

**SMART VILLAGES IN THE EU AND  
BEYOND**

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# SMART VILLAGES IN THE EU AND BEYOND

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## Editors' Preface

Connecting the slopes of a valley hidden in the mountains of Arcadia (Peloponnese, Greece), the arch bridges in Fouskari stretching over the waters brought by three springs, are suggestive of how life might have looked like just a few decades back. The stone-curved aqueducts and tiny water basins remind us of the lifestyle and hardship the village inhabitants endured. But the view of the green slopes of the valley also seem to be reviving the laughter of girls and women meeting here in the past to do laundry or take a bath. *Et in Arcadia Ego* is a potent title of a seventeenth century painting by Nicolas Poussin. The idyllic representation of shepherds and the mystery that the painting conveys remind us of Virgil's *Arcadia* and the archetypal pastoral milieu. Explored and described by Pausanias (110–180 AD), a land filled with treasures still waiting to be explored, Arcadia is a land bursting with myths of Gods, nymphs, and good charms. Located in direct vicinity of Ancient Olympia, it is a land poignant with thousand years of history, heroism, and courage curved in the walls of abandoned castles, and told over and over again by trees and rivers. But Arcadia is depopulating rapidly today. This book stems from our concern about Arcadia and its inhabitants; it derives from our commitment to revitalize the area and from our hope that it is feasible.

This book would not be possible without the Publisher who cordially embraced the book idea, the reviewers, and the contributing authors. Special 'thank you' is extended to the Editorial Assistant, Ms Anna Scaife, and the entire Emerald Publishing team.

We dedicate this book to Arcadia and the memories it brings,  
The Editors: Anna Visvizi, Miltiadis D. Lytras, and György Mudri

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# Foreword

## Smart Villages Approach for a Brighter Future of Rural Communities in the European Union

The European Union (EU) is an exemplary smart model, constantly investing in innovation and development. Along with this smart model and beyond the pure economic advantages, the quality of life of people has always been the key force behind the EU policymaking. However, the impact of these efforts has been different in urban and rural areas. Therefore, today, there is a clear need for a new integrated, innovative approach to rural areas in the EU. This approach can be best termed as 'smart villages' approach.

The expansion of ICT-enhanced applications and services enable societies to improve their opportunities and improve their attractiveness and the quality of life not only in urban but in rural areas as well. We see many twenty-first century innovations in our constituencies; innovations, that are usually a little bit more and a little bit quicker in urban areas. People dealing with rural areas sense it for a while, even before the concrete actions appeared in the form of the smart villages concept.

Of course, one may wonder: what exactly does 'smart' mean for us as politicians in the smart villages concept? Is it life, water, energy, community, or food? Is it the technology, the ways and means, or the status? What do villages, or rural areas in the concept actually stand for?

Our first answer is that there are different smart elements, which definitely share some common layers. Their meaning, however, may differ in different parts of our globe. But being smart definitely is about intelligent applications, the various interactions of the existing and new technologies, and also the efficient use of big data analysis adjustments. The concept of smart villages does not propose a one-size-fits-all solution. It is territorially sensitive, based on the needs and potential of a given territory, and strategy-led, supported by new or existing territorial strategies. In addition, when talking about European villages, and rural areas, we do not solely mean the 22 million EU farmers, or people working directly in the agricultural sector. More than half of the EU's land area is within regions classified as predominantly rural. More than 112 million people inhabit these areas. We are happy to welcome and commend many EU objectives under different funds and policies, such as the Common Agricultural Policy, related to innovation, digitalization, transformation, and modern rural life in the EU.

At the same time, we can extend the approach to become global, as rural areas face specific challenges that need specific solutions everywhere. Aging populations, lack of services (medical, postal, health, transport, and energy), and limited broadband must all be addressed. Ensuring digital access can help sustain a healthy agriculture sector that in turn can help rural areas stem

themselves against depopulation, and help them retain young people. The concept sets out to create liveable villages, where people can and want to settle, because innovative, interconnected digital solutions improve their lifestyles. New business models, and platforms based on shared economy, currently concentrated in urban areas, are the best examples. However, this is just the beginning. The authors of this book described various technologies for completing this particular smart project, reflecting the many layers involved. We are hopeful that this approach helps you to grasp the complexity of this concept.

The smart villages concept has been proposed and successfully launched to a niche for the sake of rural areas, not only in the EU but also in the global arena as well. We had various discussions and consultations with different stakeholders including laymen and highly specialized academics and rural development practitioners. It has been pushed forward by our common efforts, by our persistent fight for the smart villages concept. We have been actively promoting this concept via a pilot project and preparatory actions since 2015. Indeed, we believe that smart villages offer the best way forward for a sustainable realization of the vision outlined in the Cork Declaration, while rural areas face a real and complex challenge. A challenge that needs to be tackled by a smart approach needs to pay exact attention to mitigate the digital divide between rural and urban areas and to develop the potential offered by connectivity and digitization of rural areas. Besides that, the need for integrated approaches and the complementarity and coherence interaction between different policy fields already emerged in this declaration. Throughout our common work, involving many publications, and the motivation of even more articles, we have always enjoyed inspiration from academics, from practitioners, and from a wide array of different stakeholders.

As generally perceived – and as we see it – this should be the role of Members of the European Parliament: representing the interest of the people, listening to their needs, translating, and further elaborating these needs with the help of the academics and practitioners. This assures that, at the end of the day, these new tools find their manifestation in (European) legislation. As politicians, we need to identify the needs that are important for future development. We must also acknowledge that many innovations here in Brussels are the results of input and feedback from our constituencies. Brussels has the potential to become a ‘European Silicon Valley’ not only at the legislative level. Read this book and you will become more familiar also with the process of idea-to-legislation practices.

Revitalizing rural communities and making them more attractive and sustainable is possible by using the full potential of information and communication technology. We believe that offering business opportunities, making rural areas more attractive for investors, and enabling farmers and other local actors to use their potential are the key to build successful rural communities. But the story cannot stop here; it is visible that more work needs to be done on this field and hopefully we will all have the opportunity to continue this useful and expected complex development approach.

We are personally satisfied, as over the past five years, our efforts as Members of the European Parliament were focused on building consensus around the necessity of rural areas and rural communities. We are grateful for the support we have received from several EU Commissioners in office, as well as from their Directorate-Generals, with our special thanks being extended to Mr Phil Hogan, Commissioner for Agriculture and Rural Development, and to the colleagues from DG AGRI.

We are equally grateful to all the outstanding authors of this book for their time and dedication, and especially to Dr Anna Visvizi, Dr Miltiadis D. Lytras and Mr György Mudri, the book Editors, for being the engines of this project!

Please read this excellent book, and join us in the effort to make rural areas truly successful again!

*Tibor Szanyi and Franc Bogovic  
Members of the European Parliament  
Initiators of the Smart Villages' Projects in the European Parliament*

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## Chapter 1

# Smart Villages: Relevance, Approaches, Policymaking Implications

*Anna Visvizi, Miltiadis D. Lytras and György Mudri*

### Introduction

Smart village may be a new, and for that matter a rather fancy, concept, yet the thrust of problems and challenges that it speaks to is by no means trivial or new. Therefore, the imperative inherent in the smart village concept and debate is to diagnose the status quo, propose viable ways of addressing problems and challenges, build consensus about the need to take action, and to actually follow the suit at micro-, mezzo-, and macro-levels. The truth is that villages – and so the romanticized picture of pastoral life and the beauty of nature, so close to childhood memories of many who will read the book – are under threat of disappearing. Several factors contribute to that. Perhaps the most important of them are progressing pace of urbanization coupled with the perceived opportunities that city life bears and negative demographic tendencies in rural areas. The problem is acute across the European Union (EU), but certainly, and regrettably so, it exists elsewhere too. As the process of depopulation of rural areas progresses, so is the heritage inherent in villages vanishing. At the same time risks, threats, and new challenges arise.

### Rethinking the Rationale behind Smart Villages: Typology of Risks, Threats, and Challenges

As elaborated elsewhere (Visvizi & Lytras, 2018a), depopulating villages tend to be inhabited by the elderly, usually single, in need of medical care, help with cooking, and [...] just 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. Risks to their safety include the risk of not only burglary, assault, fire, and flooding but also malnourishment and sickness. Depopulating villages frequently lack basic

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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, including 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 needs to begin today – action needed today	
(3) Long-term	Very important	Question of cultural heritage, governability, and the cost of inaction	Planning needs to begin today – action needed in the near future	

Source: Visvizi and Lytras (2018a).

infrastructure, such as roads, reliable electricity grids, but also doctors, schools, and affordable groceries. This affects the wellbeing and quality of life in villages for its current inhabitants, both young and elderly. It also creates disincentives for possible newcomers and incentives for current inhabitants to leave. Depopulating villages frequently embody artifacts of inimitable cultural heritage, in terms of architecture, tradition (rites, habits), and oral history. Today's elderly are the guardians of traditions and heritage, but who will carry our shared tradition when its today's guardians are gone? There is also the big question of long-term implications of increasingly depopulated villages and rural areas, that is, the question of the state's administration ability to exert its control over those areas. These are real problems that require responses. Table 1 offers a snapshot view of these problems and challenges, while at the same time hinting to the urgency of action that needs to be taken to address them.

## Smart Villages: The Concept and Its Relevance

The concept of smart village made its inroad into the policymaking and academic debates nearly simultaneously. On the policymaking front, the European Commission has been the champion of 'smart villages,' as reflected in Cork 2.0 Declaration of 2016 (European Union, 2016). The European Parliament upheld the momentum and so the Bled Declaration of 2018 adds further content to the

idea and resultant policy strategies. Certainly, the concept and the idea have been borne out of several decades of debates and policymaking pertaining to mostly Common Agricultural Policy (CAP), Regional Policy, and then Cohesion Policy. In this context, the first Cork Declaration of 1996 (ECRD, 1996) should be pointed out. Today, the concept of smart village has been defined by the European Commission as follows:

“Smart Villages are rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities,” where “traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge” (ENRD, 2018; European Commission, 2016)

With regard to the academic debate on smart villages, the rise of interest in the concept, its application, and implications can be related to the maturing of the debate on smart cities (Visvizi & Lytras, 2018a; Visvizi, Mazzucelli, & Lytras, 2017). It can also be related to the individual discovery process, that is, field research, personal experiences, and the resulting commitment to the cause of specific researchers. Research interest triggered by the sad examples of depopulating Greek villages in Peloponnese, especially in what used to be mythical Arcadia, or the equally tragically compelling example of Epirus, proves the point.

This volume brings these two rationales underpinning ‘smart villages’ together, thus making a case for a conceptually sound, academically disciplined, empirically driven discussion on smart villages and its relevance and application in the policymaking process. Indeed, the contributing authors represent both academia and the world of policymaking, thus confirming that dialog between these two is feasible and that synergies thus created can effectively feed the policymaking process.

The thrust of the concept of smart village that this volume advances is therefore delineated by three issues (see Figure 1 for details). First, the focus is the village seen as an ecosystem, a microcosm, a community, and people, rather than an aggregate, largely de-personalized construct such a ‘rural area’ or ‘country-side.’ Second, the value added by modern sophisticated information and communication technology (ICT) that can be applied in the context of a village is emphasized. Considering the two points aforementioned, by ontologically reifying the village, the focus of analysis in smart village research, as outlined in this volume, shifts to inhabitants of a given village, be it plural or individual (Visvizi & Lytras, 2018a). At the same time, a considerate and ethically and socially conscious use of ICT is advocated (Lytras & Visvizi, 2018; Visvizi et al., 2017). Notably, by focusing on specific needs and challenges individuals face, and by highlighting the value added by ICT, the so-defined debate on smart villages inadvertently engages itself with diagnosis of problems at hand and prescription of what needs to be done (Visvizi & Lytras, 2018b). This serves as a

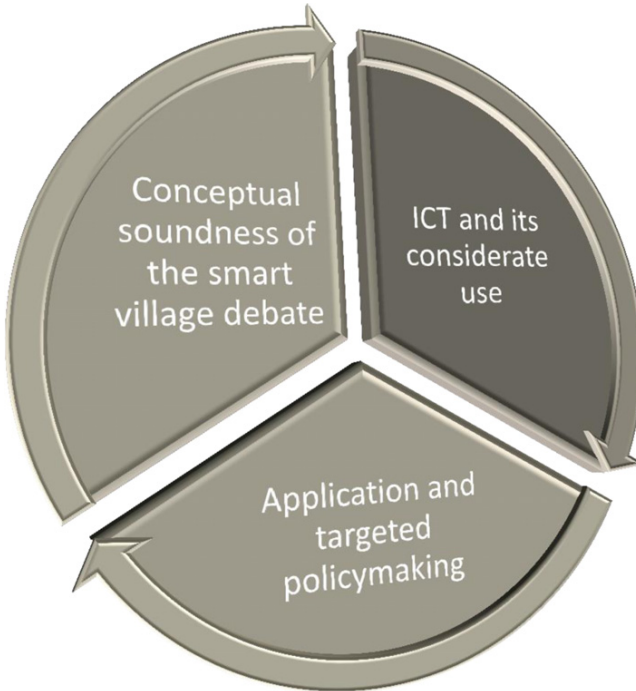


Figure 1. Smart Village: The Three Pillars of the Comprehensive Approach to Smart Village. *Source:* The authors.

bridge to the third segment of the approach that this book advances, that is, application and targeted, effective policymaking. Seen in this way, the approach to smart village that this volume promotes is comprehensive. That is, it brings together the specific to the academia conceptual zeal, highlights the value added by ICT, and engages in dialog with policymakers (Figure 1).

### **Smart Villages: The Imperative The Concept Entails**

The imperative the concept and the debate on smart villages entail, to put it bluntly, is to save villages, their inhabitants, the heritage, the potential, as well as to preempt nascent risks. The challenge inherent in pursuit of this imperative is that the key stakeholders only rarely engage in a meaningful, constructive, and unbiased dialog. As Figure 2 outlines, comprehensive approach to smart villages, an approach that translates in targeted and effective policymaking, requires that all stakeholders are involved. This means that: village inhabitants are listened to and encouraged to execute their agency; the academia relates to the real problems and challenges and offers conceptually sound and methodologically disciplined frame in which these problems and challenges can be contextualized; that the think-tank sector recognizes the need to draw from

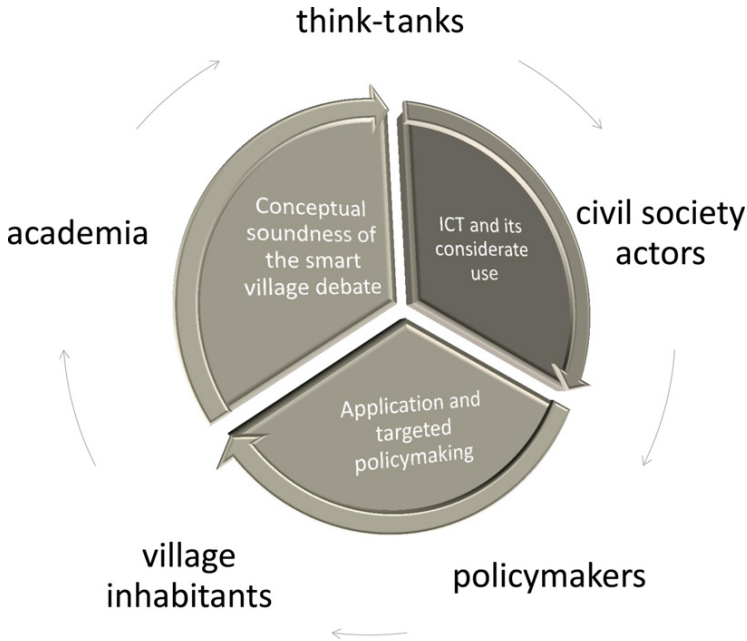


Figure 2. Smart Villages: From Needs to Targeted and Effective Policymaking. *Source:* The authors.

academic research and engages in dialog; the civil society actors are listened to carefully; and finally, a two-way bridge exists that links these actors with policymakers.

This volume proves that dialog engaging village inhabitants, the academia, the think-tank sector, civil society, and policymakers is possible. Representing the finest universities, think-tanks, advocacy groups, and the EU institutions, the authors contributing to this volume address diverse aspects of the debate on smart villages. As a result, from the policymaking point of view, this book offers not only a compelling insight into the key issues and challenges that the debate on smart villages revolves around but also a set of recommendations as to what can be done and what actions are already underway. From an academic point of view, this book defines the emerging field of research on smart villages. Departing from the research on smart cities, cognizant of the limitations and caveats specific to the latter (Visvizi & Lytras, 2018b), the comprehensive approach to the concept of smart village, that this volume advocates (Figure 1), invites inter- and multidisciplinary research focused on real needs and challenges and committed to devising ways of navigating them. ICT is seen as one of the means of so doing. At the heart of the smart villages' concept advocated here is the human being, inhabitant of the village, and his/her wellbeing. The chapters included in this volume skilfully draw from this conceptual and, indeed, normative framework, and convey hope that villages across the EU can be saved after all.

## About This Volume and the Message It Conveys

This volume consists of 12 chapters addressing diverse issues related to the debate on smart villages. It offers a thorough insight into the concept of smart village, its application, and implications (Chapters 1, 2, and 3). The book is also filled with content drawing from developments in the field, including policymaking actions and strategies (Chapters 4, 5, and 6), issue and policy areas (Chapters 7, 8, and 9), and country case studies. Even if the focus of the volume is directed at the EU and the question of smart villages in the EU, a case is made that similar problems and challenges exist elsewhere. Chapters 10 and 11 elaborating on the cases of South Korea and the Gulf Cooperation Council (GCC) countries attest to that. Chapter 12 sheds light on the new research agenda and policymaking strategies that the smart village concept and debate necessitate.

In Chapter 2, titled ‘Integrated Approach to Sustainable EU Smart Villages Policies,’ Christiane Kirketerp de Viron and György Mudri elaborate on the origin of the smart village concept in the EU-level debate. As the authors explain, the concept of smart village emerged in EU-level policy debates on rural development in 2016, following the stakeholder-driven Cork 2.0 Declaration. It was developed through a pilot project initiative on ‘Smart, Eco, Social Villages’ and spelled out in the ‘EU Action for Smart Villages’ initiative. While the concept of smart villages remains unclear for many, substantial work has been carried out to develop the concept and to prepare the underlying supporting instruments at EU level over the last three years. The aim of this chapter is to give an overview of how the concept of smart villages has evolved at the EU level and to draw some recommendations for future policy work. The chapter reveals difficulties of the utilization efficiency of the EU funds in rural areas and shows a patched landscape of fragmented policy instruments. The key arguments are that while the mixture of these tools is important, the glue that binds them together is still missing and that the general utilization efficiency is not sufficient. The authors offer a set of five recommendations for the short to medium term, which is needed for the successful implementation of the smart approach: integration, simplification, communication, innovation, and ‘rural proofing.’

In Chapter 3, titled ‘Smart Villages Revisited: Conceptual Background and New Challenges at the Local Level,’ Oskar Wolski and Marcin Wójcik argue that the smart villages’ approach to rural development is promoted by the EU factors in the diversity of rural areas and the different nature of challenges faced by each area. The central role is assigned to local communities – formation of appropriate characteristics and attitudes that enable the creation of optimal conditions for development. This is also the result of the evolution of rural development policy, which is driven by the dynamics and direction of change of rural areas and changes in societal perception of change events in rural areas. The implementation of this development approach at the local level requires a transformation of the current school of thinking on development and the utilization of available resources. The key role in this process is played by local governments, which are part of the local community and also represent its interests.

The chapter combines theoretical and practical issues and represents a geographic perspective. Its first aim is to answer the question: How can local governments create the right conditions for smart development at the local level? The second aim is to discuss the smart village approach in the context of selected development concepts. This leads to a number of specific recommendations for policymakers. It also helps them to understand the approach, which is vital in the implementation of the aforesaid recommendations.

In Chapter 4, titled ‘Toward a New Sustainable Development Model for Smart Villages,’ Raquel Pérez-delHoyo and Higinio Mora explore the question of resilience in rural areas. As the authors explain, rural communities are increasingly open to a globalized world, and migration from rural areas to cities is becoming increasingly important. Many rural areas face depopulation, an aging population, and limited access to a range of services. To address this challenge, the ICT involved in the concept of smart villages have much to offer. In order to streamline the debate, this chapter proposes a methodology based on resilience. Resilience is defined as the ability of a habitat or system to recover to its initial state when the disturbance to which it has been subjected has ceased. In this regard, a retrospective of rural areas is proposed based on the experience of the garden city model, for which the advantages of rural areas were evident over those of urban areas. The objective is to reconsider the intrinsic qualities of rural areas in order to recover and enhance them with the added value of the EU Smart Villages approach. These facets will be the driving forces behind sustainable development. In conclusion, a number of recommendations are presented, including the development of a catalog, structured by regions and territories, of rural areas and their different potentials and opportunities, for the development of smart village projects.

In Chapter 5, titled ‘The Role of LEADER in Smart Villages: An Opportunity to Reconnect with Rural Communities,’ Enrique Nieto and Pedro Brosei focus on the program LEADER (Liaison Entre Actions de Développement de l’Économie Rurale), i.e., ‘Links between the rural economy and development actions’), its evolution, and its value addition in the context of the debate on smart villages. The authors argue that over recent decades, rural areas have been facing significant challenges that exacerbate the existing discontent in their communities. These challenges are mostly reflected in depopulation trends, increased vulnerability to external shocks, and reduced quality of basic services. Local Action Groups (LAGs) all over Europe have been working on these challenges since the early 1990s. More recently, the smart villages concept is starting to generate enthusiasm among rural development stakeholders to try to revert these trends by supporting communities to move toward a more sustainable future while taking advantage of new, emerging opportunities. This chapter demonstrates that the LEADER approach and its principles are also part of the smart villages concept. However, practical differences between the two emerge as a result of limitations imposed by restrictive LEADER regulatory frameworks in many member states. Our main argument is that LEADER has what is needed to be the main tool for driving smart villages in Europe as long as there is a policy framework in place that enables LEADER to exploit its full

potential. This conclusion is grounded on the analysis of the role that LEADER played in a number of smart villages initiatives across the EU.

In Chapter 6, Daniel Azevedo makes a powerful case for precision agriculture and its relevance for villages and their sustainability. As the author explains, stakeholders all over the EU, including academics, local and national authorities, business representatives, civil society, and the EU institutions are interested in creating a better life for citizens inhabiting rural areas. Building up on previous successful policies, including for instance the CAP and political actions, such as those outlined in the Cork 2.0 Declaration, these stakeholders assessed the current and future challenges of EU rural areas. The EU agri-food sector is not only the backbone of the EU rural areas but is also a driver of the EU economy, that is, delivering 44 million jobs in the EU and representing 3.7% of EU's gross domestic product (GDP). The EU is thus the world's number one exporter of agricultural and food products amounting to €138 billion in 2017. Today, the technological progress and the digital economy are transforming the EU economy in a way and speed never seen before; agriculture and food production are no exceptions. Obviously, the agriculture and the food production activities may have less obvious significance to the smart city but are key in the smart village concept. The ongoing technological transformation of agriculture will certainly enable and influence the design and implementation of any concept for smart villages. The question is therefore complex: How can agriculture and food production contribute and influence the smart villages concept and related policy strategies? This chapter dwells on this issue.

In Chapter 7, titled 'Energy Diversification and Self-sustainable Smart Villages,' James K. R. Watson explores the growth and opportunities of small-scale local power generation and the implications for internet access for rural communities. Solar power has grown exponentially in the last decade across the world and has provided opportunities for the development of local energy communities and on microgrids across the world and in Europe. The huge cost reductions experienced in generating solar power and its relative mobile and flexible nature have made it a technology perfect for rural areas to develop their own sustainable source of electricity supply. The increasing rise of digital tools has coupled nicely with the advent of the mass use of solar power in rural areas and thus the connection between smart solar and smart villages has become increasingly a norm. Rural communities in Europe have embraced solar technology, with many farmers using solar power as a means to reduce their electricity costs and also generate new streams of income to improve their overall livelihoods. Some case studies from India, Germany, and Africa will be examined. Other experiences will also be considered, especially where double land use between solar power and livestock has empowered rural communities. Outside of Europe, Africa and Asia have also seen solar power as a means to electrify remote rural villages. This has led to the development of microgrids and new technologies that are less deployed in Europe, which are being rolled out for rural communities in the rest of the world. This has been particularly successful in creating smart rural communities, as often digital communications have already reached these communities and thus power and telecoms are combining