It's Not a Fad: Smart Cities and Smart Villages Research in European and Global Contexts

Anna Visvizi [1,2,*] and Miltiadis D. Lytras [1,3]

1   School of Business, Deree College—The American College of Greece, 153-42 Athens, Greece; mlytras@acg.edu
2   Effat College of Business, Effat University, P. O. Box 34689, Jeddah, Saudi Arabia
3   Effat College of Engineering, Effat University, P. O. Box 34689, Jeddah, Saudi Arabia
*   Correspondence: avisvizi@acg.edu; Tel.: +30-210-6009800

Abstract: Research on smart cities matures and new interdisciplinary approaches to the study of smart cities are proposed. At the same time, problems pertinent to communities inhabiting rural areas tend to be addressed, as if by the way, i.e., as a part of discussions in neighboring fields of research, be it environmental studies, sociology, or agriculture. Arguably, the concept of 'the village' has been largely absent in the academic debate, even if rural areas and countryside communities have been a subject of concern for robust policy frameworks, such as the European Union's Cohesion Policy and Common Agricultural Policy. As a result, when advances in sophisticated information and communication technology (ICT) led to the emergence of a rich body of research on smart cities, the application and usability of ICT in the context of a village remained underdiscussed in the literature. Through this Special Issue, and the Editors' earlier research on this topic, the Editors hope that the idea of the 'smart village' will be introduced into the debate. Against this backdrop, the objective of this opening review is three-fold: (i) to outline the conceptual boundaries of the term *smart village*, (ii) to highlight the thrust of the challenge inherent in *smart villages research*, and (iii) to shed light on the *smart village research* agenda as it unfolds. The relevance and validity of these claims are supported by references to research submitted to the Special Issue titled "Sustainable Smart Cities and Smart Villages Research".

1. Introduction

Research on smart cities matures and new interdisciplinary approaches to the study of smart cities are proposed. At the same time, problems pertinent to communities inhabiting rural areas tend to be addressed, as if by the way, i.e., as a part of discussions in neighboring fields of research, be it environmental studies, sociology, or agriculture. Arguably, the concept of 'the village', as an independent subject of inquiry, has been largely absent in the academic debate—even if rural areas and countryside communities have been a subject of concern for robust policy frameworks, such as the European Union's Cohesion Policy and Common Agricultural Policy. As a result, when advances in sophisticated information and communication technology (ICT) have led to the emergence of research on smart cities, the application and usability of ICT in the context of a village remained underdiscussed in the literature. Today, this Special Issue, and related research [1], essentially introduce the idea of the 'smart village' into the debate. Against this backdrop, the objective of this opening review is three-fold: (i) To outline the conceptual boundaries of the term smart village, (ii) to highlight the thrust

of the challenge inherent in smart villages research, and (iii) to shed light on the smart village research agenda as it unfolds.

2. The Conceptual Boundaries of the Smart Village

The conceptual boundaries of the smart village are defined by the following assumptions and claims: (i) A village is an ecosystem of a limited size, a community that is driven by specific mechanisms and dynamics that are the product and the outcome of multi-level interaction among all stakeholders. (ii) Smart village is conceptually different that the aggregate construct of a 'rural area' or 'country side'. (iii) A village is conceptually and empirically distinct, and so the question of and corresponding research on the value-added ICT can garner in the space of a village has its own characteristics, different from research on smart cities. (iv) By focusing on a village as a concept ontologically different from that of a city, a way is paved to smart villages research as a field separate from smart cities research. (v) By reifying the village in the analysis, the focus of analysis in smart village research shifts to inhabitants of a given village, be it plural or individual. What follows is that (vi) the delimited research on smart villages employs insights from the debate on ICT, to engage in conceptually-sound, empirically-focused, and ethically-conscious exploration of problems, challenges, and opportunities that villages and their inhabitants incur in the 21st century.

In this view, smart villages research has a very strong pragmatic orientation in that it seeks to diagnose a problem and, by reference to ICT, offer a way of bypassing it. Accordingly, an opportunity is created for research on smart villages to go beyond the ICT-hype and embark on a problem-driven, solution-oriented, pragmatic research. In this way, research on smart villages stands to avoid the loop of 'normative bias' [1] characteristic to considerable body of smart cities research. Indeed, all too frequently, research on smart cities builds upon the assumption that smart city services will contribute to wellbeing and quality of life of cities' inhabitants, thus disregarding the basic fact that the assumed users of services that advances in ICT make feasible are unwilling or unable to use them [2]. If the sustainability of research on smart cities is a function of its relevance and usability, then more pragmatism needs to be induced into this research [2]. As research on smart villages is still nascent, and its disciplinary origins different than those of smart cities, the prospect is that, by focusing first, on problems and challenges villages face, and only afterwards on what ICT can offer, the temptation to do the opposite might be prevented.

3. Challenges, Opportunities and the Value-Added of Smart Villages Research

The focus of this Special Issue has a pragmatic background, derived from the Guest Editors' field research in the Greek province. The outcomes of that research suggested that Greek villages (frequently considered outspokenly beautiful, by all international standards) are depopulating at an alarming pace and that, if no action to reverse that tendency is taken today, there will be no villages in 10 years from now. The relevance of this topic across the Europe and elsewhere has been confirmed by the number of submissions to this Special Issue, and the need to launch another one. Moreover, the topicality of issues covered by the initial call for papers has been reaffirmed by a similar initiative launched nearly concurrently by the members of the European Parliament. This initiative led to the signing of the Bled Declaration for a Smarter Future of the Rural Areas in EU in April 2018 [3]. Hopefully, the voices of academia and policymakers will merge now to mutually reinforce each other, for the sake of villages and the wellbeing of their inhabitants.

Clearly, research on smart villages is not geared solely toward addressing the problem and implications of decreasing populations in villages. However, depopulation seems to be the most poignant challenge of all as it bears several implications. This needs to be addressed as soon as possible if their adverse outcomes are to be preempted. The temporal dimension in the discussion on smart villages is vital; it highlights the issues at stake and the urgency of the matter. The list of challenges and issues is long, but they all form a logical thread. The following is a brief typology of issues and challenges, and the corresponding urgency of action (see Table 1).

Table 1. Smart villages: typology of challenges and the corresponding urgency of action.

	Temporal Dimension	Status of the Challenge	The Thrust of the Challenge	Prescribed Action	Type of Action
1	Short-term	Emergency	Question of life and death, incl. safety and security	Action needed at this moment	What smart services, provided by whom, how and at what cost could be provided to ease the situation?
2	Mid-term	Urgent	Question of wellbeing and quality of life	Planning and action need to begin today, action needed today	
3	Long-term	Very important	Question of cultural heritage, governability, the cost of inaction	Planning needs to begin today, action needed in the near-future	

Short-term challenges: Emergency, i.e., action is needed at this moment: Depopulating villages tend to be inhabited by elderly people, usually single, in need of medical care, help with cooking and food preparation, and simple company. These people tend to be deprived of the means for living, and can hardly use electronic devices (should internet and electricity be available in their village). The nature of this challenge goes beyond the question of wellbeing and quality of life. It is in fact a question of life and death; a question of these citizens' safety. Risks to their safety include the risk of burglary, assault, fire, and flooding. What smart services, provided by whom, how and at what cost could be provided to ease the situation?

Mid-term challenges: Urgent, i.e., planning and action need to begin today, action is needed today: Depopulating villages frequently lack basic infrastructure, such as roads, reliable electricity grids, doctor, school, affordable groceries. This affects the wellbeing and quality of life in villages for its current inhabitants. It also creates disincentives for possible newcomers, and incentives for current inhabitants to leave. What smart services, provided by whom, how and at what cost could be provided to ease the situation?

Long-term challenges: Important, i.e., planning needs to begin today, action is required in the near-future: Depopulating villages frequently embody artefacts of inimitable cultural heritage, in terms of architecture, tradition (rites, habits), and oral history. After a village's current population is gone, so is that cultural heritage. Long-term implications of increasingly depopulated villages and rural areas highlight the question of the state's ability to exert its control over those areas. Practice suggests that organized crime tends to thrive under those conditions. As long-term implications are diverse, the bigger question here is what the cost of today's inaction is, and what can be done today to limit that cost tomorrow. Again, the question is: What smart services, provided by whom, how and at what cost could be provided to ease the situation?

Arguably, the downside of rapid urbanization is depopulation of rural areas. Life in cities seems to bear greater promise than in the countryside, and so the romanticized image of pastoral village life fades. Certainly, the problem of depopulation of rural areas has several facets worldwide—it displays diverse dynamics, and clearly several country- or region-specific factors contribute to its evolution. In other words, research on smart villages should be geared to questions of declining quality of life and wellbeing, the emergence of risks to safety and security, growing inequalities, and other externalities in the form of strain on cultural heritage, environment, the cost of non-growth, and lost opportunities in general. In this view, the unique value proposition inherent in the concept of smart village is that it seeks to do much more than to showcase how sophisticated ICT can be employed in a village context. Research on smart villages is meant to address a variety of issues and problems, which inhabitants of villages face in the 21st century. Notably, these issues and problems are qualitatively different than those cities' inhabitants experience daily. This research is meant to trigger debate that will lead to evidence-based coherent strategies and action-plans designed to address short-, medium- and long-term challenges that villages face.

4. How Research on Smart Cities Can Fertilize Research on Smart Villages?

As argued elsewhere significant differences exist between the research on smart cities and smart villages [1], yet both fields can benefit from each other. This review seeks to delineate the conceptual boundaries of the concept, and shed light on the corresponding field of research, while highlighting issues and topics that should be prioritized in research and policymaking. The twenty-four papers included in this Special Issue offer a good insight into which directions the research on smart villages might follow in the future. These issues and topics include:

- How to pre-empt nascent risks and threats in villages by mapping, planning, and managing the development of villages and rural areas?
- How to address challenges to wellbeing and quality of life in villages?
- What is the value-added of the big data paradigm in the smart village context and how to exploit this value responsibly?
- How to maintain and promote environmental sustainability in the smart village context?
- How to promote socio-economic sustainability in the smart village context?
- How to account for and conceptualize of transformation and change in the smart village context?

The following sections details how papers included in this volume add to the debate and how smart villages research may benefit from them. In the final section the emerging issues are outlined.

4.1. How to Pre-Empt Nascent Risks and Threats in Villages by Mapping, Planning and Managing the Development of Villages and Rural Area?

These questions, still in connection to cities and urban areas, have been addressed in detail by several authors contributing to this Special Issue.

Patrik Silva and Lin Li, in their paper titled "Mapping Urban Expansion and Exploring Its Driving Forces in the City of Praia, Cape Verde, from 1969 to 2015" [4], pay attention to the impact of urban expansion on the natural environment. By examining the case of Praia, the capital city of Cape Verde, over the period 1969–2015, their paper offers a very detailed insight into how urban planning and policy making can balance urban economic development and natural resource protection in locations as specific as that of the city of Praia.

The implications of "Accelerated Urban Expansion in Lhasa City and the Implications for Sustainable Development in a Plateau City' are discussed by Wei Tang, Tiancai Zhou, Jian Sun, Yurui Li and Weipeng Li [5]. They explore the question of challenges urbanization causes for a plateau city of Lhasa. By examining the determinants of the urban development process, the authors provide insightful suggestions for urban management and planning for Lhasa.

Elmira Jamei, Michael Mortimer, Mehdi Seyedmahmoudian, Ben Horan and Alex Stojcevski focus on the application of virtual reality (VR) solutions in the context of smart cities [6]. In their paper, titled "Investigating the Role of Virtual Reality in Planning for Sustainable Smart Cities", the authors review the capacity of VR to address current challenges in creating, modelling, and visualizing smart cities through material modelling and light simulation in a VR environment. Their study can assist urban planners, stakeholders, and communities to further understand the roles of planning policies in creating a smart city, particularly in the early design stages.

4.2. How to Address Challenges to Wellbeing and Quality of Life in Villages?

Kevin Dean, Claudia Trillo and Erik Bichard, in their article titled "Assessing the Value of Housing Schemes through Sustainable Return on Investment: A Path towards Sustainability-Led Evaluations?", look closely at the link between environmental and social sustainability in urban spaces. From this perspective they look at the issue of housing in cities [7]. To this end, they demonstrate how sustainable return on investment can successfully describe and analyze a range of externalities, related to the sustainable value generated by social housing regeneration schemes.

José Maria Codosero Rodas, José Manuel Naranjo Gómez, Rui Alexandre Castanho and José Cabezas, in their paper titled "Land Valuation Sustainable Model of Urban Planning Development: A Case Study in Badajoz, Spain", explain that urban planning development process in urban territories has multiple consequences, not only in spatial structure but also in land valuation patterns [8]. The economic value of land encompassed in municipal planning, which is associated with a certain urbanized use, increases as the planning processes evolve over these lands. The land valuation model they develop may be of use also in the context of smart villages research as a piece and parcel of a greater strategy aimed at boosting development and growth in a given village.

Jin-Wook Lee and Jong-Sang Sung in their paper titled "Conflicts of Interest and Change in Original Intent: A Case Study of Vacant and Abandoned Homes Repurposed as Community Gardens in a Shrinking City, Daegu, South Korea", take a very rare view of the issue of gardens in the context of a smart city [9]. By focusing on an urban policy designed to revive South Korea's shrinking cities, vacant residential structures are being demolished and the resulting empty plots transformed into public spaces. The authors examine this process through the lens of conflicts it ignites. They argue that to overcome problems caused by rivalry and discord, the following actions are required: A change in perspective among policy practitioners; a governance structure that consists of a public/private/community partnership; consensus among community members; and equitable welfare through programs based on inclusivity and public interest.

Kwok Tai Chui, Wadee Alhalabi, Sally Shuk Han Pang, Patricia Ordóñez de Pablos, Ryan Wen Liu and Mingbo Zhao in their work titled "Disease Diagnosis in Smart Healthcare: Innovation, Technologies and Applications", argue that smart city implies a global vision that merges artificial intelligence, big data, decision making ICT, and the internet-of-things (IoT). In their paper, disease diagnosis in smart healthcare is reviewed and examined in the context of smart cities [10].

4.3. What Is the Value-Added of the Big Data Paradigm in the Smart Village Context and How to Exploit This Value Responsibly?

Shiann Ming Wu, Tsung-chun Chen, Yenchun Jim Wu and Miltiadis Lytras, in their paper titled "Smart Cities in Taiwan: A Perspective on Big Data Applications", examine the development of smart cities in Taiwan. The authors offer a detailed insight into how big data may be useful in this regard [11].

From a different angle, by reference to Business Performance Management (BPM) technologies, Bram Pieket Weeserik and Marco Spruit, in their paper "Improving Operational Risk Management Using Business Performance Management Technologies", make a case for the use of big data to manage operational risk. They argue that several combined technologies, including work flow, data warehousing, (advanced) analytics, reporting, and dashboards, can be integrated with an organization's planning and control cycle and related to strategic objectives, thus substantially easing the operational risk [12].

Radek Doskočil and Branislav Lacko, in their paper "Risk Management and Knowledge Management as Critical Success Factors of Sustainability Projects" examine the key aspects of sustainability projects, namely advanced risk management and project knowledge. The authors research, based on a thorough examination of projects implemented in the Czech Republic, confirms the arguments outlined in the previous paper, and thus allows to make a case for advanced risk analysis methods [13].

Lihuan Guo, Dongqiang Guo, Wei Wang, Hongwei Wang and Yenchun Jim Wu, look into crowdfunding [14]. In their paper titled "Distance Diffusion of Home Bias for Crowdfunding Campaigns between Categories: Insights from Data Analytics", the authors examine online crowdfunding campaigns and specifically investors' behavior as seen from the home bias perspective. The value of this study for the field of research on smart villages is that since it provides a theoretical basis to examine online investment and to improve the promotion of crowdfunding campaigns, it could be of great use for smart village oriented crowdfunding campaigns.

4.4. How to Maintain and Promote Environmental Sustainability in the Smart Village Context?

These four papers that address the question of environmental sustainability and/or energy efficiency focus predominantly on cities/urban areas. However, issues that each of these papers dwells on and research findings can well be applicable in the smart villages context, be at the micro-level of increasing energy efficiency of public utility buildings, decreasing energy cost for individual consumers or improving the overall environmental profile of a municipality.

Specifically, Samuel de Alencar Bezerra, Francisco Jackson dos Santos, Plácido Rogerio Pinheiro and Fábio Rocha Barbosa in their article titled "Dynamic Evaluation of the Energy Efficiency of Environments in Brazilian University Classrooms Using DEA", focus on the question of whether energy efficiency of indoor spaces can be improved [15]. By the same token, Jaclason M. Veras, Igor Rafael S. Silva, Plácido R. Pinheiro and Ricardo A. L. Rabêlo, examine the question of consumers' energy consumption profiles in view of minimizing the electricity costs for the final consumers [16]. In their paper titled 'Towards the Handling Demand Response Optimization Model for Home Appliances", the authors suggest that decrease in the electricity cost is possible.

In their paper "Digitalization and Environmental Aims in Municipalities", Tina Ringenson, Mattias Höjer, Anna Kramers and Anna Viggedal examine how digitalization can aid municipalities to achieve environmental aims. By reference to two EU directives that are relevant for municipal environmental goals, the authors suggest how to reach the directives' goals and hence attain the goal of more environmentally savvy performance at the municipality level. Even if, as the authors note, much more needs to be done to encourage dialogue among municipalities and ICT developers, the content of the paper is of particular relevance for smart villages research [17].

From a different perspective, Chien-wen Shen, Phung Phi Tran and Pham Thi Minh Ly "Chemical Waste Management in the U.S. Semiconductor Industry", highlight the problem of managing high-purity organic and inorganic compounds involved in manufacturing of semiconductors. As they note, the outcomes of their study are of great value for city governments as they try to employ suitable policies to reduce the negative impacts of the chemical waste from regional semiconductor companies [18].

4.5. How to Promote Socio-Economic Sustainability in the Smart Village Context?

The question of socio-economic sustainability in a smart village context is perhaps one of the key issues that define the prospect of survival of a given village community. More research pertinent to this question is needed if the general question of smart villages sustainability is to be effectively addressed. At the moment, the Special Issue reviewed here features three papers that deal with that imperative, either directly, as in the case of sustainable farming in Spain, or indirectly, by exploring different forms of business organization, such as social enterprise, or by rethinking the spatial organization of production. Each of the papers discussed briefly beneath offers an important insight of great value to the smart villages debate.

Carmen De-Pablos-Heredero, Jose Luis Montes-Botella and Antón García-Martínez in their paper titled "Sustainability in Smart Farms: Its Impact on Performance" explore the question of sustainability in farms. Their research suggests that farms face tremendous challenge of failing sustainability. By reference to selected case-studies from Spain, the authors suggest how the challenge can be bypassed [19]. Certainly, smart villages and the production process is not only about farming. Social enterprises might be one of the alternatives to employment suitable in the smart villages context.

Yung Chang Wu, Yenchun Jim Wu and Shiann Ming Wu examine social enterprises and their role in economic development in Taiwan [20]. By showcasing the intricacies of social enterprises, the paper titled "Development and Challenges of Social Enterprises in Taiwan—From the Perspective of Community Development", may in fact offer useful cues into how to transpose the concept of social enterprise into the context of smart village.

Yizhou Wu, Peilei Fan and Heyuan You, in their paper titled "Spatial Evolution of Producer Service Sectors and Its Influencing Factors in Cities: A Case Study of Hangzhou, China", examine the

connection between location changes and the motives of producer service sectors in cities. Given the rapid development of producer service sectors in developing countries, this study examines changes in the distribution of producer service sectors over the past decade and factors influencing them in a case study using the city of Hangzhou in China. Results show that Hangzhou's producer service sector is still mainly concentrated in the central business district (CBD). However, a distinct trend of diffusion to suburban areas was observed, which formed several secondary clusters on the periphery of the city [21].

4.6. How to Account for and Conceptualize Transformation and Change in the Smart Village Context?

Urban space is subject to continuous transformations. Advances in ICT and the resulting smart cities research are part of these transformations as they influence both the city space and its inhabitants, as well as, unavoidably, the institutions of social interaction.

José Luis Carrasco-Sáez, Marcelo Careaga Butter and María Graciela Badilla-Quintana explore the transition of cities towards what they term 'smart human cities'. Their paper, "The New Pyramid of Needs for the Digital Citizen: A Transition towards Smart Human Cities", examines how the cultural transition towards knowledge society impact citizens' expectations regarding what a given city should provide. The authors argue that this transition is characterized by a growing diversification of the use of technologies in most of the economic, political, educational, social, and cultural activities of different human groups [22].

Jintao Li, Yuanyuan Yang and Ning Jiang, in their paper titled "County-Rural Transformation Development from Viewpoint of "Population-Land-Industry" in Beijing-Tianjin-Hebei Region under the Background of Rapid Urbanization", the authors focus explicitly on the question of rural transformation and its implications. They examine the spatial-temporal characteristics of county-rural transformation development through drawing into the transformation degree (TD) and coordination degree (CD) from the viewpoint of "population-land-industry" (PT-IT-LT) in the Beijing-Tianjin-Hebei region [23].

Libang Ma, Xiaodong Guo, Yaya Tian, Yongli Wang and Meimei Chen discuss the outcomes of a "Micro-Study of the Evolution of Rural Settlement Patterns and Their Spatial Association with Water and Land Resources: A Case Study of Shandan County, China". They argue that the balance between population, and water and land resources is an important part of regional sustainable development. It is also significant for the ecological civilization in China and can help solve 'the three rural issues' (agriculture, countryside and farmers) in China. In their paper, they examine the temporal-spatial differentiation of rural settlement patterns in Shandan County of Hexi Corridor and study the spatial association between rural settlements and water-land resources [24].

Hege Westskog, Tanja Winther and Marianne Aasen, in their paper titled "The Creation of an Ecovillage: Handling Identities in a Norwegian Sustainable Valley", explore the question of the making of an ecovillage. As the authors argue "the concept of ecovillage is continuously refined both internally on an individual level and in the village, and in mainstream society. At stake is the question of ecovillage identity and what this should entail" [25].

The practice-driven discussion in the Special Issue reviewed here culminates in the paper titled "Smart Villages: Comprehensive Review of Initiatives and Practices". The authors, Veronika Zavratnik, Andrej Kos and Emilija Stojmenova Duh, map the most recent initiatives geared toward implementing the concept of smart village in the EU context [26].

5. Smart Villages Research: Defining the Research Agenda

As the body of research on smart cities matures and gradually displays its own methodological and research toolkit, a very specific set of questions is subject to academic debate. Even if, what we term, an interdisciplinary turn in the research on smart cities is under way [1,3], and paves the way toward more interdisciplinary approaches in smart cities research, this research represents a relatively well-delineated field. To retain its sharpness, relevance and usability, a careful reflection on the research

agenda is needed today. Indeed, Miltiadis Lytras and Anna Visvizi, in their paper titled "Who Uses Smart City Services and what to Make of It: Toward Interdisciplinary Smart Cities Research", make a case for interdisciplinary smart cities research. The authors look at the smart cities debate from the complex perspective of, on the one hand, citizens' awareness of applications and solutions considered 'smart' and, on the other hand, their ability to use these applications and solutions. Drawing from the outcomes of their empirical research, the authors argue that more pragmatism needs to be induced in smart cities research if its findings are to remain useful and relevant for all stakeholders involved [2].

In this context, smart villages research is a newcomer, that has the option to bypass the weaknesses that are specific to smart cities research. The six issue areas that the papers included in this Special Issue explore do not exhaust the topic. Table 2 offers an overview of these issues, and demonstrates that these should always be seen as a function of the specific challenge at hand and its urgency. Similarly, Table 2 outlines that a variety of ICT-enhanced ways of addressing a given challenge may exist, yet, there is no *one size fits all* solution. Policies and strategies need to be evidence-based and coherent, ye, different, actors and stakeholders will deal with them differently. Responses will vary depending on the issue area. Ethical considerations will have to be taken into account too. Overall, the so defined field of smart villages research is complex and fertile.

Table 2. Smart villages research: The emerging research agenda.

Nature of the Challenge	Key Research Questions	ICT-Enhanced Strategies	Policy-Frameworks and Strategies
Questions of life and death	How do we pre-empt nascent risks and threats in villages by mapping, planning and managing the development of villages and rural areas?	big data, data analytics, data mining, sensors, virtual reality, augmented reality, 5G technologies	dialogue and evidence-based policymaking
	How do we address challenges to wellbeing and quality of life in villages?		actors/stakeholders
Questions of wellbeing and quality of life	What is the value added of big data in smart village context and how do we exploit this value responsibly?		sources of funding
	How do we maintain and promote environmental sustainability in the smart village context?		ethical dimension
Questions of preservation of cultural heritage, governability, cost of inaction	How do we promote socio-economic sustainability in smart village context?		data analytics
	How do we account for and conceptualize of transformation and change in the smart village context?		emerging issues

Advances in ICT, including big data, data analytics, data mining, sensors, virtual reality, augmented reality, 5G technologies, etc., redefine the landscape of our daily life. They have profound impact on how we live, work, spend our free time, travel. They influence the way we receive our medical treatment, the degree of safety we experience (not only online), the way we communicate, etc. Arguably, this snapshot of applications will be equally relevant in villages too. The concept of the smart village and, indeed, the smart village research agenda, goes beyond the techno-hype. Research on smart villages derives from a genuine concern for the fate of villages, be it in Europe or elsewhere, and their inhabitants. It builds on the conviction that ICT may be a part of greater strategies aimed at addressing challenges and problems villages and their inhabitants face on a daily basis. Smart villages research reifies the village and its inhabitants as an independent subject of research, ontologically distinct from smart city. Smart villages research draws on the experience and body of findings pertinent

to smart cities research. At the same time, it benefits from fields largely irrelevant in debates on smart cities, such as farming and agriculture, to mention just the most obvious ones.

The excellent contributions from all over the world included in this Special Issue highlight diverse issues and topics that form the evolving fields of smart cities and smart village research. Thanks to this Special Issue, a substantial streamlining of research on smart cities has been promoted, while the concept of smart villages, smart villages research focus and smart villages research agenda have been delineated. Today, the imperative is to encourage research geared toward developing smart villages research own sound methodological and conceptual toolkit apt to explore issues and challenges villages and their inhabitants face. It's not a fad. These challenges and problems are real.

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