of the population is at working age, 20.2% at pre-working age and 18.7% – post-working age.

The in-depth study covered the smart village initiative identified in the village of Niedźwiady, where the Astronomical, Cultural and Educational Centre was established. This is a project implemented by Szubin municipality in the period 2019-2020 in the framework of the Regional Operational Programme of Kujawsko-Pomorskie for 2014-2020 (Priority Axis 7 *Community-Led Local Development*). The total cost of the investment is PLN 1,848,870.37, including co-funding at the level of PLN 1,394,546.37 obtained by Szubin municipality.

Thanks to the establishment of the Astronomical, Cultural and Educational Centre, projects of a social and economic nature will be implemented. This is the largest amateur astronomical observatory in Poland (thanks to the use of the largest Newtonian telescope on a parallactic mount, 603 mm in diameter and 2,802 mm in focal length), run by the "Local Group" Pałucko-Pomorskie Astronomical and Environmental Association.

The projects will be primarily aimed at supporting students with special development and educational needs during special recovery classes. The planned actions of a social nature include the following:

- the project "Closer to the Stars" Youth Club, under which it is planned to undertake activities for children and youth (including those from families at risk of poverty or social exclusion), aimed to increase educational levels,

Photograph 2.52. The Astronomical, Cultural and Educational Centre in Niedźwiady
Source: Anna Rosa.

Photograph 2.53. The Astronomical, Cultural and Educational Centre in Niedźwiady
Source: Anna Rosa.

- the project "Key Competences – a Way to Success", under which it is planned to support students (from primary schools) in educational processes in order to develop key competences (mathematics and natural sciences); activities aimed to support the choice of sciences-oriented path of education.

The authors of the initiative believe that the implementation of the project will contribute to the residents' increased awareness and more positive attitude to taking measures aimed at developing local entrepreneurship. Stimulation of local entrepreneurship will be achieved, among others, through actions supporting education and awareness raising. Revitalisation-oriented measures will contribute to increasing residents' competencies and vocational skills and to setting up and running new businesses by individuals.

Photograph 2.54. The Astronomical, Cultural and Educational Centre in Niedźwiady
Source: Anna Rosa.

Photograph 2.55. The Astronomical, Cultural and Educational Centre in Niedźwiady
Source: Anna Rosa.

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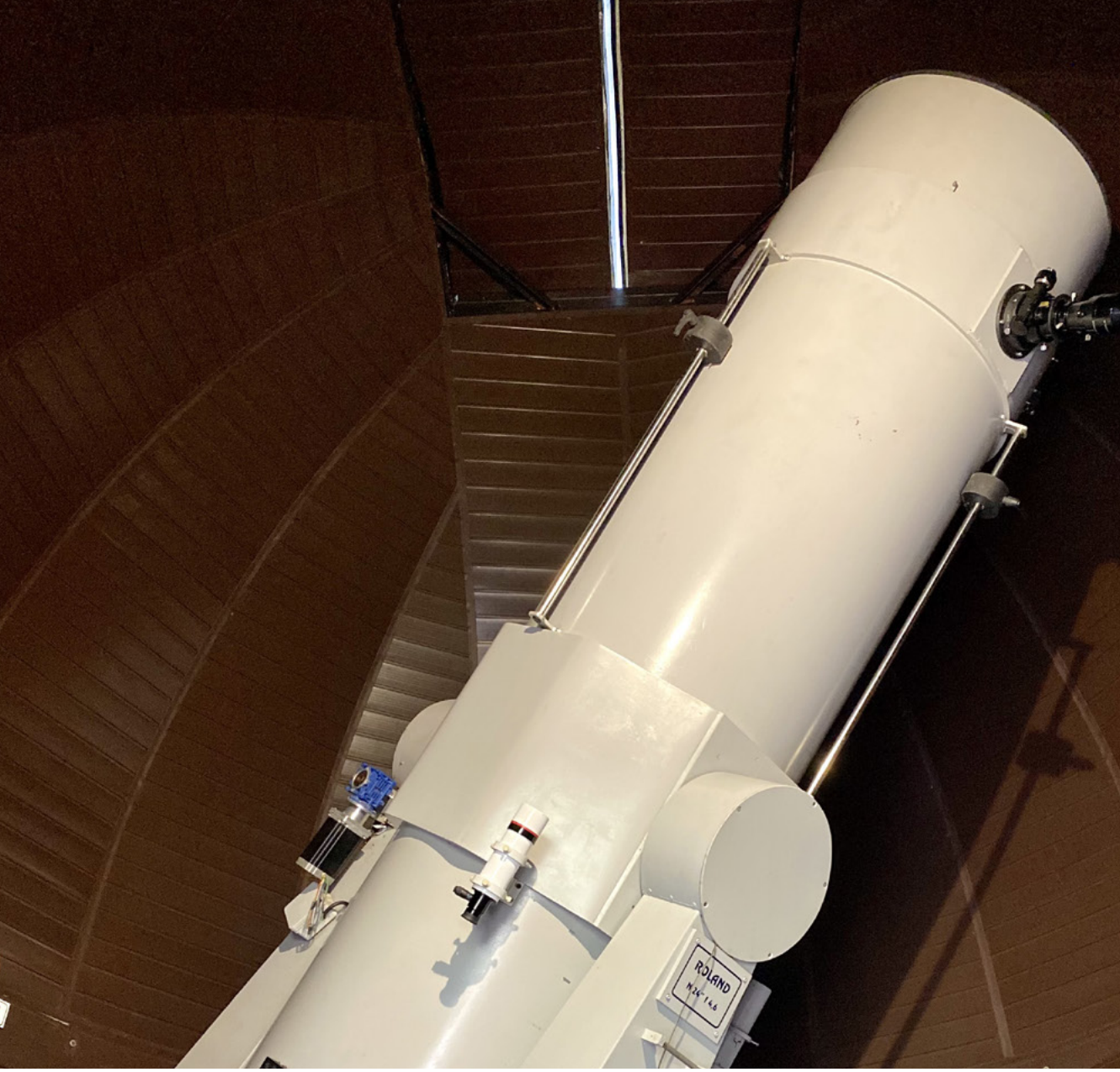

3. IN-DEPTH QUALITATIVE STUDIES OF *smart villages* – CONTEXTUALITY AND INTERTWINING OF THE INITIATIVES

3. In-depth qualitative studies of smart villages – contextuality and intertwining of the initiatives

3.1. Smart solutions in infrastructure and technology

3.1.1. Defining smart villages in the infrastructural/technological context

The modern world presents a number of challenges. One of them is to try to answer the question about what to do to make modern regions (villages), as well as the communities that inhabit them, more sustainable. In order to answer the question, it should be stressed that sustainability is inextricably linked with the 2030 Agenda for Sustainable Development. It defines 17 Sustainable Development Goals and 169 related targets, the implementation of which shall facilitate promotion of social well-being (United Nations, 2015). Challenges related to the development of technologies, including also communication and digital technologies, appear in nearly each of the Goals. The word "technology" has been used 53 times in the 40-page UN document, which highlights the importance of these changes to the whole world.

Technological development is strongly related to building resilient infrastructure, promoting sustainable industrialisation and fostering innovation, which are enshrined in Goal 9. Although infrastructural development is not strictly divided into two polarised sets of framework – rural and urban ones (Zavratnik et al., 2018), it seems that rural areas are – to a larger extent – forced to catch up in this field. By invoking an Indian example, Prajwala Srivatsa (2018) points out that those two dimensions must develop simultaneously while taking account of interconnections and interdependencies. This is an obvious conclusion, although it is not difficult to notice that in rural areas, this infrastructure in many aspects does not go beyond the satisfaction of essential needs – housing, technical infrastructure (supplies and sanitary infrastructure), communication and transportation. Thus, it seems not to be surprising to think that it is worth increasing pressure on the development, both qualitative and quantitative, of rural infrastructure, as it directly translates into the possibilities of economic initiative development. At the same time the development of infrastructure may be a decisive factor for the modernisation of agricultural production, development of settlements and environmental protection (cf. Dolata, Łuczka-Bakuła, 2005; Berkowska et al., 2010).

Although the Agenda does not make a division between rural and urban infrastructure, there is one derogation from this rule, namely particular attention is paid to rural infrastructure related to modern agriculture, development of technologies and banks of genetic plant and farm animal resources, in order to increase productivity of farms (the agricultural component is discussed in detail in Sub-section 3.3). Attention

is also drawn to those elements in the Rural Development Programme 2014-2020 (RDP 2014-2020), where one of the priorities is defined as fostering transfer of knowledge and innovation in rural areas. The Programme was designed to meet contemporary challenges faced by today's rural areas. EUR 100 billion was appropriated for support, enhancement and promotion of innovative and knowledge-based solutions to promote farming and/or rural development within the period concerned. In addition, conditions were created under the LEADER Programme to investigate local practices based on smart solutions.

However, local authorities should not only be interested in state-of-the-art technologies related to agriculture. They should also take into account those solutions which facilitate the development of local communities. Investment in modern technologies and infrastructure bring positive effects despite their relatively huge costs. No one needs to be convinced about the usefulness of a CCTV (Closed-Circuit Tele-Vision) system or a traffic management system in the city. Economic calculus is not necessary if the data collected point to a significant decrease in the number of crimes or traffic collisions and accidents (cf. Ilciów, 2017a). Do only urban dwellers benefit from such solutions? The answer to this question seems to be obvious. Also in case of rural investment one should ask some questions: are the benefits of a smart-type solution which exists in the village felt only by the residents of this village, or also by the inhabitants of the whole region? A positive answer to this question may make it easier to obtain funds for an initiative and facilitate co-funding of its actions in the long-term. If a particular investment is to benefit a broad group of recipients, the creation of such a group really does make sense.

It is worthwhile to underline that within the smart village concept, investments in infrastructure and technology are justified if they lead to the enhancement of the quality of life. At the same time it must be noted that the development of infrastructure or technology may, as a consequence, foster the development of local business, human capital, and lead to building civil society. The enhancement of the quality of life combined with personal development opportunities for young people may significantly increase people's willingness to stay and live in rural areas (cf. Matysiak, 2019; Sroka et al., 2019).

A key assumption behind the concept of smart villages (as in the concept of smart city) is that technological progress, if effectively integrated into other rural development initiatives, may create new opportunities for increasing income, providing services and reinforcing social potential, which significantly improves the quality of life in rural areas (van Gevelt, Holmes, 2015). Iwona Chomiak-Orsa and Paulina Szurant (2015) indicated that smart infrastructure in cities is treated as solutions which increase the mobility of urban processes and it is focused on smart transportation systems, digitalisation of public administration and advanced communication technologies. However, in the case of rural areas, it seems justified to complement those solutions with state-of-the-art technical and technological deve-

lopments, such as precision farming, digital platforms related to e-learning, e-health, e-administration, economy based on biotechnology, heat recovery systems, renewable energy, drones protecting remote fields against theft or controlling losses in crops, every day communication within the community, and also in external contacts. And as far as transport is concerned – they should be complemented with solutions related to sharing economy or original forms of mass transport (e.g. busses ordered by phone/text message).

It has been mentioned that the idea of smart villages requires the use of modern technologies. It does not mean, however, that it is *a sine qua non* condition. Very often technical solutions are replaced by the social aspect of innovation. At the same time, it is not the case that the more innovative solutions are applied, the more legitimate it is to define a village as smart. The purpose of using technologies is to improve the living conditions for the residents, and the selection of a particular solution must be conditional on ensuring care for sustainable and durable development of localities (Sikora-Fernandez, 2013; Ilciów, 2017b; Goryńska-Goldmann, 2019). It is worth underlining on this occasion that the technologies are a tool, and not a means in itself. This is evidenced by the initiatives described in Sub-section 3.2. It is important to emphasise that while the implications of technology are used in the discourse about smart communities, the technological and digital components of transformation are not the only ones, much less the most important in specific cases.

The following initiatives have been classified as technological and infrastructural solutions:

- the Entertainment and Sports Hall in Ryczywół, which uses environmental and energy efficient solutions,
- the barbecue hut with a meteorological station in Łuszczanów (Jarocin municipality),
- the proprietary system of crop irrigation based on rainwater and the passive green-house in the Agricultural Production Cooperative "Ostoja Natury" in Tomaszyn (Olszynek municipality), at the same time classified as agricultural and environmental solutions (described in Sub-section 3.3).

3.1.2. Reasons behind the initiatives implemented

There are various reasons behind the implementation of state-of-the-art technological solutions. One of them is a belief that residents of a small village deserve solutions which are available in cities. In Ryczywół, one of the teachers said that the construction of a new entertainment and sports hall was inspired by a feeling that "life in rural areas could be a mark of quality rather than of shame". The initiators noted that in the beginning the prime motives for using state-of-the-art technologies in the hall were those related to more favourable conditions for local youth and children attending the school to which the hall is adjacent, and finally also improvement of

living conditions of the whole rural community. In the case of Łuszczanów, beneficiaries of smart solutions were to be the students of the local school who were to use the meteorological station to develop their own competences, and in the case of the recreation and entertainment complex – the local community. According to the initiators of the Ryczywół hall, although its first purpose was to serve the children of the local school, it finally became the recreation and sports facility for the village residents as well as for the whole municipality. This is also attested by the residents, and – which is very important – by the local authorities. In the case of the operations of the Agricultural Production Cooperative "Ostoja Natury" in Tomaszyn, technological solutions and advance cropping systems were the elements without which organic production would be impossible. In addition, they accelerated business development.

One of the goals of developing various smart initiatives is the improvement of rural living standards, which is usually achieved. According to the residents of Łuszczanów as well as Ryczywół, the initiatives resulted in a range of leisure activities to choose from. One of the Ryczywół residents explains that "at last I can do something here, I can attend sports classes, which has not been so easy to find for people at my age earlier", and she adds that she "has become a fit lady at old age". Another one says that she does not need to go to Poznań to exercise. A Łuszczanów inhabitant is happy that "so much is going on here that I do not need to spend time watching telly". Those statements show unequivocally that the initiatives are an important factor improving the quality of life of those who decided to stay in rural areas. Unfortunately, there is no feeling that the initiatives are encouraging enough for young people to stay in rural areas or to return there after completing their education. The projects delivered are not a sufficiently strong argument for rural youth to come back to their home villages and start their careers there after graduating from tertiary schools located in cities. One of the Ryczywół residents pointed out that two of his three children preferred to stay in Poznań and pursue their careers there because "opportunities to get a good and desired job are greater in a big city". However, the pattern of thinking of the then big city dwellers who initiated the "Ostoja Natury" Cooperative in Tomaszyn was entirely different. They found a new way of pursuing their careers and building their private lives in the countryside, while producing organic food and developing the idea of a cooperative. However, they conclude, "not everybody has to want to manage each aspect of their lives in that way".

3.1.3. The way smart initiatives are implemented

The implementation of smart initiatives involves numerous problems. On the one hand – the problem of funding investments, on the other – a need to persuade local authorities as well as village/municipality residents that the initiative is important and necessary. The situation of the Ryczywół entertainment and sports hall may illustrate this. In this case the authorities did not need to be persuaded as the then head of the

municipality, Ms Renata Gembiak-Binkiewicz, was one of the initiators. However, some municipal council members and some residents were quite sceptical. Word spread that "the hall is too big, too expensive, maybe it is better to renovate the old hall which was located next to the planned new one".

The Ryczywół investment was supported with a preferential loan totalling PLN 1.8 million from the Provincial Fund of Environmental Protection and Water Management due to the application of environmentally friendly solutions. The hall was equipped with a ground heat exchanger, a system fully recuperating heat from used air, external blinds which react to the insolation level, a service water mixer that optimises energy consumption, a 1.5 meter-thick layer of special polystyrene preventing heat losses in winter and overheating in summer, a biomass-fuelled heating system using the same quantity of pellet as needed to heat two small detached houses, LED lighting. There are a lot of such solutions in the hall, which clearly shows the momentum but also the smart vision of the entire investment. The loan from the Environmental Protection Fund was not the only support. An amount of PLN 3.5 million was received from the Ministry of Sports and Tourism.

Obviously, not all the smart initiatives can boast such big support from central or local budgets. The funding is usually limited and consists of residents' private funds (as in the case of the "Ostoja Natury" Cooperative in Tomaszyn or the Mniszek initiatives), municipal funds or a limited *sołectwo* fund. The initiators very often sought funding by participating in competitions or applying for grants. This was the case of "Retrofitting Recreational and Educational Infrastructure by the Pond in Łuszczanów". Nearly half (PLN 60,000) of the entire sum of money came from various competitions, PLN 25,000 from the *sołectwo* fund and nearly PLN 30,000 from the municipal budget. The possibility of testing and applying advanced technologies does not need to be linked with significant expenses e.g. for a new tractor, seed drill or plastic tunnel. In the "Ostoja Natury" cooperative, a model of cooperation between the cooperative and business was created which allows for mutual benefits – the cooperative can use state-of-the-art agricultural machinery or new technologies while the company which makes its equipment available conducts tests, improves solutions or develops completely new ones and then markets them – "for these companies, this is very specific knowledge [...]. We are an implementation and reference farm for them" – the initiator says.

Although more limited funds were used for the Łuszczanów initiative, they also involved the application of innovative technological solutions. Next to the hut, a modern meteorological station was built, which monitors the environment and helps take preventive actions in case of climate change or extreme weather change (parameters measured: air temperature and humidity, pressure, precipitation, wind speed and direction, UV radiation and solar radiation, water temperature, ground temperature). The meteorological station is undoubtedly a novel, original and individual element, taking account of the public space in rural areas. Automatic measurements provide

access to environmental monitoring results for all the residents of the *sołectwo* by means of an internet link. The barbecue hut, in turn, is an element of infrastructure designed by contrast to the station – from traditional materials – thanks to which the area by the pond can be used all year round regardless of weather conditions. The hut is equipped with such innovative solutions as LED lighting and the electricity system powered by a photovoltaic module. A hybrid lamp is also a novel element. The lamp, as other infrastructure elements by the pond, is powered by renewable energy sources which, in addition to its financial importance, also has an educational value as it promotes the use of renewable energy sources in multiple applications.

3.1.4. Effects and sustainability of the smart initiatives implemented

It is worth pondering the sustainability of the initiatives implemented. A question arises: which of them stands the highest chance of achieving it? In case of infrastructural and technological solutions there doubtlessly is sustainability, however, in case of social initiatives it can be difficult to define which of them will be sustainable and which will last only for a short period of time. This is because there is no one definition of initiative sustainability. It could be said that sustainable initiatives are those the effects of which are visible not only during the initiative implementation, but also after it has ended. However, indicating the period provided in the EU projects seems to be unnecessary.

The sustainability of the projects implemented depends on many factors. One of them is whether the authorities are keen on maintaining its results. Authorities of all the localities notice advantages of the newly-established technological solutions but they also express doubts as to their maintenance in the future due to limited budgets. Introduction of expensive technologies in small localities is also criticised by some inhabitants. The biggest risk perceived by the respondents is the cost of infrastructure maintenance: "In general, a disadvantage of everything you build under civic initiatives is that it has to be maintained. The cost of repair is twice as big as the whole *sołectwo* budget"; this could be heard in one of the villages surveyed. The criticism results from limited funds as well as from fears of overinvesting. However, in the long-term, costly solutions may turn out to be capital saving. Investing in the recuperation system, as was the case in Ryczywół, helps decrease the heating costs (comparable with the cost of heating two houses). The students and their teacher we met pointed to the fact that there was little sense in providing many interesting solutions because there was no manager who could handle them.

With reference to Figure 1.1. in Section 1 it should not be forgotten that smart infrastructure is not only advanced technologies or complex systems, but first of all it is access to elementary tools such as a mobile phone network and internet connection. During the field studies it turned out paradoxically that smart solutions were identified in several localities where access to those networks is quite limited: "The obstacle

is that we do not have an optical fibre cable. [...] Here there is a cell tower which is our principal connection to the world". At the beginning of the section it has been mentioned that new technologies are not the overriding element of the smart village concept. However, in this case, a lack of them is a major constraint to enhancement of the quality of life, provision of online services, communicating, i.e. the other elements deemed key for the concept. It should be stressed, however, that poor quality internet connection and weaker digital networks have also become a driver for greater creativity in social activities.

3.1.5. Key resources

It is worth paying attention to the importance of optimisation of available and new resources in the context of possible investment (cf. Sikora-Fernandez, 2013). Their identification and appropriate management are essential for creating conditions for enhancing the quality of life of local communities while assuring the economic development of a given region (cf. Kozera-Kowalska, Kalinowski, 2016; cf. Lorentowicz et al., 2018; Pominek, 2018). Ricky W. Griffin (2004) identifies four types of resources: human, financial, material and information. An appropriate combination thereof is essential for rural development and pursuing smart solutions. It would be a cliche to say that – as every organisation of human beings – a municipality or a locality has certain resources. However, without appropriate identification thereof it is difficult to seek solutions in which a given village (locality) could have a comparative advantage. In the case of smart villages, each resource represents certain features (Komorowski, 2021):

- human resources – skills, know-how, competences, willingness to engage and predispositions of all rural residents and individuals potentially engaged in the development of the smart village concept,
- financial resources – funds which are used by a local community to finance various actions, including inter alia the *sołectwo* budget, grants, subsidies, any other external resources obtained,
- material resources – tangible resources including buildings, premises, any equipment that can be used for rural purposes,
- information resources – any usable data needed for an effective decision-making process, e.g. a group of residents on a social medium, an external advisor.

Key assets in each of the four categories were identified in the places surveyed, broken down into sub-categories (Figure 3.1.)

The interviews with the study participants show that mobilising each type of resource requires a different action. Human resources are the most difficult to mobilise but they are essential for any action. However, with every subsequent initiative in which residents and other stakeholders were involved, this resource became more and more consolidated and sustainable. It greatly facilitated the management of other resources, i.e. financial (acquisition of specialised knowledge, experience), material

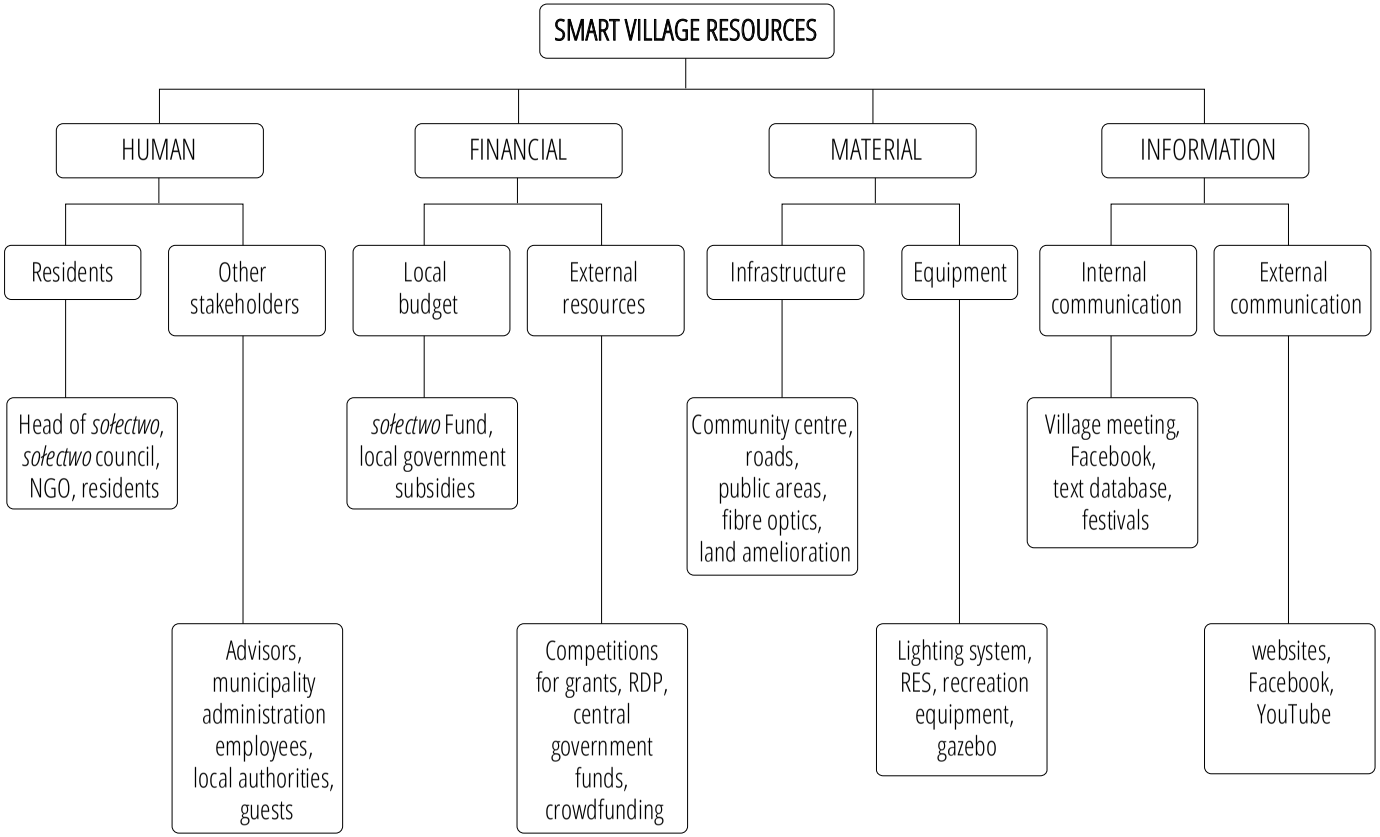

Figure 3.1. Smart village resources
Source: own work.

(purchase of pieces of equipment, better management of infrastructure, better technical facilities for new initiatives), information (an increasingly wide group of recipients, acceptance of new forms of communication, better visibility within the region).

The importance of human resources was stressed by the initiators in Łuszczanów. They recorded in detail a specific number of hours invested by particular individuals. They noted that twelve people were engaged in preparing the area for the hut assembly and the assembly as such. The number of man-hours needed to do the work amounted to 360. Work with the use of equipment for the assembly of the wooden structure, ground levelling and transportation of earth took 200 staff-hours.

Moreover, in 2018 the *sołectwo* residents participated in the project implementation by making excavations and preparing point foundations, assembling a wooden bridge and wooden landscaping elements (toilets, benches, bins) as well as making an excavation and placing the prefabricated sceptic tank for domestic sewage. Twelve people worked on the adjustment of the ground for assembly and assembly itself. The number of man-hours needed for the works done was 360. Additionally, it took 260 man-hours to carry out works with the use of equipment. Voluntary work of the residents (including the cost of the equipment use) was assessed at nearly PLN 34,000 (almost one fourth of the whole budget). Obviously, none of those working received this money, which shows the degree of local community engagement. One can wonder why there were so few people engaged. Relatively low engagement levels of inhabitants is noted by the initiators of other actions. One of them notices, however, that "although there are not many helpers, you can always count on a certain group of people. They will give you a hand even with the most bizarre action, regardless of whether it is cold and rainy or the sun shines and you'd rather sunbathe". It shows that the engagement of even a small group is vital for the success of an undertaking.

The residents of particular localities also point out that they are not sufficiently engaged in local actions. One of the Ryczywół inhabitants said that he had been unable to participate in initiative planning, but added that "people want to act and someone has to make it possible for them". Another Ryczywół resident argued that the initiators "forget about us at every stage", adding that "the construction of the hall gave an impulse for greater sports activity among the villagers". One of the neighbouring village dwellers did not hear about the Łuszczanów initiative, however, when persuaded to visit the site, she called back after several days to say that she "wishes she were able to participate because it is a very interesting proposal and other villages should learn how to do the right thing in their locality". This is a clear signal for other initiators to engage the residents. However, how can their engagement be increased? And how can they be encouraged to take action? It is possible that the willingness to be engaged is only declarative, but greater engagement is a guarantee of enhancing the quality of life in the village, looking for new ideas, and above all – of the integration of the local community. It is worth mentioning that among the residents we met, regardless of the village, there were also those who did not feel the need to increase their own

activity for the benefit of local initiatives, justifying it with the lack of time or shifting the responsibility onto others.

Although the human factor is of primary importance in all types of initiatives (cf. Pomianek, Kowalczyk, 2016; Wojciechowska-Solis, Soroka, 2017; Kamiński, Leśniak, 2019), in case of capital-intensive big infrastructural projects it is the capital accumulated which constitutes a vital part of the resources. It conditions the scope of works to be funded. Without external support, including subsidies from business entities, individuals as well as from the state, the implementation of the projects would be impossible. This is acknowledged by the initiators of the projects discussed. How significant those financial amounts can be is noted by Dr Paweł Grabowski – the initiator of the day-care Prophet Elijah Hospice which provides 24-hour palliative care for the terminally ill. He points out that the whole investment requires a minimum of PLN 13 million.

Human and financial capital is complemented by material capital, which was available to Ryczywół as well as Łuszczanów. Good cooperation with the managers of the areas in which the initiatives were launched enabled the development of projects without additional financial burden.

3.2. Smart solutions in the social sphere

3.2.1. Defining smart villages in the social context

As has already been mentioned, although modern technologies are very important in the discourse on smart solutions, they are a tool for enhancing the quality of life rather than a goal in themselves. Digital technologies and social innovation have an impact on the life of an individual, a family and entire local communities. They support the enhancement of the quality of life and they improve access to public services provided for the community and, as Fabrizio Barca (2009) puts it, they influence better use of territorial resources. One cannot disagree with that – smart solutions using those technologies undoubtedly facilitate the lives of local communities by offering e.g. e-services, e-health, transport, e-administration, rural tourism based on smart solutions. In order, however, to be able to make use of these solutions, it is necessary for rural inhabitants to acquire new competences and knowledge. This will enable meeting new challenges faced by digital societies.

In practice it has turned out that in order to ensure residents a better living space, it is necessary to apply modern technologies. Some villages still lack basic infrastructure (roads, sewage system), a reliable power grid, school or access to a doctor, or – which seems to be indispensable – adequate quality of the internet connection. In their case the challenges of enhancing quality of life can be met by actions and initiatives of a social character. Thus, what type of smart services can prevent e.g. communication exclusion? Specific geographic conditions, financial and natural resources as well as the socio-cultural structure have immense influence on smart initiatives which

can be undertaken in a given area. This is why the term 'smart villages' does not have a universal meaning in the social context. Difficulties encountered by particular communities are different, as are the problems they have to address. The concept of smart villages does not offer universal solutions in the social context, and the meaning of 'smart' in this context is broader and does not include digital technologies only.

In smart solutions in rural areas, social capital, which plays a key role as a creator (initiator) of ongoing changes in rural development, is of particular importance. In the literature we can find the opinion that the accumulation of social and human capital and good infrastructure influences the innovative character of the economy[1].

Social capital – as opposed to human capital – is a public good, has a collective nature and forms the basis of civil society, characterised by its members' self-consciousness of community needs and the pursuit of the satisfaction thereof. A high level of social capital results in taking joint actions in order to improve the community's living conditions, which in the economic dimension translates into easier negotiations, lower transaction costs, spread of knowledge and the development of civil institutions (the third sector) in the context of controlling public authorities. It also fosters long-term investment (Fukuyama, 1997; Fukuyama, 2003). It can be concluded that investment in skills and competencies will result in an improvement of the quality of human capital in rural areas, and as a result, in the long term, will foster development of these rural aeras through the emergence of new ideas and initiatives. It can be assumed, in accordance with Robert Putnam et al. (1995), that improving the quality of social capital fosters greater efficiency of local communities by facilitating coordination of actions. At the same time it enables achievement of certain goals which cannot be pursued without its participation. Putnam came to the conclusion that "any group of people that places extensive trust in one another accomplishes much more than a comparable group lacking that trust and trustworthiness". By giving an example of farmers he points out that where "the farmer is helped by others to stack hay and where tools are commonly borrowed, social capital allows each farmer to do his work with less physical capital in the form of tools and equipment". This shows an important position of the leader within a local community who – if trusted by the villagers – can be the basic factor behind initiating actions (cf. Bourdieu, 1986).

According to Antoni Kukliński (2003), social capital extends the ability to pursue collective actions for the achievement of mutual benefits, it is a key element of creating, diffusing and transforming knowledge and it is particularly important for regional development (it is vital for innovation and competitiveness). Human capital, in turn, decides about the development potential of society and the economy and contributes to social well-being (Jakubowska, Rosa, 2014), which fits ideally into the concept of smart villages.

[1] Both concepts are present in academic and social debates. The term 'social capital' is used by sociologists and policy experts, while "human capital" is more often used by economists.

"Human capital" is a well-known term, which is often used in public debate especially by politicians who want to underline the relationship between developing and spreading new knowledge and keeping a high level of social development (Hartog, Maasen van den Brink, 2007). As underlined by James Heckman (2001), a Nobel Prize winner in economics in 2000, the "new economy is based on qualifications and skills [...]. We know that proper use of new technologies requires a high level of qualifications. Those qualifications is human capital which brings invaluable benefits [...]. The bigger human capital, the easier it is for workers to adjust to changes, to acquire new knowledge and to think creatively. Not only individuals can benefit from human capital, but also whole societies". Also with regard to a local community, those words will not be cliches – a higher level of human capital development will foster greater mobilisation, looking for creative solutions, and first and foremost – creating actions aimed to improve the living conditions of local communities.

The condition for high quality and value of human capital is the ability to use it effectively (Michalczyk, Musioł, 2008; Kotarski, 2013). A lack of practical application of knowledge and skills possessed by a given individual, as well as a passive attitude and lack of involvement in social issues lower its quality. Especially in this time of globalisation and of a knowledge-based economy, a major role in implementing smart solutions in rural areas in the social sphere is played by institutions, but first of by all the local leaders who can mobilise people in the community to take action that affects their quality of life. Such actions include:

- an innovative project of a rural home hospice (in collaboration with family and relatives) operating in the area of five municipalities and two counties of Podlaskie province (Narew, Narewka, Michałowo, Gródek, Zabłudów),
- the Astronomical, Cultural and Educational Centre in Niedźwiady (Szubin municipality),
- an educational workshop for children in Rzeczenica,
- an environmentally friendly "Bookworm's Bench" in Rzeczenica and an open-air library in an antique telephone booth in Piaseczna Górka (as a promotion of the bookcrossing idea),
- initiatives implemented in Mniszek, Dragacz municipality (integration and education),
- cultural projects carried out at Plecionka Association in Magnuszew municipality (i.a. artistic workshop for youth, film production, other creative activities),
- creation of a mural (with strong participation of the residents of Wiązownica-Kolonia) on a neglected building of the old dairy in Staszów municipality,
- an information and consultation blog run by the head of Wiązownica-Kolonia; database of residents' mobile phone numbers to contact them by text messages; other initiatives related to communication with the inhabitants (e.g. in Piaseczna Górka, Morawica municipality, Mniszek municipality).

As noted by one of the initiators of the aforementioned projects, "the multidimensionality of the smart village idea gives ample room for its application, especially in rural areas". Many villages implement technological solutions on a greater or smaller scale, which in the social context are often related to education and workshops for children and adults alike. This can be illustrated with the example of the construction of infrastructure for observing the sky at the Niedźwiady Astronomical, Cultural and Educational Centre (Szubin municipality). This is the biggest amateur astronomical observatory in Poland, run by the "Local Group" Pałucko-Pomorskie Astronomical and Environmental Association. The actions prepared by the Centre focus primarily on increasing educational levels by implementing projects focused on supporting students with special developmental and educational needs in the framework of specialised or remedial classes. The local leader from another village noted during an interview that she always "cared for the residents acquiring new skills, receiving training and getting to know their value, to be inspired by examples and good practices from all across Poland, and to be able to use the acquired skills in practice as well as to improve the quality of life in rural areas". Her intention was to improve the competences of rural inhabitants and although new technology was not used in all the projects implemented, all of the projects were smart, in the inhabitants' view.

In another municipality, smart solutions in the social context included the workshop in mechatronics for primary school students of sixth to eighth grades and an environmentally friendly "Bookworm's Bench" which, in the initiators' opinion, is a cultural element that integrates the local community. It will also be innovative because there is a plan to develop an app for borrowing books (to be designed especially for that municipality).

There are areas in Poland where actions taken by the residents are identified as smart although they do not make use of new technologies. Can we regard as smart such initiatives for local communities, which aim at ensuring the best possible living space but do not make use of advanced IT or telecommunications solutions? The analysis of information gathered during the interviews shows that such initiatives are most often related to people. They include e.g. workshops or providing palliative care for chronically and terminally ill patients. In the opinion of the authors of this publication, **a number of social initiatives deserve to be called smart despite their not making use, or making little use, of digital and communication technologies**. The project of the Prophet Elijah Hospice Foundation is such a smart initiative. It is unique in Poland and in Polish rural areas. Medical staff of the Foundation help in nursing patients at home. A doctor visits a patient on average twice a month, and a nurse – twice a week. A physiotherapist, a psychologist or nutritionist visit patients as necessary. According to the initiators: "We provide customised care – we have a team of qualified caregivers, who can drive a car and who visit patients or help patients' families provide 24h nursing care. If patients have no family to care for them, the

caregivers help patients in everyday care and life. Sometimes they simply have a brief conversation with a lonely patient."

Although the Hospice project lacks digital and communication solutions, social innovation can be seen there. A new concept of treating and supporting terminally ill patients fits into the definition by Terry Flew et al. (2008) or James A. Phills et al. (2008). The solutions used to solve a social problem – in this case providing direct support to the terminally ill and indirect support to their families – contributes to ensuring sustainable social value, the benefits of which are enjoyed not only by the patients themselves, but also by the local community. In the case of the Hospice, the solutions applied are more efficient and durable, and according to the staff – also more equitable. One of the nurses says that "such a solution works in 200%". Thanks to the Hospice "we have overcome a transport constraint and patients have better access to healthcare", adds another respondent. The scale of collaboration with the local social welfare centre is also innovative, which is stressed by the managers of the centres at Narewka and Michałowo.

The residents of one of the small villages stressed, when interviewed, that a "smart village means a more conscious village" and that they had "the power and determination to become a smart village only thanks to their own strength, skills and knowledge". From that point of view investing in human capital seems to be a good solution which will bring benefits in the future. One of the leaders of the villages surveyed underlined that aspect, saying that "a smart village is a village of cooperation"; another leader added that "it is a village which is wise with the wisdom of generations". Due to the lack of trust and the fact that the residents lock themselves up at home and are not very much involved in social affairs, in many cases it is not easy to achieve cooperation. Although some respondents had never heard the term 'smart village' before, some of them could intuitively say what it might mean. For example, the head of one municipality said that such a village "will be exceptional in a sense, it will be developing and participating in electronic and media evolution, it will promote itself better and it will reach people not only directly but also through electronic media". However, it is worth remembering to adapt information channels to a given environment, i.e. to reach the residents (most often the elderly) in a traditional, analogue way, which was noticed by the initiator from Staszów municipality, who was simultaneously running a few information channels, namely a blog and a Facebook fan page on the internet, sending texts by phone as well as distributing information on paper leaflets.

3.2.2. Reasons behind the initiatives implemented

As the problems faced by the local communities were different, so were the reasons behind the projects implemented in the social context. The analysis of information gathered from the interviews shows that the main reason for taking action was to align the standard of living of rural residents with that of urban dwellers. Moreover,

most projects were the consequence of the needs communicated by the residents. Before starting the project, an analysis of the resources available to the municipality was carried out.

The reason behind the Prophet Elijah Hospice was the mission (helping people at the end of their lives) of the chief initiator, Dr Paweł Grabowski. He moved from Warsaw to the east of Poland with a feeling that it was worth doing something for other people. In the beginning the Foundation was called the Podlaskie Cancer Hospice Foundation. The Foundation was based in Nowa Wola near Michałowo. From the very beginning (2009) the Hospice has been operating on a non-for-profit basis. The organisation takes care of adults and, as pointed out by one nurse: "members of our medical team – doctors, nurses, physiotherapists, a psychologist, nutritionist and caregivers support families in nursing the patients. We educate them and provide advice so that the persons who take care of their loved ones in the last stage of life know how to face new reality". The feeling that the system offering specialised hospice and palliative care in rural areas is insufficient reinforced the will of a wider circle of people to engage in the project.

In turn, the purpose of the actions taken in Mniszek was to integrate the residents, to mobilise adults and initiate inter-generational cooperation. They were addressed primarily to rural inhabitants, to show them "the light in the tunnel". The initiators underlined that they wanted to "show not only the world seen through a keyhole, limited to narrow surroundings". The following activities, inter alia, were carried out: a workshop aimed at preventing digital exclusion of the 50+ generation, "Grandparents to Grandchildren – History that Surrounds Us", "I am from Kociewie", including the Cultural Ethno Design Ferment – the use of folklore in decorative arts and designing clothes, "Our Unknown Neighbours" – workshops during which young people learn new skills from their neighbours. A similar situation was observed with regard to cultural actions in Magnuszew municipality, targeted primarily to youth. The projects directly respond to the challenges of ageing villages and can provide ideas for improving social cohesion for other municipalities.

The initiators of actions in Rzeczenica based their idea for municipal development on the use of art and state-of-the-art technologies. Their intention was to facilitate life in the village "by making it a modern place", while retaining the unique charm and atmosphere of the locality, where "one can find zones free from network coverage and be 'in life', and not only 'online'". In this case, the initiators diagnosed that the municipality was full of skilful children with great potential, who were forgotten. An idea was conceived of a workshop during which children work on Arduino Uno sets while preparing smart elements.

The idea behind establishing the Astronomical, Cultural and Educational Centre in Niedźwiady was to implement social and economic projects. The undertaking contributed to raising awareness of the residents and mobilising them to take actions which influence growth of local entrepreneurship. The problems diagnosed within the municipality led to planning the implementation of the following social projects:

1. Youth Club, "Closer to the Stars", which involves activities for children and youth (including those from families at risk of poverty or social exclusion), designed to increase educational levels; the solutions will be implemented by conducting classes and workshops aimed at developing hobbies related to science (physics, astronomy); the project is under implementation,
2. "Key Competences – a Way to Success" – action supporting the choice of sciences-oriented path of education.

During the meetings the initiators paid attention to the complicated procedures for obtaining funds from EU projects, which sometimes discourage them from applying for those funds.

3.2.3. The way the smart initiatives are implemented

In the case of the initiatives examined in the social context, it should be underlined that almost all of them started from diagnosing the needs. Chances for success of the initiatives were considered at later stages, followed by seeking funding. Not all plans could be implemented – the pandemic and the lockdown restrictions halted some of them.

Very often projects were implemented 'in small steps' in cooperation with volunteers. In the case of Mniszek and Magnuszew each subsequent project was the continuation of the previous one. There were cases of money being raised among residents. Examples from Mniszek (including the Facebook fan page) and Wiązownica-Kolonia (where a mural was painted, where the head of the village writes a blog, and where a number of social, cultural and educational events take place) show that a wise leader is key to the success of the undertakings, although, as was repeatedly emphasised in many localities, "the head of the village can do as much as the village will help him to do".

The establishment of the Prophet Elijah Hospice in Michałowo municipality was the consequence of changes in the career of the initiator who initially moved from Kraków to Warsaw, and then was looking for "white spaces" where there were no hospices and where such support was really necessary. The feeling that "people are more important than procedures" made him find great courage for his actions. Although the initiator mentioned that "at the beginning it was a knee-deep stroll in concrete", he knew that this work was important. Positive effects of the actions to date contributed to conceiving another idea – a hospice building which has been under construction for several years now, and which will serve more ill and dying people in the future. As the initiator points out: "in the building there will be room for having family dinner together, prepared by other people in the room next door, so that everybody can sit at one table just as they used to do in the past". In addition to the focus on close relations among patients and staff, the building will also have a room with hydro-massage, a rehabilitation room, therapeutic rooms and meeting rooms.

An important role in all these projects is played by not only the initiators themselves but also (and perhaps first of all) by the local governments and local authorities. Their role is to enable the use of rural inhabitants' potential, a good example of which is the Astronomical, Cultural and Educational Centre and the support from the municipality to the Art Corner Foundation (for measures taken by it). The Centre is organised in the former primary school building (the school ceased its activity in 2020), located far away from other houses. Astronomy enthusiasts, appreciating the location of the building (far away from village lights and characterised by relatively low annual rainfall), applied to Szubin's municipal authorities for the transfer of the building and part of the surrounding area to set up a permanent observatory facility there. The project involved alteration of the building and, to a limited extent, extension of its upper part in order to adjust it to the needs of its users as well as to current technical and building regulations. The scope of the project included:

a) construction works – demolition works, building walls and doing concrete works,
b) renovation of the roof,
c) replacement of window and door frames,
d) renovation of the facade,
e) sanitary engineering and electricity works.

Thanks to the favourable approach of the municipal authorities, the old school building was refurbished and the necessary equipment was purchased, which made this place nice and cosy. Also in Magnuszew municipality, in the locality of Przewóz Tarnowski, a community centre renovated and newly equipped (by its users with e.g. a huge TV set, PlayStation), encourages youth to take part in various activities.

3.2.4. Effects and sustainability of the initiatives

Establishing the local community identity is very important especially at the time of the internet, when people remain locked up in their houses, often situated far away from one another in rural areas. The initiatives implemented in the social context were integrative, cultural and educational in nature. They also influenced improvement of the competencies of people who took part in them and contributed to mobilising the residents to do things together. Since the local leaders realise the importance of collaboration for the local community, some of the actions were aimed at integration. It can differ in character, e.g. formal, training, leisure. The leaders often make use of solutions that combine work and knowledge with fun (e.g. while painting the mural in Wiązownica-Kolonia, which was done by many people). Sometimes it can be done with little funds, but with a huge motivation for action. It is also difficult to unequivocally define a degree of residents' engagement in actions taken in the village because the engagement depends of the character of initiatives. However, as underlined by some initiators, there is a well-established group of people who are very willing to participate in the preparation and then implementation of the initiative. Another initiator added

that the aim was to "reach people who want to develop, who want to do something in their leisure time, and there are more and more such people". It is not always easy to gather people around an idea or vision to be implemented (usually) by a narrow group of initiators. It was noticed by one of the inhabitants of Staszów municipality who explained that even if they supported some idea, it was often up to the moment when something must be done. Afterwards, only a certain permanent group of people was engaged. It is best described by the initiator from that municipality who – after sending a text message to 160 residents inviting them to, e.g. the festival commemorating the locality's 800th anniversary, and asking them for support in various activities – always got responses from the same group of people. The initiator sees the reasons for that in the anonymity of this type of contact (a text message does not influence people's behaviours as much as personal contact when it is harder to refuse to do something).

There is a strong feeling in the Prophet Elijah Hospice that "as a small unit located far away in a peripheral area we are too weak to be heard (though it sometimes happens), but especially to be heard as the voice of people who themselves are not able to demand their rights or organise spectacular protests. These are terminally ill people, dependent ones, living in remote villages far away from small and large urban centres". At the same time the initiators point to the fact that, for the time being, they do not have influence on the amendment of the law aimed at enabling the ill better access to professional care at the end of their lives. They add that because of that "we have decided to change the reality that is closest to us – by implementing and testing innovations at our hospice, in order to provide a new model of a hospice in a rural area. And we have succeeded – it is less costly and more effective".

Can we take it for granted that the social solutions are sustainable? It seems that as they lead to the enhancement of the quality of life, foster a greater sense of empowerment or enable the local community to acquire new competencies and skills, it can be said they really are sustainable.

3.2.5. Key resources

Human, physical and financial resources were necessary to implement the Astronomical, Cultural and Educational Centre initiative. The resources were obtained by submitting the project, which was carried out under the Regional Operational Programme of Kujawsko-Pomorskie province for the period 2014-2020 (*Priority Axis 7 Community-Led Local Development*). The entire cost of project implementation was PLN 1,848,870.37, of which the co-funding obtained by Szubin municipality amounted to PLN 1,394,546.37. In this case, a key resource is also the unique knowledge of the members of Pałucko-Pomorskie Astronomical and Environmental Association, "Local Group", in Niedźwiady. The Association organises National Meetings of Astronomy Enthusiasts (OZMA) at which it shares its knowledge. Moreover, it has the biggest telescope on parallactic mount in Poland (603 mm in diameter and

2802 mm in focal length). Thanks to the telescope, celestial objects thousands of light years distant from the Earth may be observed. The observatory is also equipped with telescopes with a diameter of 250 mm and 400 mm as well as devices enabling the observation of the sun.

As pointed out by the Head of Wiązownica-Kolonia, based on the projects engaging people in actions (e.g. designing the mural), it is very important, first, to know your village resources and, second, to appreciate every help from the residents. It should be manifested by a rhetoric used within information channels ("this is our collective idea" instead of "this is my idea") or official thanks to particular individuals expressed in public (motivation to further actions for them and for other people).

In the case of the Art Corner Foundation two hobbyists combined forces and engagement to conceive an idea of municipal development through the use of art and new technologies. In order to carry out the actions planned, the initiators needed funds as well as human resources, i.e. their own knowledge. Thanks to good cooperation with the head of the municipality they received not only the necessary funds and materials (wood to construct the "Bookworm's Bench") but also the area by the lake where they conduct open-air classes for children. Sometimes they finance their ideas on their own (e.g. an app for borrowing books), and sometimes they raise funds by participating in various competitions.

The importance of human resources, and especially the sense of mission, can be best observed on the example of the home hospice's activity. This is acknowledged by the Foundation's motto: "Out of Respect for Life". A lack of necessary funds somehow prompted smart developments in the social area. It was necessary to use the resources to the maximum, so that the effects would be satisfactory. The respondents point out that "now people from other regions of Poland are asking us how we have done that, we have become the forerunners of such solutions". The Hospice staff underline the significance of a good atmosphere within the team. Besides, the Hospice activity also shows how important financial support is for particular actions. Although the initiative generates lower costs than operations carried out in a dedicated building, funds are necessary to maintain office space, a storage room for equipment (to be lent to the ill), or for fuel. Those funds are partially obtained by donations from people of good will, but also from the National Health Fund.

The initiatives under the project: "Don't chatter, just do it. Rural actions – urban inspirations" show the actions of the head of the village who first diagnosed the local potential, looked for collaborators to collectively identify its important elements, including historical ones, to use them later in the educational process. As the leaders emphasise, the first thing done by the residents was "a journey into the past and the establishment of a database of the resources we have". The resources included:

- location (in the forest in the area of the Complex of Landscape Parks by the Lower Vistula River, where investment sites are located, close to the A1 and S5 highways; at a distance of 12 km from the towns of Świecie and Grudziądz),

- natural resources (streams, rivers, forests),
- historical heritage,
- cultural heritage,
- residents' potential and skills.

Funds for project implementation were collected from very different sources. The main objective was to obtain external funding and to take part in competitions for grants in order to "make the village vibrant and thriving and to live better". External sources of funding the project included inter alia: the Rural Development Foundation, the Marshall's Office, the Civic Initiatives Fund, the BGK Bank Foundation. Thanks to the determination in obtaining external funds and carrying out actions, it was possible to implement subsequent initiatives. According to the leaders "what we achieved within eight years was possible thanks to the engagement and incredible activity of the residents".

In the case of the projects analysed, funds were also provided thanks to permanent cooperation with non-governmental organisations, such as the Programme "Equal Opportunities" of the Polish-American Freedom Foundation, from which the residents of Magnuszew municipality benefitted through the involvement of the Plecionka Association.

3.3. Smart solutions in the environment and agriculture

3.3.1. Defining smart villages in the environmental and agricultural context

As has been mentioned above, the smart village concept has many references to the concept of sustainable development, in terms of theory (cf. Visvizi, Lytras, 2018; Mohanty et al., 2020)**, empirical aspects** (cf. Vaishar, Šťastná, 2019; Adamowicz, Zwolińska-Ligaj, 2020; Śmiglak-Krajewska, Wojciechowska-Solis, 2020) **as well as in programming documents prepared by European and national institutions** (cf. ENRD, 2018b; Polish Ministry of Agriculture and Rural Development, 2020). As regards the approach to smart development and sustainable development, a compromise is sought between environmental, economic and social goals, which can be reached through appropriate measures aimed at (Komorowski, Stanny, 2020):

- enhancement of the quality of life of residents (social order),
- optimisation of the current economic benefits of households, enterprises and local authorities (economic order),
- permanent protection of the environment and landscape (environmental order).

The item concerning the environmental order has recently been high on the agenda, especially in light of the new EU development strategy – European Green Deal (EGD), which is designed to "transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is de-

coupled from resource use" (European Commission, 2019). An important element of the EGD is agriculture responsible for protection of ecosystems and an environmentally friendly food production system. Interdependence between farming and the state of the natural environment is a frequent topic of scientific research (cf. Pawlak, 2015; Poczta, Sadowski, 2018). Many EU programmes aim at encouraging farmers to – as defined by Tomasz Wojewodzic and Paweł Zadrożny (2017) – "become a conservationist and guardian of the natural environment". Moreover, organic farming may be a factor influencing local development in many aspects (including the environmental one), provided that farmers are well organised and consolidated locally (Jasiński et al., 2017; Dudek et al., 2019; Dudek, Wrzaszcz, 2020; Łuczka, Kalinowski, 2020).

The UN Intergovernmental Panel on Climate Change raises the alarm in its new report "Climate Change: 2021: The Physical Science Basis" (IPPC, 2021) that some effects of man-made climate change have become irreversible. The average air temperature between 2010-2019 was over one degree Celsius higher than that between 1850-1900 (when industry was only developing), which, on the scale of climate change, is a quite significant difference. In the following years such extreme phenomena as draughts, floods, fires, hurricanes will probably gain in strength. Their catastrophic effects could already be observed in 2021. It seems that taking account of the environment we live in has become a necessity – while thinking of counteracting further deepening of the climate crisis and its potential effects. According to the slogan "Think globally, act locally", care of the environment should underpin projects implemented at the lowest possible territorial levels.

In view of the above, one may be tempted to say that smart actions should contribute to greater sustainability of the area in which they are implemented. In the municipalities under study the following solutions were used as examples:

- the pro-environmental projects related to the protection of air, soil, water, flora and fauna, e.g. irrigation systems based on rainwater, a passive greenhouse, use of solar panels and water turbines, establishment of a rain garden, natural insect deterrence; these solutions were identified in Piaseczna Górka (Morawica municipality) and Tomaszyn (Olsztynek municipality),
- the agricultural production cooperative (RSP) as a system of innovative solutions; the "Ostoja Natury" RSP operating in the municipality of Olsztynek,
- year-round production of high quality food (including organic) and its sale through the sales platform (in physical and online stores), as one of the elements of "Ostoja Natury" activity,
- the pro-environmental solutions in the sports and entertainment hall in Ryczywół (as already described extensively in Sub-section 3.1. – the system fully recuperating heat from used air, external blinds that react automatically to the insolation level, service water mixer that optimises energy consumption and other environmentally friendly solutions),

- the station for meteorological measurements in Łuszczanów used to monitor the environment as well as to take adaptation and prevention measures with regard to climate change and extreme phenomena (measured parameters: air temperature and humidity, pressure, precipitation, wind speed and direction, UV radiation and solar radiation, water temperature, ground temperature – also broadly described in Sub-section 3.1),
- educational workshops for the residents of Mniszek, during which they learned about environmental protection.

It is possible to notice, in the way the respondents understand the concept of smart villages, the emphasis on respecting the environment, counteracting climate change and striking a balance between economic, social and environmental issues. For one of the respondents from the local government group, smart action is "a local, civic initiative, bringing together creative people who want to achieve certain place-dependent goals – these small places focus on micro needs". According to the responses of other respondents, satisfying these needs should take into account all groups of residents (regardless of age, occupation, tastes, etc.) as well as the benefits for future residents. These opinions are to a large extent consistent with the definition of sustainable development, i.e. development which "meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987).

A different point of view was presented by the initiator linked to organic farming. He considers smart villages as "a system open to connection from all sides, i.e. the one that you can enter, be a participant in, cooperate with, be its beneficiary, its customer". Following the PWN dictionary, a 'system' is "an arrangement of elements having a definite structure and constituting a logically arranged whole". Such an understanding emphasises the holistic approach to the smart village concept which – when translated into the language of practice – means that the implementation of initiatives should not be detached from the vision or long-term development strategy of a given entity. In addition, each subsequent (or parallel) initiative should create a logical sequence and attain a specific goal. The system does not have a specific capacity, and it can be created by different kinds of entities (e.g. administrative units, NGOs, other types of organisations), which can respond in a flexible way to the current needs of its associated members. The impact of the system may also vary depending on whether we deal with a microsystem or a comprehensive system.

3.3.2. Reasons behind the initiatives implemented

The rural residents notice environmental problems in the surrounding area, which often directly negatively affect their lives (e.g. regular flooding). At other times it is an expression of care for the environment, environmental awareness or an adopted vision of development to achieve a specific goal.

The pragmatic approach can be seen when single projects are implemented to solve a specific problem. This was the case with the rain garden in Piaseczna Górka, which was created on a public plot of land flooded regularly by snowmelt and rainwater. The problem had existed for years but was not noticed by the local leaders or residents (no need to solve it). It was only after gradual development of the surroundings of the plot, i.e. the construction of playgrounds or a gazebo, that the problem became real for the local community. It was important to identify the source of the problem (answer to the question: why is this area flooded?), as well as to ensure the availability of external funding to resolve it.

A similar pattern was observed in the case of the installation of solar-powered lighting in the village recreation centre. The need emerged only after the construction of recreational and sports infrastructure and other accompanying facilities, intensively used by the residents. The need to ensure safety and to enable the use of the common space for as long as possible contributed to the purchase of the lamps. Because of the high environmental awareness of the local leaders and economic considerations (lowering maintenance costs), renewable power supply was considered as the most reasonable. Pragmatism also dominated in other initiatives in Łuszczanów and Ryczywół – environmental aspects were the consequence of the feeling that it was worth investing in more expensive solutions, in order to reduce the maintenance costs in the future, and as one of the initiators said "if it is beneficial for the environment, than it's all the better".

The specific nature of a particular place is an important driver for developing a smart initiative. Location in a suburban area is associated with an influx of people from cities, who bring with them certain behavioural patterns and therefore have higher demands on how the place they live in should look. The research shows that it is the incoming people (the so called gentrifiers) who become the initiators of many local projects (Zwęglinska-Gałecka, 2019). The phenomenon was observed in Piaseczna Górka – a 'dormitory village' of Kielce: "incoming people are more demanding and have more ideas than local people". Of decisive importance is their age (generation of 30-40-year-olds), university-level education, a great deal of creativity and a willingness to design their ideal place to live. Another respondent noticed that "today a hard-working person who comes home would like to feel some kind of satisfaction. Finding your place to live makes you feel deep inside that you are at the right place at the right time – I mean a psycho-social comfort".

The operation of the "Ostoja Natury" Agricultural Production Cooperative is an example of a comprehensive approach to pursuing a vision of development in all domains of life. As its initiator puts it, its mission is "to produce organic food in an innovative way", which is a reflection of a certain life style as well as an opportunity to gain economic benefits due to a growing consumer interest in organic food. Such an attitude may be a certain form of benchmarking for potential followers in other regions of Poland. It has to be underlined, however, that simple copying of ideas without a look into local conditions and resources might not be as successful as in the above mentioned example.

3.3.3. The way the smart initiatives are implemented

The respondents repeatedly highlighted in unison that the key to undertaking a given initiative is social acceptance involving information channelled in various ways (through mass media, information boards, text messages) and making the inhabitants join the initiative at different stages of its implementation. The majority of actions require consent from the local authorities who are owners of a certain plot of land or a building, and in many cases a lack of consent means giving up the planned undertaking. However, such situations were very rare in the localities under study.

One of the initiators underlines that their aim was to respond to the needs of our times, i.e. food production, attitude to it, building a community around the issue rather than to create a smart village. He admits that although a number of solutions is of smart nature, the whole is something more than the concept can offer: "the system works in a very simple way – when we needed a place for distribution and sales, and there was no such place, we created it ourselves". This was, however, preceded by market research and numerous preparations.

Searching for sources of funding was a very important stage of all the initiatives under study; this applies to each type of the projects regardless of their thematic scope. A desired model is where it is the idea which initiates the seeking of funds, rather than a situation where the availability of funds for a specific purpose makes the initiators apply for them, most often with no regard to satisfying the most urgent local needs. A surprising conclusion is that the initiators do not expect large amounts of money to finance their projects – relatively small grants which are easy to settle are most appreciated. "The amounts of money we ask for are insignificant, from a few to a dozen or so thousand [zlotys]. I know that I can safely plan spending such a sum and settle it within a specific timeframe". Despite the fact that the initiatives surveyed were frequently funded by external sources (e.g. the rain garden was created thanks to a subsidy from the National Fund for Environmental Protection and Water Management – approx. PLN 14,000; the LED lighting system in the recreational centre thanks to a grant from an institution whose name was not mentioned – approx. PLN 4,000). Some respondents regard support for such actions as insufficient, and the procedures for obtaining and settling funds (especially from the EU programmes) too complicated, which discourages them from applying for such funds in future.

In the case of one of the villages surveyed, the initiatives were based fully on its own funds while the grants obtained (inter alia, from the Rural Development Programme 2014-2020) were only incidental – "those projects helped us achieve our goals in a better way, but they did not change the decision to achieve the goals anyway" – says one of the initiators. He adds that so far the measures and programmes offered by the European Union have not been satisfying, primarily due to the need to provide

significant own contribution (time, know-how and funds) and due to insignificant return in the form of e.g. co-funding. One of the ways to find fixed assets (e.g. machinery, technology, systems) is to cooperate with business, which has already been described in Sub-section 3.1 where technological examples (the glasshouse and irrigation system) are discussed.

The initiatives undertaken in Mniszek (Dragacz municipality) confirm that to put ideas into practice, it is not always necessary to have huge amounts of funds. The initiatives involved actions taken by the leaders who decided to increase inhabitants' awareness of environmental protection. The residents participated in the following: action "365 Bags of Waste", workshops entitled "Let's Save Bees" and "Let's Take Care of the Environment – Look into the Future, Remember about the Past", handicraft workshops on recycling and upcycling. The meeting was organised which was attended by an employee of the Environmental Section at the Municipal Office in Dragacz, advisors from the Kuyavian-Pomeranian Agricultural Advisory Centre, environmentalists and employees of landscape parks. Since there is a problem with waste segregation in the municipality, there is a constant need to educate the community in this respect. As stressed by the leaders: "We make systematic attempts at 'creating something from nothing'. We use tyres, plastic, second hand items to create 'works of modern art', which are then used to help organise our space".

The example of the rain garden shows how important for the success of smart initiatives is not only social acceptance but also co-participation and co-responsibility for the final effect – a dozen or so inhabitants were involved in the project. Moreover, the project initiators organised a meeting for the residents of the whole municipality and the local authorities during which the principles of functioning and the benefits of creating rain gardens were discussed. "The idea was to show that rain gardens are one of the solutions, to change people's way of thinking about the garden, which is not only grass and thuyas, but it can increase water retention". Such undertakings potentially impact not only a specific location of the project but also its wider environment. In literature, it is called a bottom-up approach to community development, in which the community itself is an initiator and activator of other local actors (Nikkhah, Redzuan, 2009). From the point of view of the beneficiaries of the action analysed in this paragraph, the following three factors turned out to be key to joining the initiative:

- initiators' incentives as well as requests for some support, in line with people's skills/job (e.g. asking a carpenter to make a wooden element),
- feeling that the project planned addresses their private needs (e.g. a new playground for children),
- perceivable societal benefits resulting from the implementation of previous projects in which they were not necessarily engaged.

3.3.4. Effects and sustainability of the initiatives

The effects of the projects analysed may be interpreted in two ways:

- quantitative – i.e. what concrete, measurable effects were brought about after project implementation,
- qualitative – i.e. through subjective changes of the quality of life, residents' behaviours, community building; these are often long-term effects – the most sustainable, but at the same time observed quite late.

The quantitative effects most often mentioned included the very fact of participation of a certain number of village residents in the initiative (at various stages thereof), which involved meeting new people, networking with neighbours, having good intergenerational fun. Other immediate effects were related to the goal of the initiatives. For example, the establishment of a rain garden resulted in no more flooding of the area concerned, installation of the smart lighting system increased safety and extended the time of using the area for public purposes during the day. The effects of constructing nesting boxes are not so immediate to observe as it is necessary to wait for certain bird species to nest there. As regards the production cooperative's operation, quantitative effects are reflected in the growing number of consumers, the volume of production and sales, new cooperation partners and the availability of new jobs for local inhabitants or a possibility to join the cooperative.

The most frequently mentioned long-term effects included: better integration of inhabitants, change of attitude to the common space ("If something is going on, I will respond to it more eagerly and quickly [...] the attitude to the common space has changed totally"), increased environmental awareness (e.g. creating rain gardens on private premises). The changes taking place in the communities surveyed were characterised by one of the respondents as a "learning process". In this case we can talk about the local community learning to collaborate, acquiring new skills and knowledge, learning formal aspects of organisation (e.g. writing applications for projects, project settlement). The effects which were revealed after a longer period (or are still wating to be revealed) of the initiatives on organic production relate first of all to the awareness of the brand and of what it offers. This also has an impact on other entities – increased visibility and the development potential of the municipality through systematic organisation of fairs, the BioTech congress (with international participation), YouTube viewers (education and information domain), indirect effect on EU rural policies through the participation of Tomaszyn village in the EU project "Smart Rural 21".

As pointed out by the authors of the "Evaluation Manual" (Polish Ministry of Regional Development, 2012), evaluation of long-term effect continuity provides information about project sustainability. Thus, considering the long-term effects mentioned by the respondents, it can be said that the initiatives under study are sustainable from the point of view of public project evaluation. A full evaluation of their sustainability from the point of view of economic and environmental effects is still impossible due

to a relatively short period from the project completion date. What can be classified as a durable solution, though, has appeared in the Tomaszyn Agricultural Production Cooperative "Ostoja Natury" (Olsztynek municipality). One of the irrigation systems using rainwater, based on solutions known for many thousand years, however nowadays forgotten, is used by its developers from Tomaszyn, and it is also offered for sale and – as ensured by a respondent from that village – is also enjoys great popularity abroad.

The effects described above relate predominantly to one village (although not always – as the example of the "Ostoja Natury" cooperative shows), which indicates that the concept of smart villages applies to specific places (villages, *sołectwos*) and this is the very level at which it should be implemented. This does not mean, however, that the effects are limited to those localities only. The implementation of the initiatives was often accompanied by information, education and promotion actions covering the entire municipality (e.g. a lecture on rain gardens, a visit by an ornithologist, an international congress, a fair covering a big area). Moreover, those initiatives are presented as good implementation practices of smart villages. They were also presented, inter alia, during an international workshop of the European Network for Rural Development (ENRD). One of the villages participates in an international project on smart villages, which is funded by the European Commission. The solutions applied in the villages under study may potentially impact other local communities in a broad sense, especially if a certain solution is novel and not so much disseminated yet, such as e.g. organic production within cooperatives – "we go beyond all norms and frameworks because we are the first to do some things in Poland. We are one of the pioneers of a broader approach to the environment, organising cooperatives, regenerative agriculture and smart thinking in Poland."

3.3.5. Key resources

In one of the in-depth interviews a respondent said, in respect of the initiatives under study, that "people are always their key element". Thus the study revealed that **this is people and their knowledge, experience, intellectual and social capital that form the basis for all the undertakings**, regardless of the thematic scope. Moreover, other key resources were identified:

- Financial capital: in case of a *sołectwo*, rural associations, other organisations operating for the benefit of the local community, external funds are the only source of funding smart initiatives. Leaders have to be quite creative, or even stubborn, in order to obtain them (e.g. by encouraging the inhabitants of Piaseczna Górka to participate in a receipt lottery in one of the hypermarket chains). Another example is the "Ostoja Natury" Agricultural Production Cooperative which, in order to maintain production and expand business, requires stable and huge financial outlays. Regardless of the source of funding, support for smart villages should take into account a multitude of entities and a catalogue of diverse smart solutions applied within rural communities.

- Environmental resources: in case of initiatives related to this theme the key was to identify the resources, their weaknesses (e.g. unfavourable terrain layout, mosquito infestation) and strengths (e.g. a lot of agricultural land suitable for crop production, potential for the production of heat and energy from renewable sources), which translated into better planning of tasks and savings (solar lighting system, seeking energy self-sufficiency) and improving living conditions (establishment of a rain garden, placement of nest boxes for birds feeding on insects instead of using chemicals, production of organic food).
- Cooperation and promotion: during many stages of project implementation interactions were frequent with other entities with regard to procedural (e.g. arrangements with local authorities), financial (filing applications for subsidies and grants) as well as many other issues (e.g. making available equipment for testing, ordering services). Equally important is the promotion of the actions taken as it helps reach various social groups with information, enables accepting the initiatives and joining the implementation stage, and inspires other people. Its main channels include the internet, e.g. Facebook (the website of the Association of Piaseczna Górka Residents 'Z Górki'), YouTube (Ostoja Natury TV).

"Although we do something innovative, something for future generations, something which is the future, everybody would like us to spend our own resources on it and give it for free". This pessimistic conclusion was drawn by one of the respondents, but it is in line with what was mentioned by many other respondents. Local resources (human, financial, material, information) were most frequently limited to what was worked out by the initiators themselves together with the people engaged. Although it was sufficient to implement many interesting projects, it may turn out to be insufficient to continue, extend and improve them. For example, the respondents believed that no support was provided from local government because it considered the bold initiator as a threat, and to put it bluntly – a potential counter candidate in the following local election. What attracts attention and is key to further development of the smart village approach is the fact that the above mentioned resources were – following the success of the initiatives completed – in a sense "sucked up" by various entities which should in fact support them, but they did not offer any real help in practice.

As can be seen from the descriptions of specific initiatives, their classification into a particular research context is quite conventional. Single actions include technological and infrastructural measures as well as social and agri-environmental ones. This breakdown has a structuring effect to some extent, however, it does not fully characterise particular initiatives. Their nature, combined with a multitude of underpinning factors, allows for classifying particular initiatives, their stages or fragments to one as well as to two or even three groups at the same time. Describing them in various places confirms some vagueness of the breakdown on the one hand, and a broad look at smart initiatives and a wide concept of smart villages, on the other hand.

4. IN-DEPTH QUALITATIVE STUDY – *smart villages* FROM THE PERSPECTIVE OF THE INITIATORS, PROJECT BENEFICIARIES AND LOCAL AUTHORITIES

4. In-depth qualitative study – smart villages from the perspective of the initiators, project beneficiaries and local authorities

Although the smart village concept has gained in importance in the rural development agenda in recent years (Chmieliński et al., 2021; Martinez Juan, McEldowney, 2021), in-depth studies of the initiatives submitted reveal that it is still in the initial phase of design (cf. Atastasiou et al., 2021; Stojanova et al., 2021). This is evidenced by differences in defining the concept of smart villages, including the capacity of the definition itself, the tools used or the role the concept should play. As noticed by Oskar Wolski and Marcin Wójcik (2018), the differences can be spotted not only between decision makers and scientists, but also among the scientists themselves (different points of view are expressed by representatives of geographical, political or economic sciences). The in-depth studies show that also among various groups of rural residents, the perspective and evaluation of smart solutions differs. It can be noticed that the perspectives of the rural inhabitants, i.e. the beneficiaries of the initiatives, the initiators of the actions and the local authorities differ on many areas, although points in common can also be found. The project initiators and beneficiaries much more often point to social aspects as examples of smart solutions while the local authorities emphasise advanced technological innovations. However, this is not the only difference in perceiving smart villages. This variation of approaches made the authors of this paper show the perspectives on this concept of the different participants in the smart rural development process.

A common feature of these considerations is the observation that Polish villages are increasingly using creative solutions. There emerge new initiatives and ways of solving problems that could not have been implemented before or were implemented only to a limited extent. Constant development of villages is noticeable, which results from the expectations of the local community – improvement of living standards and continuously growing aspirations. In order for individual solutions to effectively influence the improvement of living conditions in rural areas, there is a need for mutual interactions between particular groups of participants in the smart rural development process – initiators, beneficiaries and local authorities. Those interactions take the form of feedback. The rural residents (beneficiaries) indicate which needs should be satisfied, the local authorities support the initiators in their activities, while the initiators come from local communities and want to do something that will improve their living conditions. Obviously, this does not exhaust all possible interactions (Figure 4.1). The following can be observed on the local authorities – beneficiaries axis:

- efforts to seek re-election in subsequent local government elections, which are manifested in election promises that are either kept or not kept during the term

of office or are replaced with new promises (as the time of the next election approaches);
- the local authorities seek all possible ways of implementing initiatives aimed at improving living conditions in rural areas because it is they who are held accountable for their promises;
- residents' requests concerning various spheres of life for which the local government is responsible; the requests usually relate to basic goods and services (e.g. road modernisation, pavement construction, pre-school extension, improvement of water and sewage infrastructure) or interventions in current affairs.

On the beneficiaries – initiators axis:
- as in the case of the local authorities, the beneficiaries submit a number of ideas and requests, or even demands to the initiators (our study shows that this happens more frequently, the more active the rural leader is); some beneficiaries co-participate in the initiated undertakings, some of them express their willingness, however do not take any actions, and the rest are not interested in rural issues either at the idea or implementation levels;
- the initiators consult their ideas with the residents, expect comments, support or totally new ideas from them; here also a few models may be distinguished, starting from the leaders who always engage the local community in actions to those who base their operations predominantly on their own work (neither of those opposite types is better/worse than the other one, and there is still a great number of combinations between them).

In addition, a network of relations between the local authorities and project initiators can be observed. The study shows that the initiators expect the local authorities to allow them to act, to have freedom and that the authorities should not "get in the way", as was repeatedly said in the interviews. This does not mean, however, that interactions between those two groups of stakeholders are based exclusively on not getting in the way – on the contrary, by virtue of the powers vested in it, the local authority makes decisions about the initiatives, influences their financial success, etc. On the other hand, the initiators very often have various functions in the local authorities, which is a decisive factor for their continuing cooperation with the head of the village, mayor, council members or officials. However, the initiators do not always expect the local authorities to provide financial or material support. Sometimes they only want the local authority to notice the initiative under implementation and to promote it.

Interactions do not only occur between smart development participants. It can be observed that at the same time every participant influences the development opportunities of the local communities and villages in which he/she lives (and also of the region, to a lesser extent), whereas rural development influences particular participants. The successful implementation of the initiatives has impact on increased mobilisation of the local community and facilitates seeking new solutions to enhance the quality of live in a particular locality. This also encourages the initiators to take further

actions and the local authorities – to support them. At the same time, the successful implementation of the initiative increases local attractiveness in terms of investment, so that such localities have a much higher chance to attract investors. This shows very clearly only a portion of mutual networks of interconnections and relations between groups of respondents. A detailed analysis helps see hundreds of such relations and interdependencies.

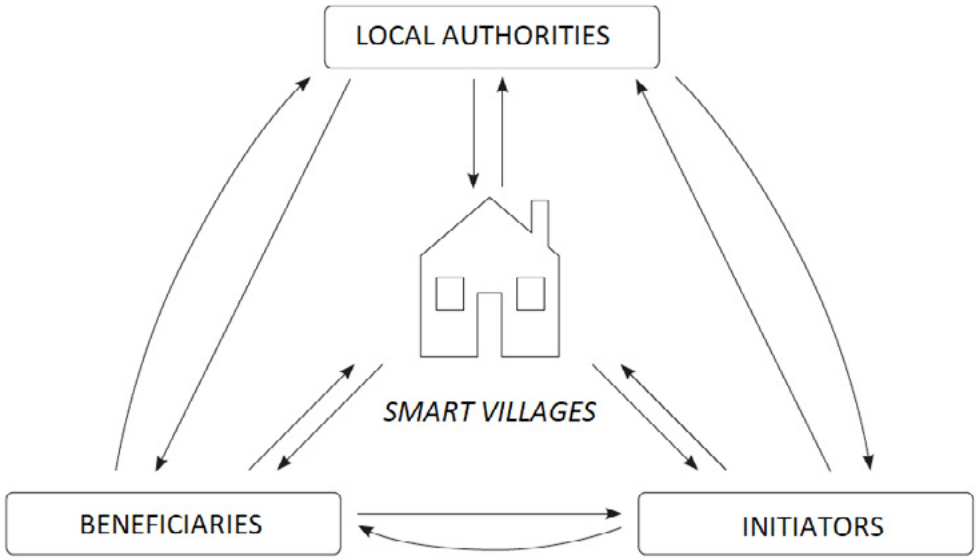

Figure 4.1. Mutual relations between participants in smart rural development and smart villages
Source: own work.

As has already been mentioned, the interactions and interrelations affect the perspective on smart solutions. Each of the groups has different reasons for undertaking initiatives, sees the process of joining them differently, pays attention to different implementation constraints. A difference in the perception of sustainability of the initiatives and their impact on society can also be seen. The following subsections describe how the respondents see their and the other actors' participation in implementing smart solutions. The task of potential initiators of the smart village concept is to understand and make use of the knowledge presented. The understanding may contribute to the success of subsequent initiatives – it can be assumed that is a condition for successful actions (a look at the perspective of particular groups and communication among them).

4.1. Initiators

As has already been pointed out above, the initiators in this in-depth study were a group responsible for project implementation usually at all the stages – starting from an idea through planning, seeking and settling funds, information and promotion, inauguration, to the ongoing maintenance of infrastructure (if it was constructed as part of the smart project). This group was represented by broadly understood local leaders, mainly having official functions in the local authorities – heads of villages and members of *sołectwo* councils, heads of municipalities and mayors, heads of rural associations and foundations, municipal councillors.

4.1.1. Understanding the smart village concept

The local initiators and leaders often understand this concept in a similar way; in their opinion the smart village approach is to help solving problems diagnosed in a given locality or in a given area (e.g. a municipality), taking into account available resources. The instrument is to offer organisational and financial tools in order to achieve the goal: "we are looking for various solutions. This way we show our wisdom, intelligence and cleverness", said one of the initiators in this context. It is very important to inform and engage inhabitants, to exchange information through different channels and to cooperate, which enables adjustment to various recipients and prevents exclusion of a social group, e.g. people who do not use the internet or new technology. According to the initiators, smart villages is also a certain concept/strategy/vision, the implementation of which must be pursued by taking many different actions agreed on together with other stakeholders. It is worth citing one respondent from Staszów municipality: "I have learned in the school of leaders that vision is important but you must show people how to achieve it."

Smart solutions are to ensure the best possible living space for the residents and make the quality of life equal to that of urban dwellers, which was pointed out by one of the initiators: "It is possible to increase the effectiveness of management and of service provision and to improve rural competitiveness, while respecting the economic, social and environmental needs of the present and future generations". Another initiator added that smart initiatives should be undertaken so that "life in rural areas should be a mark of quality, not of shame". The feeling of inferiority to urban residents appeared in the interviews among the initiators and rural inhabitants alike. However, which is important, it was combined with a will to prevent deprivation of needs and striving at increasing well-being (cf. Kalinowski, 2020; Łuczak, Kalinowski, 2020). This points to the growing aspirations of rural residents. It can be confirmed by citing one of the initiators, in whose opinion "smart villages are the ones which are trendy and make progress", however, she did not define progress, which leaves room for a broad spectrum of actions. Also other interviews point to the im-

portance of increasing competencies and acquiring new skills by the rural inhabitants which they may use in practice in order to improve the quality of life in rural areas.

Openness and broadness of the definition makes us aware of how capacious the smart village concept is. One can notice variable interests related to implementing solutions which fit into the assumptions of a given concept – as has been broadly discussed in Section 3. The interests differ not only with a view to the topics, but they also depend on the point of view, position or participation in the implementation or the extent of using a given solution.

4.1.2. Reasons behind undertaking the initiative

The interviews show that most often the initiative is a result of a diagnosed problem which had to be solved urgently. The study reveals that the problems varied greatly – from those of palliative care to social and community integration initiatives (e.g. incapacity of healthcare or leaving ill and terminally ill people on their own or under continuous care of their families led to the establishment of the home hospice; flooding of a plot of land around the football pitch was prevented by establishing a rain garden; lack of a venue dedicated to meetings and integration of inhabitants contributed to building a gazebo using renewable energy sources; low levels of inhabitants' activity and their lack of awareness of what was going on in their village made the head of the village run an internet blog; a dilapidated sports hall far away from the school was replaced with a new one near the school). It is difficult to compare and value those initiatives. Each solves different municipal problems, each results from different possibilities and resources available. What unites them is responding to the needs of local communities.

The leaders of the villages surveyed underline that their actions are driven by a certain vision, by what can be done to improve the inhabitants' lives rather than by availability of funds for a defined action. The head of one of the localities who at the same time is the head of a rural association and member of the municipal council warns that the funds obtained should not be a result of the so called 'grantosis', i.e. applying for funds available for a limited number of projects which are not necessarily related with the most urgent needs of a given locality: "today they give money for websites, tomorrow for a social integration club, and the day after tomorrow for deep wells, so we're taking it all". Such a model of action within local communities, despite its popularity, is increasingly perceived as a risk to sustainable rural development, especially if a village has its own vision and clearly defined development goals. Some ideas are being picked up in other places, even abroad, which shows that the initiators are open to external environment, make use of training, study tours, etc. However, which is worth underlining once again, small projects worth several or tens of thousands of zlotys are valued most. Such funds are easier to be distributed and settled and they do not create a risk of social protest or residents' gossip about mismanagement

or even theft. It was the small projects which were most often submitted to the *My SMART village* competition.

The diagnosis of inhabitants' needs is made in multiple ways. On the one hand, public consultations (also online as in Wiązownica-Kolonia) and meetings are held for the purpose, and on the other hand, it is the result of observations and conversations, often on an informal level, among friends. It happens that an initiative is implemented without consultations, according to an initiator's intuition and feeling that the given investment will "work". Lack of consultations or limiting them to a narrow group of people is usually the case with big and costly ideas. The implementation of some measures in the village makes rural inhabitants notice that useful solutions can also be introduced where they live (with the use of the available resources), and not only in cities.

4.1.3. Engaging local community and cooperation

Establishment of an association or another form of organisation (inter alia rural homemakers' clubs, local action groups) was a turning point of numerous smart undertakings surveyed. A formal organisation gives access to many funds, enables networking and running a business. The existence of a formal organisation which undertakes activities for the village is also in a sense easier to accept and understand by the residents. From the point of view of the leader the most important thing is to diagnose local resources such as skills and knowledge of particular persons within the group managed. The establishment of associations was very often promoted by heads of municipalities who pointed to opportunities of getting subsidies from external sources. A kind of multifunctionality of leaders can be identified in the villages under study: the head of the village who is or was a member of the local authorities (e.g. a council member, mayor, head of the section in the municipal office) becomes president of the association (e.g. Associations: Kacanka River Valley, "Z Górki", Association for Integration and Development of Łuszczanów Village). Very often local leaders become natural candidates for local government functions. The residents notice their engagement and promote them in the subsequent elections. It happens, however, that engagement in local issues leads to conflicts with the present authorities or council members for whom an engaged initiator becomes a potential competitor.

Many initiators underline that it is difficult to persuade the residents to implement the initiatives. According to the initiators, it is far easier to get interest of the youngest generation and seniors rather than middle-aged inhabitants. Hence, one of the ways was, inter alia, to engage children, and as a consequence – in the long-term – parents. It was difficult for the leaders to give clear reasons for such a phenomenon. They supposed that it might result from the amount of free time the inhabitants had, or from a change to a more egocentric lifestyle or simply from the feeling that they did not need to co-decide about their surroundings beyond their own backyard. The

interviews show that reaching such people is possible and – as was clearly expressed by one of the respondents – "mobilising or encouraging people to take actions is not only the role of the head of the village or president of an association, it is the role of each of us. [...] If you see somebody who could become potentially engaged, invite them to participate in our action". Engaging the local community is vital and it is key to creating a smart environment. Therefore the residents should be persuaded and shown that they can do something of benefit to the place they live in. A common goal, around which the biggest possible number of people gather, is important because "it is better to live in a village where people care for something common". Engaging in the initiative is also an element of greater identification with the project. As one of the initiators said "social change takes time and is long-lasting" – people are most easily convinced by the changes they can see, e.g. clearing a formerly neglected plot of land (the area of the old dairy at Wiązownica-Kolonia, a little pond in Łuszczanów, renovation of the school and adaptation of its classrooms so that they can be used as the permanent observatory for astronomy enthusiasts, etc.). Social initiatives such as the Prophet Elijah Hospice, though very much needed and important, are more difficult to observe by the inhabitants, especially by those who have never received such help.

Relations with the local authorities are important from the point of view of the initiators, but in the initiatives under study the role of the local government often ended with allocating the *sołectwo* fund, giving consent to start works on a public plot of land or taking patronage of an event. However, this is not perceived by the leaders as a lack of will to cooperate but rather as giving them freedom to act and vesting trust with them. In several cases the local authorities supported projects by providing substantial advisory services, venues for meetings and events, and collateral for bank loans. One of the initiators pointed to the relatively big interest of the local authorities in self-organisation within *sołectwos*: "the local authorities encouraged us to be more active, to establish associations and seek funds from various sources".

4.1.4. Impact of the initiative on the surroundings, including the quality of life, and sustainability of the solution

The initiators most often pointed to better integration of the residents, especially those who engaged in assistance and brought about the final effect. Thanks to that, people ceased to be anonymous to each other, they started to recognise each other and meet in public leisure and recreation sites – in such a situation it is easier to ask somebody for help, advice or an opinion. The above observation relates to various types of the initiatives surveyed. As admitted by the respondents, the initiatives implemented have a positive impact on the village's image, and even make the inhabitants 'feel proud'. Apart from unquestionable benefits this has also some shortcomings, as "people quickly get used to good things" – demands grow. This is why it is worth reminding and showing the residents how a given place looked prior to the initiative's

implementation, especially if the contrast is very striking. Moreover, the initiators point to the fact that media coverage made the leaders of neighbouring villages also initiate actions to enhance the quality of life in their *sołectwos*. As it turned out, some projects can impact decisions of young inhabitants. The initiators want to show "to the residents of the surrounding villages and localities that their children have the power to do anything", e.g. in Niedźwiady a person who attended classes and workshops became an astronomer after completing his studies.

As already mentioned in the previous section, sustainability is understood not only as the formal upholding of project outputs for several years, but also as the usability, usefulness and practicality of a given solution. The initiators highly rate their projects, often pointing to the prizes and awards they received. Such high rating is also influenced by the feeling that the identified smart solutions were implemented in response to a specific need, and not by force in spite of residents' resistance or passivity. The bottom-up nature of the initiative, in the opinion of the respondents, fosters its usefulness. Very often those solutions are so new that the initiators are very careful when they talk about the future thereof. The smart villages surveyed also feature a relatively high resistance to crisis, e.g. the current COVID-19 pandemic. Social capital enables them to take quick action and turn threats into development opportunities, as in Piaseczna Górka: "In the beginning we were sewing face masks. And then the project provided us with two sewing machines, which are the property of the Association. In some time it will be possible to run a sewing course". It should be emphasised that the sustainability of the initiatives under study cannot be examined on one scale, as they are thematically diverse (which has been described in detail in Section 3). Some of the solutions, such as the village community centre, astronomical centre, sports hall, are undoubtedly sustainable. In case of some of the soft initiatives related to e.g. raising educational levels, promotion of culture, support of students with special development and educational needs, it is difficult to unequivocally assess the sustainability, which was emphasised by the initiators themselves.

Some of the solutions surveyed have already become models for similar projects in neighbouring and remote localities. Some are so untypical that they are difficult to replicate in other villages but they may become a "hotspot for those who think that we in rural areas don't deserve anything", one of the initiators says.

4.1.5. Constraints to the initiative's implementation

Initially, the effectiveness of obtaining external funds was low in most of the localities surveyed but the respondents indicated that lessons were being learnt in the process and the quality of applications was improving. One of the initiators pointed to a change in law which frustrated the plans to obtain funds and, as a result, it was necessary to seek new sources of funding. Therefore, not only the right ideas are important but also the organisational and technical background, because it determines

the implementation of initiatives that can later be called smart. Since the beginning of 2020, the coronavirus pandemic has prevented many plans, such as festivals and sports events or workshops and training courses. Forms of online communication, e.g. via Facebook, have proved helpful in that time.

Some respondents pointed to the inhabitants' distrust and insufficient involvement, lack of financial support from the local authorities or politicisation of the local government as constraints to the implementation of the initiatives. It is worth noting that, in line with the initiators' opinions, one of the significant obstacles to creating a smart village may be the layout of the settlement – the scattering of houses does not facilitate integration, information flow or a sense of community. To illustrate the problem, an example of one of the localities surveyed can be given; it consists of nearly 10 hamlets, the inhabitants of which stay predominantly within them and create micro-communities there.

4.1.6. Ideas to support local leaders

It is the so called new residents who quite often become leaders and initiators of smart actions. They are the ones who moved to a village from a city not long ago or who, after getting married, settled down in the homeland of their spouse. They have substantial human capital acquired at the previous place of living, they are willing to take actions for the benefit of their new settlement, and they come up with many fresh ideas. It is the diverse skills and competencies of the people responsible for the implementation of the initiatives surveyed that proved to be the key to success. The words of one of the local leaders may be taken as a good piece of advice for others: "when selecting people to the association's team, I looked at such competencies that I don't have myself". Delegating tasks helps relieve the leader of the burden and counteracts his/her burnout, and at the same time contributes to preparing his/her successors. Sometimes, because of their strong personalities, lack of trust in colleagues or simply solitude, the leaders feel they can handle all of it themselves: "when you are an expansive individual, you fill all the space and people don't see any space left for themselves anymore".

One of the leaders emphasised in the interview: "don't listen to bad opinions, comments and people who only negate actions, even if they do not take an active role in them". From such people you can most often hear: "But why are you doing this at all? Who will be interested in it? Who will come there?". In addition, you should look for people in Poland with "a positive twist" in the context of initiating various types of activities. Such cooperation mobilises, enables the exchange of experience and gives a sense of support, even when you have a "bad day and no motivation to continue or initiate actions".

The leaders count on support from the local government, either in the process of preparing the project or at the stage of seeking potential sources of funding (especially

in the case of EU funds). It is also important for them that the municipality could – at the moment of obtaining state aid – provide its own contribution, which is sometimes required. However, a possible lack of such support does not discourage them from taking action. What discourages them is excessive bureaucracy. The initiators also expect local authorities to notice their initiatives and, even if they do not support them financially, to at least promote them. It happened that actions taken by the local leaders were not perceived as smart by the local government, although the leaders of these initiatives and the residents were of a different opinion.

During conversations the initiators frequently said that they expected the local authorities "not to get in the way", to let them "do their job" and not treat them as a threat to the local government, but as a great support to it. Usually, the initiators can count on help from social economy support centres or local action groups, however, "if you don't ask for help, no one will come and ask if you need it", which is perceived as undesirable behaviour on the part of institutions which in fact should themselves come up with initiatives and proposals of support. The situation in this regard varies depending on the activity and experience of a particular institution. Also, the support provided by the local governments to the non-governmental sector is perceived as insufficient. The initiators pointed, among other things, to the lack of open competitions for mini-grants, provision of support for only selected organisations involved in one field (e.g. sports) or not involved in actions for the benefit of the municipality's rural area. Someone expressed an opinion that at the local level "there is no room for organisations doing something else than a task commissioned by the municipality". One of the hypothetical reasons for this may be the aforementioned fear of too active community leaders who – in addition to the goal of improving the quality of life in their villages – can pursue their own political objectives.

4.2 Beneficiaries

Beneficiaries were identified in the in-depth study as individuals who use a given solution, who are its ultimate recipients. As regards this group, usually the interviews were conducted with ordinary residents, often met e.g. on a street or in the store in the locality where the initiative was implemented. In most cases these people did not know the background of the development of a specific smart solution, however, the voices of those who participated to some extent in its development were also taken into account. Paradoxically, among the respondents there were also people who had never heard about the initiative under study and had never made use of it. Such a variety of beneficiaries turned out to be rich comparative material and enabled verifying some hypotheses made by the initiators and local government representatives.

4.2.1. Understanding the smart village concept

The vast majority of the residents were not familiar with the concept of smart villages – sometimes they heard about it in the context of a prize or award won in the *My SMART Village* competition. Only after explaining the meaning to them, some had doubts whether the initiative surveyed could indeed be called smart due to the negligible presence of a technological element in it and the huge importance of a social factor. However, they regarded those solutions as useful and beneficial to a large part of the rural community. They said that thanks to the initiative the community became more active, they got to know their neighbours, living conditions in the village improved because the surroundings became safer and more beautiful, etc. When trying to define the concept, the beneficiaries focused mainly on the technological aspect, however, often at its basic level, namely access to the internet and a good mobile phone coverage. One of the residents imagined a smart village as associated with "development, cutting-edge technologies, making the surroundings more beautiful, but at the same time returning to tradition and immersing in the ancient rural values". Another one added that it is "a feeling of unity and community and inter-neighbour integration". The aspect of ancient values connecting older and younger generations was present in many areas under study as a sort of a local community unifier (e.g. works on the old school renovation, local history questing path).

The group of beneficiaries also included those who had heard about the smart village initiatives in their localities. Usually, despite active participation in the actions, they had difficulties in defining them. One of the residents said that this is a village which is "well looked after", another one that this is a village which "is developing, moving forward, a village that needs digital solutions, because of the computer age we are living in now". In some answers it was defined as "the village that is making progress and a lot investments". Other persons emphasised that this is "a more aware village which knows its possibilities and makes use of them in order to develop". What is interesting is that many respondents underline that every village has to find its identity. For some villagers it is not important whether the initiatives implemented make use of digital solutions – "they are not required", but they underline that "they may appear because it is advisable" or they note that "there is no way out as technology is developing so fast that we are unable to stop it". Some of the beneficiaries within this surveyed group mention an innovative character of social measures (training, meetings, workshops), although new technologies were not always used to implement them. It is worth noting here that the beneficiaries think that innovative solutions are those which they have never encountered or used themselves. This does not have to be an innovative solution on a national or even regional scale.

A very interesting definition of smart villages was presented by one of respondents from Michałowo who pointed out that it is "a village which is wise with a wisdom of generations", and added that smart solutions do not necessarily have to be of techno-

logical nature, as social solutions are very important, especially in peripheral villages and communities. She further added that "it is necessary to study the local environment and listen to people because if somebody says they don't need help, it doesn't mean that it is so. You must keep your head and heart open". Such an approach is shared by other respondents from Michałowo.

4.2.2. Impact of the initiative on residents' lives and the economy

The rural residents generally see positive impact of the initiatives surveyed on their lives, depending on the context – culture, entertainment, living conditions, good neighbourly relations or improved financial conditions. The respondents mentioned even such mundane issues as text reminders about waste collection sent by the head of the village (text messages make life easier and at the same time they do not generate any additional costs). In general, the inhabitants appreciate most the comprehensive solutions that offer attractions for different people: "On Sunday we go to the park, the kids will have fun there, we will sit down there and use the library or the outdoor gym, and then we will have ice cream". Beneficiaries perceive smart solutions as those that improve the financial situation of their village and municipality (e.g. in connection with LED lighting powered by solar energy), but above all they note that the more attractive the village, the higher the potential tax revenues for the municipality.

There were situations where the residents had not heard about the project under study and never made use of it. These persons usually paid attention to municipal investments – construction of pavements, upgrading of roads, building of a sewage system, i.e. basic elements for improvement of living conditions.

The group surveyed included also people who, although they had heard of the initiative, they never made use of it. Those inhabitants underlined that they were proud that the initiative was implemented and that "people from all across Poland visit us and sometimes our village is on TV". The initiative increased interest among tourists who, when visiting the municipality, make use of accommodation, and/or catering services, thereby supporting the local economy.

In many cases inhabitants of the neighbouring villages, having learnt about the solutions surveyed (e.g. in the local newspaper or on the radio) visited those sites or tried to run similar projects in their villages. There were also people who claimed that the money could have been dedicated to other purposes, however, it was difficult for them to specify these. There were fears that municipal budgets could be overburdened with the cost of the project/facility maintenance in the future. There were a few sceptical voices, but the ones praising the initiatives and leaders' involvement dominated.

Although it cannot be unambiguously stated that village activity, its numerous cultural, sports and leisure opportunities, well organised space directly attract new residents or prevent the outflow of the present ones, in the interviews examples of

people who bought land or already moved to the locality surveyed were given. They chose the place which, in their opinion, offered them better quality of life in infrastructural, social and environmental dimension: "now a guy has bought land in our village, which is very expensive, and he's bought it because he liked the qualities of the village, that something is going on here, that the landscape is so nice, and that there is peace and quiet, the air is rather clean".

The exceptionality of the solution is pointed out to by the beneficiaries of the support provided by the Prophet Elijah Hospice. They say it is exceptional on a national scale. They underline the openness and involvement of its Director Paweł Grabowski. They draw attention to the fact that for him "a human being is what counts". They notice that thanks to the Hospice activity they can be close to an ill family member and at the same time they may be significantly relieved from some of nursing care they provide for such a family member. One of the nurses engaged in the initiative underlined that the medical personnel "helps but does not take over duties [...] we are becoming a substitute of a family assistant".

4.2.3. Engaging in the initiative implementation

With each new initiative, the sense of common purpose grows in the residents, it is easier to persuade them to act in solidarity (e.g. sewing face masks at the beginning of the pandemic, further projects, support for actions). It is worth quoting one of the respondents who ensured that "if something is going on, I will react to it more eagerly and quickly". Interviews with the inhabitants confirmed the initiators' opinions that engagement in projects aimed at villages comes in waves, some inhabitants engage the others, thereby increasing the number of those engaged. A resident of Piaseczna Górka did not conceal that at the beginning he was quite sceptical about joining in but in the end he got engaged so much that together with his wife they "brought a large herd of people" from their street to take part in a workshop on how to build bird-feeders (for birds which fight mosquitoes).

A frequently highlighted problem is the unchanging composition of the most active group – as a rule, these are the same people, which may even give rise to conflicts about insufficient representation of the voice of the remaining residents. Some residents complained about not being able to participate in the activities, while at the same time explaining that they did not come up with their own initiatives due to lack of time. At the *sołectwo* level, one can see political divisions, which often polarise the inhabitants within one village, as well as overriding "scepticism and belief that it will be a failure, we won't be successful". However, it is the residents who "understand their own needs best, [...] it is so incredibly effective because it is difficult to understand what a village needs from the central government level".

The smart initiatives are noticeable and interesting enough to become a subject of rivalry between neighbouring villages. In one of the interviews a respondent under-

lined that during talks with her friends from a neighbouring village she often used the argument "we even have a cinema, this is what our village is like", and very often she heard the following answer: "the village has received some money so it was easy to arrange a cinema". The respondent underlined that "that very initiative was developed practically without any cost, unless we count the volunteer work of the villagers who helped clear a barn and move in some equipment". There were also examples of successful cooperation e.g. among three villages in Staszów municipality which, although currently forming separate *sołectwos* (they have different representatives in the municipal council, their own organisations, rural homemakers' clubs, voluntary fire brigades), they used to be one settlement once. By making people aware of their past, common celebrations of jubilees, getting to know their predecessors, it is possible, despite competition, to run various projects "across divides among villages". Also in the municipality of Mniszek, the history of the locality is used for smart action "Grandparents to Grandchildren – History that Surrounds Us".

Part of the respondents noted that local governments should do more consulting with the inhabitants. One of the respondents said that "we are the last ones to learn about investments. No one asks us what we need". The residents drew attention to the fact that there was no *sołectwo* fund. Although in many cases they declared that they would willingly engage in actions ("people want to act, someone has to make it possible for them"), the initiators indicated that such help was usually limited to the "people who have already demonstrated their abilities". One of the initiators confirmed that "it is easier to implement ideas in a small group. A big group of people makes any consultations difficult. [...] The more managers, the fewer effects". One of the beneficiaries, quite closely connected with one of the initiatives, said that it was difficult for the inhabitants as well as local government representatives to stop thinking "what's it for?", adding that "it is easier to complain than to start working hard".

4.2.4. How should local governments and central governments support such initiatives?

The beneficiaries appreciate good leaders, however they see a need to engage other inhabitants in the process of co-deciding and actively participating in the implementation as they noticed that "the leader won't do much on his/her own. Both parties must be active – somebody who will collect information, identify the needs, look for funds available. But a team of people, inhabitants who will support him is also needed for that". For example one of the inhabitants was praising the head of the village in terms of her knowledge of human resources in her village: "The head of the village is a young woman, dynamic and active, and she feels like doing things. She talks to people, sees problems, tries to solve them somehow. And she engages our residents – if the street light does not work, she engages an electrician to fix it".

In the opinion of the beneficiaries, the local authorities should support innovative solutions if not financially, then by providing administrative and organisational support, e.g. by making available premises free of charge. The respondents claimed that the leaders would cope on their own, if "nobody gets in the way". However, at this point it is worth recalling initiators' opinions, who believe that this may result in leaders' burnout and finally their withdrawal from activity for the benefit of the village.

The opinion that "you will not achieve much without cooperation" is quite common. It does not mean that cooperation is common. Quarrels, concerns and misunderstandings at the local level are quite frequent. Communication is not very well developed, which is also mentioned by the beneficiaries. One of them recalled that communication was the key: "the first commandment for investments – communication, the second – communication and the third – communication...". Thus, it seems care should be taken, in particular, of communication between various local community groups. One of the initiators drew a sad conclusion that "the rural folks may have lost for ever the ability to cooperate". The only hope is that this is not true.

4.3. Local authorities

The last group to have participated in the study are local authorities. The participation of that group was very important as regional government units play a significant role in rural development in Poland. Their task is to satisfy collective needs of local communities in respect of e.g. land management and environmental protection, water supply system, healthcare or local collective transport system. In 2021 there were 2,477 municipalities in Poland, of which as many as 1,523 were rural ones. Considering the number of municipalities and their area, it may be concluded that the potential for introducing smart solutions is great. It is also important that local governments have the means to create smart actions as well as to support them, account having been taken of regional and local needs. This is why local authorities have a special role in smart initiatives.

The group surveyed included primarily the representatives of local governments that were not the initiators of the undertakings analysed, but were observing them (or learned about them during conversations), who participated in them to a limited degree (e.g. by issuing administrative decisions or supporting NGOs in the framework of their tasks) or prepared projects aimed at applying for funds. They were not only heads of municipalities, mayors or municipal councillors but also municipal officials holding various functions (including managers), staff of municipal administration units (schools, social welfare centres, cultural institutions, sports and recreation centres), management boards of municipal companies.

4.3.1. Understanding the smart village concept

The respondents from that group had the opportunity to learn about smart issues in urban as well as in rural areas e.g. during local government meetings. However, some of them said that they had never heard about the concept before. The interviews conducted confirm that they understood the concept in quite a similar way as e.g. the initiators, i.e. as a sort of an exceptional village which implements various projects needed by its residents, including the IT and communication element. In addition, local government representatives drew attention to the aspect of improving people's well-being and to the fact that smart solutions make life easier. More often than the other groups they mentioned environmental measures as examples of smart solutions. And what was noticeable, this group very frequently expressed opinions that "the solutions must be covered by local budgets, which changes the perspective on the order of taking actions".

At the same time they noted that any steps taken by them, while working for local communities (by making use of social innovations and innovative solutions), were aimed at ensuring the residents the best possible living space, aligning their living conditions with those predominant in urban areas. In their opinion, the main tool for this was the technological progress made in recent years as well as the possibilities of making use of digital skills and new technologies by rural inhabitants and by public administration staff.

One of the local government representatives said that a smart village "is a village which is strongly rooted in its tradition but which takes care of the environment and climate". Another one added that he associated a smart village with a "connection to the world, for which you need a fibre optic network". And in his opinion, "there are no problems with that in urban areas, but in rural areas such connection and digital communication is still far from being perfect". Such opinions were also shared by other participants in the study. In this respect the local authorities want the inhabitants of peripheral localities, situated far away from cities, *sołectwos* and small villages, to have contact with the world; and this contact should be as easy for them as for urban dwellers. This was confirmed by the opinion of one of the respondents from that group, who underlined that "it would be nice if it was a village which had fibre optics and in which all the residents had full access to the fast internet". He added that "due to a lack of basic tools it is hard to talk about building smart villages". Only when these key problems with signal coverage are solved in rural areas, there will be a chance to implement various smart initiatives.

Some respondents emphasised that it is a "cool initiative" and that thanks to the bottom-up actions and the use of the internet, it would be possible to promote small localities: "there is much talk about big cities and small localities are forgotten because they are not interesting for the media". It is worth highlighting that the local authorities realise that they do not use various communications sources to the full extent;

they say: "we are surely neither the first ones nor the last ones who do not use it". It is puzzling that sometimes local governments are afraid of new technologies, arguing that "it is something new, somebody must learn it and somebody must then implement it".

The studies show that when defining smart villages, local government representatives start to have doubts whether the measures implemented in their area may indeed be called smart. They underline that "every village, municipality, region, is completely different" and therefore the solutions applied should reflect it. One of the local authority representatives pointed out that he understood the smart village notion as "local communities within which actions are taken in both the economic and – most importantly – social domains". He added that those actions enhanced the quality of life and living standards of the residents. He also believed that improvement of the living standards was "the effect of using more and more common and available innovative solutions from the sphere of new technologies". Such a combination of technology with social solutions was repeatably pointed to by many respondents.

There were attempts to define smart villages as a "factor facilitating a release of rural creativity" or "an element of improving living comfort". Some respondents from the group defined the concept as "the ability to care for the welfare of the individual [...], collective work for the general public". The number of different definitions of the concept shows that it is not yet very well-established among most of the respondents. Apart from the initiators, the remaining participants in the study treated the concept in quite a flexible manner, by broadening its definition. A motif recurring in the majority of the definitions was the feeling that the smart village concept is to improve living conditions in rural areas.

4.3.2. Participation of the municipal government in the initiative implementation

In light of the law, local governments must participate in such projects, only because *sołectwo* funds used for smart actions form part of the local budget. Many undertakings require a formal consent from the head of the municipality/mayor or municipal council. The respondents within the group underline that if something can be done without their participation (or the initiator does not want them to be involved), then they do not participate. However, they are open to discussions if the initiator comes up with an idea, because they see "a mutual benefit". There have been cases where they have learnt about an initiative only when the initiator came to them with a ready smart solution. Sometimes the initiator needed only an approval from the local authorities or a contribution. In one of the interviews it was stressed that there were situations where the municipal office was not informed about a specific project, which had financial consequences for the municipality (e.g. a necessity to maintain infrastructure). The local authorities claimed that municipal offices also offered

formal assistance, e.g. in writing applications by NGOs. It should be emphasised that engaging the municipal office in the initiative does not always mean financial support. The municipal office may support actions carried out in another way, e.g. by offering the initiators a contact address at the office, or by providing some premisses, necessary materials or land free of charge.

In nearly all the cases the respondents pointed out that the initiatives undertaken were complementary to local government measures, underlining their importance: "such bottom-up initiatives are the most valuable". They indicated that the initiators, including e.g. associations and foundations, should look for other financial sources as the municipality cannot always afford actions that have not been planned in the budget. Very often the initiators were at the same time local government members, which made it easier for them to make decisions and which increased the engagement of the local authorities at various stages of project implementation. It is slightly more complicated if the initiator is not directly engaged in local authority measures.

4.3.3. Impact of the initiative on the surroundings, including quality of life and the local budget.

The local authorities assess the impact of particular initiatives on the surroundings differently. Although some local authority representatives see them as an opportunity to enhance quality of life, they very often think that the projects are of rather marginal importance. Maybe this is because the micro-effects of smart projects are not seen from the municipal office level at which large-scale initiatives are implemented. What is important is that opinions about it depend on the role of a particular interviewee – most advantages are seen by those who were somehow engaged in the initiative. This does not collide, however, with the feeling that the projects have a big promotional role for the municipalities and open up more development opportunities.

From the point of view of local governments, proposals from the *sołectwo* funds, made additionally, are often a burden for local government budgets. Therefore many heads of municipalities encourage local leaders to seek additional sources of funding. Some respondents see savings resulting from the initiatives undertaken, e.g. if the project is implemented in partnership with a rural association and the municipality, then the maintenance cost of the building in which the project is implemented will be covered out of the project budget. The local government representatives noted that if such a project were implemented by the local government only, it would be more expensive. The participation of partners also enables them to be relieved of some administrative burdens.

Frequently opinions are expressed that the initiatives "are value added for the village and the municipality alike [...], and they increase their attractiveness" and therefore the municipality supports them financially. However, there are also opinions that the initiatives are cost intensive: "they generate costs which are difficult to cover

by small municipalities. We'd rather spend this money on investments such as pavements or lighting". According to the studies conducted, sometimes the initiative generated costs, but these were costs related to a contribution when the initiator obtained external funds and then he/she benefitted from local government support. We heard an opinion that such actions meant "doing the local government's job, so we should be happy that the initiators are able to obtain funds, and we, as the local government, may contribute some money so that they can do what they like and what they are knowledgeable about". All the more so that "the municipality has a lot of tasks and few people. And if you give something to be used by the *sołectwo*, then people identify with it better than if the municipality built it".

One of the mentioned added values of the actions under the smart village concept are unconventional educational activities for children. They are of a cognitive nature and they enable children to practice their manual skills rather than use phones and computers all the time. Such solutions are also highlighted by Andrzej Hałasiewicz (2020), who gives the example of agricultural educational farms, the owners of which educate children, youth and adults by promoting environmental measures.

Although the municipal authorities notice that the initiatives in their municipalities are so exceptional that they cannot be copied in other rural localities, they see that the initiatives are not significant enough to encourage youth to stay in the village: "[...] it is difficult to say that it prevented outflow of young people from rural areas or encouraged their return and inflow", which seemed to be one of the main goals of the smart village concept in its initial stages of development.

4.3.4. Stimulating local activity, support for leaders

The local governments focus on their own tasks and they are also limited by statutory competences and the budget. Support for NGOs is provided first and foremost through subsidies to the outsourced tasks. The *sołectwo*, in turn, has its instrument i.e. the *sołectwo* fund which can be increased year by year. The local authorities draw attention to the fact that the initiatives undertaken are important and they support such initiatives. However, they often have limited funds and therefore are unable to support all of the projects directly. The respondents confirm in unison that municipal governments support local activity if such support is needed – in accordance with the subsidiarity principle. Moreover, they underline that the initiators must be, first of all, listened to, and if they have some needs or expectations, these must simply be fulfilled, because they are not "some lofty ideas or expectations but rather essential things that are needed". Secondly, they should not be meddled with – if they have some idea, let them apply it according to their original plan. One of the initiators, when holding the function of head of the rural municipality previously, encouraged people at that time to establish associations and to "take matters into their own hands", by supporting initial stages of association establishment. She noticed that thanks to

such an approach "the sense of empowerment grows, [...] and it has an impact on residents' greater engagement".

From the point of view of the local government, support involving the simplification of procedures for obtaining external funds for a given initiative can be of help to the leaders. In the opinion of one of the respondents, excessive administration is a constraint to more intense activity on the part of rural inhabitants. This is confirmed by what the initiators say: "you demand things from us of which we have no knowledge and this discourages us". Others add: "we have ideas for the subsequent smart solutions but when we have to travel, justify, copy, write and attest to something, we simply don't feel like doing all this". The initiators obviously do not always have to know the procedures or do not necessarily need to know legal and administrative principles of drawing up applications. This is why, as one representative of the local government says, "the simpler the procedures, the more the initiators can do, the less they will write and settle funds, which might result in a growing number of leaders."

Some local government officials underline that local leaders and associations should seek funds themselves: "municipalities have their own units which are responsible for projects implemented in municipalities, and if somebody comes with a request for an opinion on some initiative, the municipality will always respond, but an officer neither writes nor justifies nor signs off on a project". However, the local authorities offer support, e.g. they persuade people to establish local action groups and associations. Local government officials agree that "the local action groups know the environment and know who needs what more or less. They know how to distribute the funds and we have never had any problems with funds settlement". They point out that the implementation of the initiative encourages other groups and entities to take new actions. Of importance is the initiator's personality along with the final effect which will influence the involvement of inhabitants and networking between the *sołectwos*.

Local government officials often indicate that the initiatives enable greater mobilisation of local communities, that thanks to the projects implemented "stronger bonds" are formed and the community is integrated. Many times they show that the initiatives encouraged the non-participating residents to subsequent actions related to education as well as the creation of solutions influencing the environment or quality of life. However, as some of them underlined, not all the inhabitants wanted to make use of the bottom-up initiatives. Those who have a sceptical attitude do not take advantage of initiatives.

Although some local government representatives point out that "the leaders [...] largely have their own vision of rural areas and it is primarily up to them to create smart villages or to stall and stick to traditional development without the application of state-of-the-art technologies. The only possibility to support them is to point to opportunities, i.e. programmes from which they could obtain extra funding for their projects". It turns out that for local leaders such support in seeking funds is very im-

portant because they have ideas but they frequently do not know how to obtain funds in order to put them into effect. Although some of the leaders say that the best help "of local governments would be not getting in the way", it is the local governments that have power in terms of imposing taxes and they can shape local business and community activity with various financial instruments and application of tax exemptions and reductions in charges (cf. Łukomska et al., 2021).

The respondents expressed a quite common opinion that initiators' (local leaders) actions are complementary to local government measures, and therefore it is "worth supporting them (the leaders). Their work may be socially useful as in case of the hospice activity". Such an approach is adopted not only to that initiative. Also in other localities there is a strong feeling that actions may bring about positive effects. Unfortunately, in some cases beneficiaries indicate that the local leaders can potentially be competitors to local governments, so "support for initiatives may not always be to the local government's liking". They also expect that *sołectwos* or entities operating within their area will ensure the provision of information concerning the projects launched, even if formally no consent from the local authorities is required for such projects. It is insufficient information that causes discord and lack of trust, which could often be felt between active leaders and heads of villages/mayors.

As shown above, particular groups have different perspectives. Each participant in the smart rural development process points to different constraints as well as to different advantages and benefits of the actions taken. What is common to all the groups is the feeling that increased activity is key to enhancing quality of life in rural areas. This aspect, in turn, may be important for challenges faced by contemporary rural areas. It can also be a reason for staying in the rural areas and creating more resident-friendly places. If these conditions are fulfilled, then in the long term it can be a response to depopulation and demographic change, and a reason for supporting digital transformation or looking for alternative solutions that exploit the local possibilities and resources to implement tasks which have hitherto been assigned to public units.

5. INSTEAD OF A SUMMARY

5. Instead of a summary

Most monographs and scientific studies end with the section summarising the whole work. However, in our publication it will be a little different. Instead of a summary, we would like to answer the question: "Why is it worth creating smart solutions in villages?". And then confront it with the challenges faced by contemporary rural communities. Instead of conclusions from our research, we would like to present recommendations for the development of smart villages in Poland, which we made on the basis of the study conducted and our previous experience with this concept. We have divided these recommendations into three groups: for rural policies, for society and local government, for science and research.

We feel that this book is a testimony to the changing times. Polish villages, which have almost become an emanation of the fluid times in Zygmunt Bauman's deliberations, are also changing. They are no longer, as described by Jan Kochanowski in the "St. John's Eve Song", "Peaceful countryside, cheerful countryside...", in which the poet marvels at their beauty and idyllic character. Roadside shrines, grazing animals, storks, a patchwork of sown fields – this is just part of what is 'rural'. They are not typical agricultural villages either. For the first time the percentage of households generating their main income from hired work exceeded that of households generating their main income from farming. Polish villages are becoming increasingly modern, looking for new solutions to improve living conditions. And above all, they have aspirations that – as one of the respondents said – "life in rural areas could be a mark of quality rather than of shame". Residents of the villages surveyed have a sense of pride, pointing out that the initiatives implemented serve this purpose. Becoming smart in technological-infrastructural or agri-environmental dimensions is a response to the growing expectations of rural residents, who want their local governments to become more and more friendly to the inhabitants. However, in addition to solutions using various communication and digital means, social innovations appear in which technologies become only a tool, not an end in itself. These solutions very often become synonymous with contemporary smart villages.

As noticed in the Introduction, the rural development concept proposed by the European Union, *smart villages,* while addressed to villages 'in decline' due to progressive depopulation, it is not limited to those. Beneficiaries of smart villages may be communities in different locations characterised by various advantages and problems. These are the villages that exploit digital technologies and innovations in their daily life, thereby improving the quality of life, the standard of public services and making better use of the resources. As we have shown on the basis of a few initiatives, such villages do exist. The local authorities, leaders and residents want to change their living conditions. They do not want to wait passively for help, but they are responding to the challenges of the contemporary local development themselves. They are looking for solutions for that purpose. They establish associations, foundations and various organisations to be able to apply for larger and smaller funds.

We are aware that the initiatives included in the book represent only a small part of the actions taken in rural areas – over 170 ideas and initiatives were submitted to the two editions of the *My SMART Village* competition, and there are many that we do not know of. We want the examples provided to become a form of benchmarking, to show possible development paths. At the same time we would like to encourage you to search for your own solutions, bearing in mind local conditions and possibilities, exploiting the specific resources available in each village. We want people to learn from someone else's mistakes, not their own. We want the problems identified by the different groups surveyed to enable the development and implementation of initiatives "tailored to the needs" of specific localities.

5.1. Why is it worth creating smart solutions? – challenges for rural development in the future

As mentioned above, in the framework of our final deliberations we have decided to ask ourselves the question: "Why is it worth creating smart solutions?". The answer seems to be very simple – they allow for the enhancement of the quality of life and living standards in rural areas. However, such a simplification of economic and social issues of contemporary smart rural development cannot be sufficient. A deep insight into the problem enables us to see that the concept of smart villages can influence a number of factors, including:

a. increased awareness of sustainable development,
b. a reduction of disparities between urban and rural areas,
c. improvement of the quality of infrastructure and rural services
d. beneficial environmental changes,
e. spatial management and land use,
f. diversification of rural production,
g. improvement of public facilities' activity,
h. creation of new jobs,
i. establishment of social ties and collaboration between inhabitants,
j. digital transformation,
k. depopulation and ageing of the population.

At the same time, we are aware that the aforementioned factors do not exhaust all the problems and challenges to rural development in the future.

Creating smart solutions also means generating savings for the municipality in the long term and bringing tangible benefits to the environment. State-of-the-art technologies, such as LED street lighting and photovoltaics, enable a reduction in electricity costs without impairing the quality of the services provided.

We are posing an open question: "can smart solutions be a sufficient stimulus to stop depopulation of rural areas and the marginalisation of citizens living there?". We do not have a clear answer to this question. Despite the measures undertaken,

there is still a large disparity in living standards between urban and rural areas. This is a challenge for those who manage the area, for public institutions, social organisations or local community leaders. It should also be borne in mind that rural areas are no longer as closely linked to agricultural production as they once were. There is a need for an innovative look at rural areas as the future holds new expectations and challenges for them. These include the necessity to create support mechanisms for the development of renewable energy in rural areas. An extremely important challenge for the coming years, particularly in areas under the depopulation process, will be care services (Michalska et al., 2020). What is needed, therefore, is not only the development of technical infrastructure, but also a well-developed and efficiently functioning social infrastructure.

In order to understand the smart village concept, one needs to be open to society, to listen to the expectations and problems of the local community. Technology in the rural (as opposed to urban) concept is much more often a secondary issue, which is confirmed by our studies. In rural areas, attention is paid to solutions that improve the quality of life, which are not necessarily technologically advanced. People play a key role in the smart village concept. It is they who undertake the initiative and look for solutions to enhance the quality of life of the residents. It is necessary to search for practical solutions to important local social problems. Obviously, it is possible to take into account solutions that are already functioning in other countries, e.g. the *Strategy for Inner Areas* in Italy, services in Swedish peripheral areas or the Spanish legislation on sustainable rural development, but it is necessary to remember to take local possibilities into account. It is also possible to draw on Polish ideas by modifying them slightly in order to tailor them to the needs of a local community.

First and foremost, it is worth asking ourselves the question: "How can the knowledge of smart villages be used?". Here, too, the answer is quite simple, because smart villages are about future-oriented and state-of-the-art solutions, and these are usually worth paying attention to. The knowledge of smart villages will help develop local business (if we think about it in terms of individual benefits) and will enable the making of better strategic decisions at the local level (if we look at it from the perspective of the authorities). Such knowledge may also be crucial for the planned investments, e.g. in RES (renewable energy sources) installations at home. Depending on the needs, we can try to apply the selected idea and facilitate the life of residents in many villages. There is certainly no shortage of inspiration. However, it is worth drawing on the experience of those who have already succeeded – this is also the aim of our publication.

During the studies a question arose about the most important challenges/difficulties to smart development of rural areas. Based on our observations, it may be concluded that one of them is the absence of a leader who could pull together the local community and make the village develop smart initiatives. However, the municipalities selected for the study were fortunate to have a group of people who felt that the work and time

invested made sense. Financial difficulties are also crucial. However, where there are these leaders, many solutions that are favourable to development can be found. Looking for those aspects in which localities can be a model for others is extremely important. It is necessary to look for networks of mutual cooperation, so that we can draw on our own experience. It is indispensable to show others where the problems lie, where to look for funding of the solutions, and how to act effectively. Currently, a big challenge is the COVID-19 pandemic, which makes mobilisation of rural residents difficult. It turns out, however, that the pandemic is becoming a stimulus for new solutions that foster the development of digital activities and communication technologies.

The challenges of contemporary rural areas across Europe are similar. Most of these areas are grappling with similar problems: the outflow of young people, population ageing, the disappearance of basic services and a lack of funds for investment. The situation is no different in rural areas of Poland – especially in the east of the country and in areas remote from large cities. In this context, the threat of the "circle of rural decline" exists. By definition, the smart village concept is supposed to mitigate these negative trends. One of the tools is to be digital technologies and social innovations that contribute to enhancing residents' quality of life, improving accessibility and standard of public services as well as tapping into local resources in a better way. At the same time, the smart village concept is distinguished by its territorial sensitivity, which, simply put, means that actions are tailored to the needs of local communities at the lowest possible settlement level.

While considering the process of smart rural development, it is worth bearing in mind that the very term "Polish villages" is a certain simplification and it may be misleading for some readers. It is quite abstract, contains a certain generalisation, as it is difficult to say that there is a single model of the Polish village. It can be assumed that it is a certain aggregate combining various types of villages – from gentrified settlements, often located near large metropolises, to peripheral villages, distant not only from metropoles, but also from other county towns, with great transport problems, lacking social and technical infrastructure. As the study "Rural Development Monitoring" conducted by Monika Stanny et al. (2018) shows, there are many other types of rural areas in between. All this means that the instruments targeted at each of them must be different.

5.2. Recommendations for the development of the smart village concept in Poland

When making recommendations for the development of the smart village concept, we realise that we must formulate them very carefully. It is important to be aware of the fact that there are no universal approaches to the implementation of smart solutions, and each of them must be based on the needs and potential of a given area. On the basis of the studies conducted and our experience acquired during the implementation of other projects on the smart village concept, we have decided to publish recom-

mendations for further development of this concept in Poland. At the same time we feel that rural development is so fast that some of them may soon become outdated. Nevertheless, we believe that drawing up certain guidelines – for the coming weeks, months, and sometimes even years – will be a kind of a road sign for future actions taken in the European Union and national policies, by local governments as well as local communities, i.e. the final beneficiaries of smart solutions.

5.2.1. Recommendations for rural policies

1.

Conclusion → While conducting the studies, it turned out that not all rural residents had access to stable, reasonably fast internet. A smart/intelligent solution is not synonymous with the technologically advanced one – technologies are important tools, but they should serve a specific purpose.

Justification

Initially, smart villages were perceived as a testing ground for highly advanced technological solutions. However, currently the approach has become more community-oriented and technology is seen as an element facilitating the implementation of smart initiatives. However, there are many rural areas in Poland that are not covered by sufficiently fast internet, and some have even have problems with mobile phone coverage.

Recommendation

Continue to provide support for areas particularly digitally excluded in terms of ICT infrastructure in EU and national policies.

2.

Conclusion → The smart village concept is ready for the next stage – comprehensive financial support while maintaining flexibility and a bottom-up approach that characterises it.

Justification

Nearly each of the initiatives surveyed was connected with expenditure. This almost always turned out to be time consuming due to complex bureaucratic procedures. To continue bottom-up smart initiatives, which fit into smart village concepts of various villages, it is necessary to secure sufficient funds and establish friendly procedures.

Recommendation

Include the smart village concept in the "CAP Strategic Plan 2023-27", especially in the context of the LEADER/CLLD approach.

3.

Conclusion → Smart solutions sometimes require cooperation in order to respond to specific challenges and be able to implement them.

Justification

In interviews with the local leaders it transpired that, in some cases, in order to implement specific initiatives, cooperation was needed with the local government (some persons were of the opinion that without the involvement of the local government smart villages would not succeed, because it is the local government that provides a guarantee of funding e.g. their financial contribution), with a non-governmental organisation, a local action group or with businessmen. This cooperation also involves contact and exchange of experiences with other leaders.

Recommendation

Encourage the establishment of associations, local partnerships and support for exchange of experiences in the approach to smart villages in EU and national programmes.

4.

Conclusion → Each village is different due to geographical conditions (distance from the city) or socio-economic conditions and social structure.

Justification

The initiatives that were analysed during the study were located both in villages close to big cities and in rural areas characterised by low accessibility and low educational levels of their residents (theoretically they do not have great potential of their own to implement smart solutions).

Recommendation

Include multidimensionality and diversity of the smart village approach as well as the so called "territorial perspective" in various programmes and policies.

5.2.2. Recommendations for society and local government

1.

Conclusion → The smart solutions identified in Poland were financed from various sources: European, national, municipality, sołectwo funds, business.

Justification

The most active local leaders are skilled in obtaining funds from many different sources – this in itself demonstrates "cleverness" and many more opportunities to enhance the quality of life in rural areas. However, not all initiators have the competence and staff to write applications, settle funds and deal with other bureaucracy.

Recommendation

Maintain existing programmes and enrich the offer of training courses, workshops, study tours for local leaders and persons aspiring to become such leaders.

2.

Conclusion → The initiator of smart solutions is usually a local leader (head of the sołectwo, head of the municipality, councillor, etc.), very often alone in his action.

Justification

In the interviews smart village leaders mentioned the imminent burnout caused by the lack of support from the residents, association members, sołectwo council, etc. The majority of solutions was created only thanks to the involvement of an enlightened initiator – it should be recalled that there are about 40,000 sołectwos in Poland and good examples presented in this book are only a "drop in the ocean".

Recommendation

Run an information campaign, workshops and to take other promotion measures on the activity of local governments, sołectwos, third sector and broadly understood public participation.

3.

Conclusion → The need for flexible support was stressed in the interviews – most often local governments' funding for the emerging innovative actions.

Justification

The implementation of smart solutions required financial and sometimes material support. The funds from the sołectwo budget could not always be used. Therefore, it happened that funds for the implementation of the initiative were collected from the residents willing to make contributions or a given action was financed from the initiator's own funds.

Recommendation

Establish a special system of funding in municipalities which would enable the implementation of bottom-up smart solutions that facilitate support for local leaders' actions.

4.

Conclusion → Motivating people to learn about new technologies and innovative devices may have a decisive impact on the development of the smart village idea.

Justification

There still appear to be residents who do not use the internet, although they have access to it. Most often they still use fixed line phones and contact with them is difficult. This is especially the case with older people. It is necessary to provide education so that the residents will get to know and understand ICT and, in consequence, will be able to use it.

Recommendation

Provide training, workshops in order for residents to acquire new digital competences; hold awareness-raising talks with the local community about the advantages of new technologies and provide training in cybersecurity.

5.

Conclusion → Small villages have difficult access to EU programmes, and local leaders point to cumbersome bureaucracy while seeking to obtain external funds.

Justification

Not every leader has experience in seeking EU funding or knows the procedures to be followed. There were also situations when a local activist had an idea for a smart solution, but gave up on seeking external funding because of his/her fears.

Recommendation

Provide support from municipality employees with a view to finding an appropriate fund and going through the procedure. Support provided by qualified experts would make local leaders' work easier.

6.

Conclusion → Residents do not know what smart villages are, but they are aware of their own needs.

Justification

While conducting the interviews, it turned out that a large part of the residents (e.g. farmers, members of rural homemakers' clubs) had a problem answering the question whether their village was smart. The inhabitants had not heard of smart villages. Even for those participating in the smart initiative, it was difficult to define it. However, those taking part in the study were able to point to the initiatives implemented which were key to the residents' quality of life.

Recommendation

Disseminate the assumptions behind the smart village approach among residents and carry out activities promoting and explaining the concept.

7.

Conclusion → Leaders and initiators have a feeling of being alone.

Justification

Recognition, appreciation and promotion by the local government of the smart initiatives implemented in a particular village may help involve the residents in subsequent actions, will enable them to appreciate the leader's efforts and will shed light on other, still unsolved local problems.

Recommendation

Reward and promote leaders and local communities that make smart changes.

8.

Conclusion → It is important that a smart initiative be launched starting from one, even small, action. The point is not to become discouraged. Other leaders' ideas can be applied, but the needs of the local community must always be taken into account.

Justification

Not all initiatives can be automatically replicated. This is due to the specific features of a particular village. The point is to use the local resources (natural, man-made) and social values (culture and tradition) in a development-oriented way.

Recommendation

Analyse the situation and improve what exists in a particular village as an impulse for change supported by a thought-over strategy/concept of rural development following the smart village trend.

5.2.3. Recommendations for science and research

1.

Conclusion → Smart villages already do exist, however they very often do not identify themselves as such.

Justification

While conducting the interviews, it turned out that even if the respondent had not heard about smart villages before, the projects discussed complied with the assumptions underlying this concept. This is partly due to what has already been described in the theoretical part – smart villages is a relatively new approach to rural development which is in the phase of conceptualisation and is insufficiently recognised in practice.

Recommendation

Allocate extra funds for research on the smart village concept in social, agricultural as well as engineering and technological sciences.

2.

Conclusion → There is no single way to "be" smart, but the catalogue of rural residents' needs, although open, can be regarded as containing a dozen or so thematic issues.

Justification

The breakdown of the surveyed smart initiatives into three categories: 1) infrastructural and technological; 2) social; 3) agricultural and environmental allowed for structuring the study. However, it transpires that initiatives are very diversified within these classes (e.g. in terms of spatial coverage, cost intensity, civic participation, effects and sustainability), and what is more, they intertwine. The reader may get the impression that an initiative we describe, classified e.g. into environmental solution, complies with the assumptions of a social solution as well as a technological one equally well, of which we are aware.

Recommendation

Expand the stock of smart initiatives through measures (scientific investigations, competitions, conferences, etc.) addressed to local communities, aimed at sharing good practices.

It is worth remembering that Polish villages are using smart solutions to an increasing extent. We realise that the recommendations put forward here do not make up a complete set and they do not exhaust all themes or issues. They are mainly addressed to leaders, local authorities, but also state authorities and, what is important, they do not solve all the problems related to smart solutions in rural areas. We do not exclude the possibility that as we gain new experience with smart villages, these recommendations will either lose their validity, be modified in the future, or be extended to include new issues that will arouse our interest.

New initiatives and ways of solving problems emerge that previously could not be implemented or were implemented only to a limited extent. We are observing continuous rural development because residents want the standard of living in villages to be at least the same as in cities. Simultaneously, we can speak of the development of both the smart village concept and the related research. This also applies to the ideas arising from the concept in different villages. It may be assumed that some villages inspire others with their ideas. They show that it is worth being smart, because such ideas contribute to improving the standard of living in a given area, but they can also be implemented with the European Union's support through various funds. It is important not to think in a stereotypical way, but to seek solutions that result from local opportunities and local resources. It is also important for local communities to take matters into their own hands, to make use of the willingness of local leaders, and then to create micro-solutions so that villages become friendly to residents.

It is with great satisfaction that we present to you our publication on smart issues in rural areas. Despite the pandemic, we have managed to finish the study and share our findings. Taking into account of our experience so far, we are glad that more and more smart initiatives are emerging and this topic is becoming increasingly popular in Poland. We hope that you will find the book inspiring and that it will dispel at least some of your doubts and that, as a result, the idea of smart villages will be better understood. We hope that the book will make you aware how important the changes and choices we are making for local communities are.

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