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Digitalization and Civic Participation in Rural Areas. A Systematic Review of Scientific Journals, 2010-2020

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Abstract

The smart village is digitally networked and participatory. Its “smartness”, in other words, should be based on interaction between technological infrastructures and civic engagement. While this vision has inspired European policymaking and public discourse in recent years, understanding of the interaction between digitalization and civic participation in rural areas remains limited. In order to fill this gap, this paper offers a systematic review of journal contributions situated at the intersection of digitalization, participatory efforts and rural development. Overall, our study shows that digital rural development and its interplay with participation processes is still a niche concern in scientific journals. We find that articles focus primarily on projects seeking to increase broadband capacity. Second, they focus on the spatial characteristics of rural areas, where social relations and intermediaries play an

important role. Third, they emphasize the integration of top-down measures with bottom-up initiatives. There is no single, dominant theoretical approach conceptualizing the intertwining of digitalization and civic participation processes in rural areas. It is evident that local social networks are strengthened and maintained through both analogue and digital formats. Furthermore, the literature provides evidence that sustainable forms of digital engagement are based on civil society initiatives that are supported and accompanied by administrative measures.

Keywords: Participation ■ Civil Society ■ Digitalization ■ Rural Areas ■ Literature Review

Digitalisierung und Beteiligung in ländlichen Räumen. Eine systematische Literaturschau wissenschaftlicher Zeitschriften, 2010-2020

Zusammenfassung

Das *smart village* ist digital vernetzt und partizipativ. Seine angenommene *smartness* soll also auf der Verschränkung von technologischen Infrastrukturen und der Beteiligung der lokalen Bevölkerung beruhen. Doch obschon diese Vision in den letzten Jahren die europäische Politikgestaltung wie den öffentlichen Diskurs beflügelt hat, ist das Verständnis der Wechselwirkungen zwischen Digitalisierung und Partizipation in ländlichen Räumen noch begrenzt. Um diese Lücke zu schließen, stellt dieser Beitrag eine systematische Literaturschau zur Digitalisierung im Zusammenspiel mit Partizipation in ländlichen Räumen vor. Insgesamt wird dabei deutlich, dass die digitale Entwicklung im ländlichen Raum immer noch ein Nischenthema in wissenschaftlichen Zeitschriften ist. Ein zentraler Fokus lag in den einbezogenen Studien auf Projekten des Breitbandausbaus. Darüber hinaus wurden häufig die räumlich bedingten Merkmale ländlicher Gebiete diskutiert, in denen soziale Beziehungsgefüge und Intermediäre eine

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wichtige Rolle spielen. Schließlich wurde die Verschränkung von *top-down*-Maßnahmen mit *bottom-up*-Initiativen betont. Es fand sich kein dominanter theoretischer Ansatz, um das Ineinander von Digitalisierungs- und Partizipationsprozessen in ländlichen Räumen zu konzeptualisieren. Die Synopse unterstreicht die Wichtigkeit lokaler sozialer Netzwerke, die mittels analoger und digitaler Formate aufrechterhalten werden. Darüber hinaus liefert die Literatur Hinweise darauf, dass nachhaltige Formen digitalen Engagements auf zivilgesellschaftlichen Initiativen beruhen, die durch administrative Maßnahmen unterstützt und begleitet werden.

Schlüsselwörter: Beteiligung ■ Zivilgesellschaft ■ Digitalisierung ■ Ländliche Räume ■ Literaturschau

1 Introduction

The implementation of digitally networked services and devices was welcomed as a powerful catalyst for social progress. Plans for human-centred development, increased sustainability, educational reform and the advance of specific industrial sectors rest on the technological premises of digitalization. These developments have always involved a spatial dimension, usually epitomized by the smart city and focused on the increased efficiency of municipal operations (Hollands 2008; Bibri/Krogstie 2017; Vinod Kumar 2017). This focus on urban areas marginalizes rural areas: while the smart city is the object of numerous critical inquiries, the smart village has received less attention (Bock 2016; Visvizi/Lytras 2018; Meijers/van der Wouw 2019). In fact, discussion of digital development in rural areas is often framed in disparaging terms of rural backwardness (Christmann 2016: 365).

Scoping existing research on digital rural development that goes beyond such discourse, Saleminck, Strijker and Bosworth (2017a) distinguish two broad strands of inquiry. They found that one set of articles revolves around questions of connectivity and is thus engaged with the challenges of infrastructure provision and quality. The second collection of articles focuses on issues of inclusion that refer to uneven information and communication technology (ICT) diffusion, usage and skills. Due to a lack of connectivity and hampered diffusion, Saleminck, Strijker and Bosworth (2017a) argue, rural areas face the predicament of having little high-speed telecommunication access that could compensate for physical remoteness, which hence holds them back even more. Their overview starts with texts published in 1991 and ends in 2013; it is updated by Esteban-Navarro, García-Madurga, Morte-Nadal et al. (2020) who consider the academic literature on rural digital development between 2016 and 2020. Their recommendations are geared toward improving access

and connectivity as well as utilisation matters, for instance, by way of broadband investments, tailored government actions and education.

While these reviews capture both the technological supply-side and the demand-side of usage and skills, they fail to engage with the wider social dimension that undergirds digital development in rural areas. Besides being digitally networked, the smart village is also deemed to be participatory. Its “smartness”, in other words, should be based on the interrelation of technological infrastructures *and* civic engagement. While this vision has inspired European policy-making and public discourse in recent years, understanding of the interaction between digitalization and civic participation in rural areas remains limited and there is no concise overview of scientific knowledge on these matters.

In order to address this lacuna, we offer a systematic review of scientific work positioned at the intersection of rurality, digitalization and participation. Looking at scientific articles, the synopsis charts their research interests and insights, conceptual orientation and methodical approaches. The review is guided by two focuses. We inquire into the issues associated with digitalization and participation in rural areas, and we examine which conceptual frameworks are used in publications on digitalization processes in rural areas and their interplay with participatory efforts. We proceed as follows. In the first step, we chart the existing debate around the role played by digitalization and participation, and their respective interaction, in rural areas and inform the notion of smart villages (Section 2). Next, we introduce the methods and data of our review that surveys articles from refereed journals published between 2010 and 2020 (Section 3) before presenting (Section 4) and discussing (Section 5) the insights we gained from our overview.

2 Background: Digitalization and Participation in Rural Areas

2.1 The smart village concept

Within the European Union, the notion of the smart village was raised as early as 2010. As an ambitious concept in policymaking, it gained traction in 2017 with the “Action for Smart Villages Plan”, which in turn paved the way for the European Network for Rural Development (ENRD 2018a, b). The smart village is characterized as being digitally networked and participatory (European Commission 2020: 52–54). Its “smartness”, in other words, rests on the interconnection of technological infrastructures and civic engagement, although the relation between these two remains vague (Slee 2019). At the same time, the notion highlights a shift toward participatory approaches in rural devel-

opment: it foregrounds good governance as well as forms of decentralization and democratic deliberation. Opening up regional digital development to civic participation is deemed essential if one wishes to legitimate and empower local actors who share in defining the living and working conditions in their region (Matern/Binder/Noack 2020). Note that speaking about regions does not necessarily implicate rurality since regions can in fact span across urban and rural spaces. However, in the European policy discourse around “smart regions”, the term is often used to distinguish rural areas from cities and urban zones (Lyshchikova/Stryabkova/Glotova et al. 2019: 1340–1341). In line with the “Cork 2.0 Declaration” (ENRD 2016), we prefer to speak of “rural areas” and “area-specific development” instead.

Note too that participation can mean different things here. According to Arnstein’s (1969: 217) classical model of the ladder of participation, citizens may assume different levels of agency, control and power in steering political decisions. Thus, to speak of participation in fact refers to a range from direct control to the mere illusion of being given power. Such a typology of increasing participatory power – with a particular focus on political decision-making, the formulation of policies and planning – has been affirmed by Pretty (1995: 1252) whose concept ranges from passive and counterfeit forms of non-participation to interactive kinds of citizen-led government. In addition, especially in the context of rural development, Cohen and Uphoff (1980: 219–221) have proposed a project cycle which sees people participating in every stage of rural development programs, going from planning to execution and evaluation.

Considering the consequences of digitalization for reconfiguring such participatory processes, high-speed broadband coverage is commonly treated as a prerequisite. This renders rural areas, that fall notoriously short of high-capacity telecommunication networks, problematic (Townsend/Wallace/Fairhurst 2015; Pant/Hambly Odame 2017; Hambly/Rajabiun 2021). Further studies and white papers which draw attention to digitalization endeavours in rural areas map the status quo of technological and administrative procedures and provide an inventory of use cases. As part of this, they also show how digital solutions have been adopted in different geographical areas and within diverse fields of application (ENRD 2018a, b). Usually, they draw on single case studies (Franke/Magel 2018).¹ As charted by Visvizi, Lytras and Mudri (2019: 2–5), smart villages can use infor-

mation and communication technologies to cope with short-term emergencies involving safety and security issues. Information and communication technologies can be employed to address mid-term challenges to well-being and quality of life, and they may be of use in long-term projects around cultural heritage or government actions. This covers a range of public services and Visvizi, Lytras and Mudri (2019) predict a fundamental shift toward treating information and communication technologies as agents of change in all areas of life. Yet while the transformative power of information and communication technologies appears to be widely accepted, the extent and direction of their effect is ambivalent.

2.2 The two sides of digitalization

To date, assessments of digitalization in rural areas and in particular its interplay with participatory efforts remain ambivalent with some highlighting its positive effects and others noting its negative outcomes. Among one camp of scholars, the idea prevails that digitalization can have benign consequences if it is managed well. For example, local service provision and inclusion in telemedicine can close gaps in the healthcare system and may counter the lack of personal care (Bürgin/Mayer 2020: 83). Further, digitalization can serve to strengthen local supply offerings and new business models (Ievoli/Belliggiano/Marandola et al. 2019). Likewise, some argue that digital neighbourhoods can build up social support, which in turn might have a positive impact on civic participation (Meyn 2020: 106–108). From a public sector perspective, information and communication technologies can bridge geographical distance if they are used to promote networked administrative instruments for e-governance or e-participation (Lan/Peng 2018).

Digital technologies and tools, which can include, for example, open data, forums for discussion and idea generation or specially designed apps, can open up consultation processes and increase participation not only by bridging geographical distance but by activating a broader spectrum of social groups. Civil society initiatives can also use such digital instruments to initiate new projects or become involved in ongoing local development processes. In that respect, some observers expect digitalization to enable novel kinds of deliberation and to improve the intensity as well as the quality of political participation (Naldi/Nilsson/Westlund et al. 2015; Kaczorowski/Swarat 2018).

In turn, a more pessimistic perspective suggests that these developments could add to existing inequities or open up new ones (e.g., Hindman 2000). It is a pessimistic perspective since it rejects the optimism of a belief in any straightforward way to overcome supply-side shortcomings and demand-side incapacities. Indeed, it stresses the fundamental challenges that accrue from, among other things, the

¹ see also the contributions in the special issue “Smart European Village” of the journal “European Countryside”: <https://sciendo.com/issue/euco/11/4> (03.01.2022).

costs of implementing digital solutions, the skills that are necessary to engage with them, and the need for intersectoral cooperation (e.g., Komorowski/Stanny 2020). Structural disparities exacerbate such problems. They stem from geographical remoteness, insufficient logistical networks, disadvantageous economic transitions and unemployment, declining population size and the out-migration of young people (Commins 2004; Bock 2016: 556). These impediments are often accompanied by scepticism or even the rejection of digital tools by some parts of the rural population. This underscores the often-described interconnection between unequal digital participation, spatial disparity and social inequalities (Komorowski/Stanny 2020).

Against the background of such ambivalent expectations, our literature review is guided by the question: What issues are associated with digitalization and participation in rural areas (RQ1)? Different views on the advantages and disadvantages of digitalization for participatory efforts in rural areas are arguably based on different conceptual commitments that emphasize either positive effects or negative outcomes. For that reason, we also ask: Which conceptual frameworks are used in publications on digitalization processes in rural areas and their interplay with participatory efforts (RQ2)?

3 Data and Method: Systematic Literature Review

The systematic literature review seeks to draw together current research on digitalization in rural areas and its connection to participation processes. This intersection encompasses several topics, namely digitalization, participation and spatial categories such as rural area and region.

Due to the fragmentary nature of knowledge on rural participation and digitalization, we employed a systematic review procedure of the kind advanced by Salemink, Strijker and Bosworth (2017a), as well as Esteban-Navarro, García-Madurga, Morte-Nadal et al. (2020). We used this to compile the scattered evidence and map key findings and common tendencies. We surveyed the disparate, interdisciplinary literature on this topic in order to cover the different insights and research approaches that can provide a basis for more conceptualization and empirical work. Refereed scientific journals are particularly suitable for tracking the current state of the art both within a field and across academic disciplines. As periodicals, they are the “nerves of a discipline” (Weaver/Wilhoit 1988: 32) that register scholarly trends and emerging interests. Often, they set research themes and provide prime venues for publishing the most competitive work. Furthermore, they rely on peer review to

scrutinize and verify the proposed findings and arguments before they go to print.

3.1 Data collection

We collected English-language articles published between 2010 and 2020 based on a list of SSCI-listed journals in the Web of Science database, focusing specifically on journals included in the following six broad, multi-disciplinary clusters: social sciences, regional and urban planning, sociology, geography, communication and political science. The timeframe was chosen to capture the ramifications of three recent generations of information and communication technology, i.e., the diffusion of wireless technologies and smartphones, the rise of platforms and application-based services, and the advent of smart technologies and Internet of Things devices (Cowie/Townsend/Salemink 2020). We opted for English-language articles since English constitutes the academic *lingua franca* and allows an exchange of research findings from different localities and academic systems. The sampling yielded a register of more than 250 journals.²

We formulated keywords based on the paramount topics of digitalization, participation and rurality. The initial heuristic set of keywords was generated from preliminary theoretical considerations, research overviews and policy papers. We subsequently tested and expanded the initial list of keywords in order to avoid overlooking publications that address the topic using different terminology. The final list includes the following search terms: for the digital component, “information technology”, “communication technology”, “digital”; for participation aspects, “participation” and “policy”; for spatial categories with a focus on rurality, “rural development”, “regional development”, “rural areas”, “remote areas” and “countryside”. These terminologies proved to be the most useful to muster a comprehensive sample. We tested for possible other terms like “periphery”, “rural region” or “remote region” but they did not generate distinct results otherwise not captured by our set of keywords and were thus left out. The final set of search terms parallels the rural components used by Salemink, Strijker and Bosworth (2017a: 363).

For the search, we used truncation/wildcards (*) in order to account for differences in spelling (usually replaces any number of characters), e.g., digital* for digitalization or digitalisation. We used placeholders that stand for another let-

² The full list of journals and a detailed overview of the sampling and analysis can be accessed here: https://www.uni-leipzig.de/fileadmin/Fakult%C3%A4t_SozPhil/Institut_KMW/Medien-_und_Kommunikationswissenschaft/journal_list_rur.txt (04.02.2022).

Table 1 List of journal articles yielded by the keyword-driven search covering the topics of digitalization, participation and spatial categories

Author(s)	Year	Journal	Title
Nuur, C.; Laestadius, S.	2010	European Urban and Regional Studies	Development in peripheral regions: Case studies in Sweden
Mack, E.A.	2014	Papers in Regional Science	Broadband and knowledge intensive firm clusters: Essential link or auxiliary connection?
Reggi, L.; Arduini, D.; Biagetti, M.; Zanfei, A.	2014	Telecommunications Policy	How advanced are Italian regions in terms of public e-services? The construction of a composite indicator to analyze patterns of innovation diffusion in the public sector
Schulte, B.	2015	Chinese Journal of Communication	(Dis)Empowering technologies: ICT for education (ICT4E) in China, past and present
Townsend, L.; Wallace, C.; Fairhurst, G.	2015	Scottish Geographical Journal	'Stuck Out Here': The Critical Role of Broadband for Remote Rural Places
Correa, T.; Pavez, I.	2016	Journal of Computer-Mediated Communication	Digital Inclusion in Rural Areas: A Qualitative Exploration of Challenges faced by People from Isolated Communities
Erdiaw-Kwasie, M.O.; Alam, K.	2016	Journal of Rural Studies	Towards understanding digital divide in rural partnerships and development: A framework and evidence from rural Australia
Barns, S.; Cosgrave, E.; Acuto, M.; McNeill, D.	2017	Urban Policy and Research	Digital Infrastructures and Urban Governance
Larty, J.; Jack, S.; Lockett, N.	2017	Regional Studies	Building Regions: A Resource-Based View of a Policy-Led Knowledge Exchange Network
Philip, L.; Cottrill, C.; Farrington, J.; Williams, F.; Ashmore, F.	2017	Journal of Rural Studies	The digital divide: Patterns, policy and scenarios for connecting the 'final few' in rural communities across Great Britain
Roberts, E.; Anderson, B.A.; Skerratt, S.; Farrington, J.	2017	Journal of Rural Studies	A review of the rural-digital policy agenda from a community resilience perspective
Salemink, K.; Strijker, D.; Bosworth, G.	2017a	Journal of Rural Studies	Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas
Salemink, K.; Strijker, D.; Bosworth, G.	2017b	Sociologia Ruralis	The Community Reclaims Control? Learning Experiences from Rural Broadband Initiatives in the Netherlands
Onitsuka, K.; Hoshino, S.	2018	Journal of Rural Studies	Inter-community networks of rural leaders and key people: Case study on a rural revitalization program in Kyoto Prefecture, Japan
Salemink, K.; Strijker, D.	2018	Telecommunications Policy	The participation society and its inability to correct the failure of market players to deliver adequate service levels in rural areas
Schmidt, S.; Müller, F.C.; Ibert, O.; Brinks, V.	2018	European Urban and Regional Studies	Open Region: Creating and exploiting opportunities for innovation at the regional scale
Magnusson, D.; Hermelin, B.	2019	Norsk Geografisk Tidsskrift – Norwegian Journal of Geography	ICT development from the perspective of connectivity and inclusion. The operation of a local digital agenda in Sweden
Rehfeld, D.; Terstriep, J.	2019	Innovation: The European Journal of Social Science Research	Regional governance in North Rhine-Westphalia – lessons for smart specialisation strategies?
Braesemann, F.; Lehdonvirta, V.; Kässi, O.	2020	Information, Communication and Society	ICTs and the urban-rural divide: can online labour platforms bridge the gap?
Hoque, R.	2020	Technology in Society	The impact of the ICT4D project on sustainable rural development using a capability approach: Evidence from Bangladesh
Lí, R.; Chen, K.; Wu, D.	2020	Annals of the American Association of Geographers	Challenges and Opportunities for Coping with the Smart Divide in Rural America
Van Aswegen, M.; Retief, F.P.	2020	Land Use Policy	The role of innovation and knowledge networks as a policy mechanism towards more resilient peripheral regions

ter, e.g., “rural area?” in order to include singular and plural forms. We placed search terms in quotation marks to ensure that they appear in exactly the given order because, for example, the term “area” is used not only in the phrase “rural area” but in many different contexts. We used the Boolean operators AND, respectively OR, with AND capturing the combination of topics, e.g., digital* AND participation (i.e., the main focus of our analysis), and with OR identifying relevant pieces via synonyms, e.g., “regional development” OR “rural development”. Such an approach is necessarily characterized by polysemy. Therefore, it has to cope with the problem that concepts such as innovation and smartness are highly context-specific and thus have to be considered with respect to spatial, infrastructural and sociopolitical circumstances (e.g., Matern/Binder/Noack 2020).

The search for keywords in article titles, given article keywords and keywords plus, as well as article abstracts, resulted in a total of 22 articles (see Table 1). The articles we found included the keywords and identified rural areas (or at least referred to them in contrast to the urban). Considering the wide scope of our search, the final corpus was quite meagre. To test for the suitability of our sampling horizon, we applied the same search terms for the period of 2000 to 2010. This did not yield a larger quantity of relevant pieces. Therefore, the low frequency appeared to be a constant feature and corroborates Salemin, Strijker and Bosworth (2017a: 362) who found about 4400 papers of which they discarded more than 95%. Likewise, Esteban-Navarro, García-Madurga, Morte-Nadal et al. (2020: 7–8) used a final sample of 28 papers, selected from 419 items initially collected.

We chose an approach that was open enough to cast a wide net while remaining sufficiently narrow to ensure that we chart aspects of digitalization and participation without incorporating incongruous articles. This, however, does not mean that our method was exhaustive. Following a stepwise and systematic procedure also meant that certain topical works were not included as they fell through the method’s net. We therefore included other relevant articles (e.g., Pant/Hambly Odame 2017) together with policy documents, monographs, edited volumes and the more widespread grey literature (reports from research agencies and administrative bodies) in the discussion to contextualize our findings in the ongoing debate. We employed such sources to connect the insights from our systematic review to the current discourse in policymaking, administrative practice and advocacy. It also allowed us to reflect on more recent developments not covered by the periodicals. Though all articles have been coded, for readability’s sake we follow Salemin, Strijker and Bosworth’s (2017a) decision to not take up every paper in the results and the discussion sections.

3.2 Coding

The articles were coded according to the following main categories: (1) area focus, (2) research topics or problems, (3) theories around participation, digitalization or spatiality, (4) research objectives, (5) applied methods, (6) results. The coding categories mirror both the focus on digitalization and participation in our research questions and the available conceptual methodologies on the role of digitalization approaches in rural areas and their interplay with participatory efforts. The first category captures the geographic focus of the article and the locations of its cases. The second category was devised in light of those passages that substantiate the focus of an article and the issues it seeks to tackle. The third category was meant to capture the conceptual background of the research under scrutiny. Whilst the second category resonated with RQ1, the third reflected RQ2. Both are linked to the fourth and the fifth categories that pertain to empirical papers’ methods and findings, which provide additional insights into the issues and conceptual assumptions of the research articles. We included area focus and the methodology of a study based on the assumption that a considerable portion would stem from case study research.

These aspects might surface in different sections of the articles, for instance in the formulation of the research topic or problem, the conceptual part, the definition of the research objectives, or the reporting and discussion of results. Due to the inherent fuzziness of the notions we were interested in and hence the absence of a clear topical structure, we did not try to operationalize these aspects into a fixed scheme. Instead, we opted for a more inductive coding procedure that enabled us to summarize, compare and systematize the relevant insights.

4 Results

As a whole, the articles we found are highly heterogeneous. They deal with different topics and cover diverse fields and are situated in a range of sectors including industry and creative work. The articles approach these sectors in terms of innovation, sustainability or connectivity. This diversity is reinforced by incongruent understandings of key terms such as “participation”. This term is invoked to refer to both political actions and equal opportunities for participation in public life, with the latter also including discussion of social inequality (e.g., Correa/Pavez 2016; Salemin/Strijker/Bosworth 2017b; Li/Chen/Wu 2020). Primarily, the articles are based on case studies with no clear geographical core area except a bias toward EU member states. In Europe, this includes Sweden and, on several occasions, the Nether-

lands as well as Germany, Italy and the former member U.K. Internationally, we found case studies from the United States, Chile, South Africa, Australia, Bangladesh, Japan and China. A small number of studies work comparatively, for instance by comparing Italian rural areas. Given this disparate orientation, the core aim in this article is to identify commonalities shared across at least some of the articles.

4.1 Cross-cutting issues

Three overarching issues around digitalization and participation could be established from the literature (RQ1): providing broadband connections, acknowledging area-specific peculiarities, and appreciating local networks and intermediaries.

A first thematic focus of general concern across the studies is the propagation of broadband connections and the political decision-making processes and forms of regulation they engender. The issue is taken up in six of the 22 articles. Overall, they underscore that information and communication technologies serve to support rural development and participation processes. This appraisal reiterates Chapman and Slaymaker (2002: 1) who already stated nearly 20 years ago that research and ICT initiatives “tend to focus on infrastructure development and the extension of information and communication technologies from the center to the periphery”. In light of this ill-advised preference, they admonished a more holistic view where broadband serves as an infrastructural requirement for rural development, but not its replacement. Thus, simply prioritizing broadband networks indeed fails to address the long-standing, area-specific challenges of rural development (Chapman/Slaymaker 2002: 2). In this way, they pointed to a misguided technological solutionism – an expectation shared by a substantial portion of the initiatives and government efforts examined by the articles in our sample. Most of them censure such wrongheaded “techno-optimism” (Schulte 2015: 60–63) or criticize the “technological bias” (Rehfeld/Terstriep 2019: 100) inherent in plans to digitalize rural areas and to create equitable living conditions beyond metropolitan environments.

On this note, there is a call for more local cooperation and recognition of the demands and contributions of citizens in building technological infrastructures for participation (Erđiaw-Kwasie/Alam 2016: 222; Roberts/Anderson/Skerratt et al. 2017: 382; Schmidt/Müller/Ibert et al. 2018: 199). The articles concentrate especially on bottom-up initiatives (i.e., projects arising from civic engagement) that seek to create or ensure telecommunication connectivity (Salemink/Strijker/Bosworth 2017b; Salemink/Strijker 2018). These activities raise a number of challenges. On the one hand, the work we found discusses conflict lines

between state authorities, economic interests and markets. On the other, these articles examine local interests that surface in debates on regulatory issues and autonomous organization. In addition, some papers also stress the limits of self-organized governance as well as the necessary financial and technological support from the administration which also includes ongoing engagement by government agencies. On a critical note, some contributions argue that in constellations where the improvement of digital infrastructure was strongly dependent on volunteers and local agents, a more sustainable provision of digital services could become problematic due to the limited resources of the participants. In these instances, studies caution against “volunteer burn out” (Salemink/Strijker/Bosworth 2017b: 568). In addition, they highlight the potentially more narrow technical capabilities of local administrations vis-à-vis telecommunication corporations. One article, for instance, refers to the relationship between the competences of local governments and the disproportionately greater power of technology firms (Erđiaw-Kwasie/Alam 2016: 221). Using an example from Germany, another study joins this line of criticism by arguing that innovation award competitions for rural development promoted by the government, which sometimes call for deepened cooperation with universities or consultancies, could indeed hinder user-oriented and demand-driven innovations (Rehfeld/Terstriep 2019: 100).

The second focus of the articles is the study of spatially defined peculiarities and the ensuing area-specific policy-making and planning. The issue comes up in six of the articles. They view the complex of local conditions and territorial relations as an inescapable prerequisite for the use and design of participatory projects by means of digital technologies. One study even speaks of a “geographical lottery” (Salemink/Strijker/Bosworth 2017b: 571). According to the articles in our sample, providing digital connectivity does not level out other disparities, for instance in terms of economic and innovation performance, population size, level of education, or the available educational, cultural and health facilities (e.g., Roberts/Anderson/Skerratt et al. 2017: 380–381). The capacities of local actors, these studies conclude, are determined by their geographical location. Of relevance in rural areas are a lower level of education relative to urban population, lower digital skills, a more dismissive attitude toward innovation, an emphasis on disadvantages, lower trust in technological solutions and a higher average age. It also became evident that digital offerings are interdependent and are often made available in bundles, not as separate instruments. For example, digital educational resources are open to citizens in areas with digital mobility services (Reggi/Arduini/Biagetti et al. 2014: 524–525). Relatedly, conditions associated with online labour are more likely to be located in cities (Brae-

semann/Lehdonvirta/Kässi 2020: 12). In addition to socio-cultural and political factors, historical conditions also play a role by opening up or closing down certain paths for development. Hence, there is widespread consensus that any of the available approaches to set up and integrate information and communication technologies must be adapted to local circumstances.

A third noticeable focus is on the importance of local social networks and intermediaries. Their role becomes particularly evident in grassroots movements and bottom-up projects. A total of four articles deals with this issue directly. The tenor of research is that social networks, which encompass different positions and role structures, are key to success and need to be supported. They can foment innovative collaborations by joining public funds and resources with private initiatives and their respective resources. Especially in rural areas, this form of collaboration is important because digitalization projects cannot be rolled out without support from personal, often informal, relationships and without incorporating knowledge of local circumstances. Therefore, when establishing digital innovations, from broadband supply to the e-services based on it, a major problem addressed in the publications was the participation of local actors, which was seen to be a key to better understand the characteristics of rural areas in innovation and adaptation processes. In effect, policies have to be tailored to the needs of rural populations. A number of articles advocate for the integration of top-down measures and bottom-up initiatives, an approach frequently associated with the moniker “neo-endogenous regional development” (Roberts/Anderson/Skerratt et al. 2017: 380; Salemink/Strijker/Bosworth 2017b; Salemink/Strijker 2018).

The need for collaboration, however, does not mean that actual joint endeavours run smoothly. For example, conflicts of interest might arise between local concerns, corporate interests and state planning (e.g., Nuur/Laestadius 2010: 303; Schmidt/Müller/Ibert et al. 2018: 192). Participation of a more diverse group of local stakeholders, also in the setup of technological tools, becomes an almost inevitable complication that needs to be addressed from the start. Overcoming such obstacles in a collective effort toward digitalization presupposes negotiation and the potential involvement of mediators and technological experts for external assessment and guidance. A lack of commitment or willingness to cooperate, in turn, precludes long-term ICT benefits. Moreover, an area’s potential for change and development is not only dependent on resources but also on resourceful local participants. According to the research, potential for change relies on actors who can act as catalysts for building digital capacities (e.g., Erdiaw-Kwasie/Alam 2016: 221).

4.2 Prevalent theoretical approaches

The articles do not share any recognizable theoretical basis on rural digital development in interaction with participatory efforts (RQ2). Instead, they exhibit a diversity of research perspectives that make use of theoretical approaches mostly taken from social science disciplines or economics. Theoretical concerns may have received less attention due to emphasis placed on the empirical description and monitoring of individual case areas where theory was used not out of paradigmatic concerns but for the practical purpose of describing and conceptualizing empirical findings. Such an empiricist stance is somewhat remarkable given their appearance in referred journals, and some such papers do not settle on one theory but instead offer a combination of conceptual points in order to frame their empirical study or to draw conclusions from its results. That being said, the explorations do not amount to a coherent framework but are rooted in different theoretical legacies. Their starting points are work on path dependencies that focuses on historical or local conditions, cluster and process theories, diffusion theory approaches, and arguments based either on the capability approach or following concepts of social capital or resource distribution (e.g., Nuur/Laestadius 2010; Mack 2014; Salemink/Strijker/Bosworth 2017a, b; Onitsuka/Hoshino 2018; Hoque 2020). They also reference the Technology Acceptance Model (Correa/Pavez 2016). Moreover, in terms of viable approaches to digital participation in rural development, the focus tends to be on endeavours aimed at creating digital opportunities in the first place. The term participation is therefore used to describe participation in creating digital connectivity rather than participation through digital opportunities or participation in designing such opportunities.

Against this background, research featuring pioneering examples of more extensive and also digitally driven participation in rural areas detects a mix of contextual factors (social networks, demographics) as well as individual factors (personality, motivations, willingness to innovate) (e.g., Correa/Pavez 2016: 257–260; Larty/Jack/Lockett 2017: 1003–1005; Roberts/Anderson/Skerratt et al. 2017: 374–375; Onitsuka/Hoshino 2018: 132–134). Along with assumptions of diffusion theory, to which some of the papers subscribe (e.g., Reggi/Arduini/Biagetti et al. 2014; Salemink/Strijker/Bosworth 2017a), this also involves seizing the opportunities of information and communication technologies that depend on various attributes of a specific region, e.g., its proximity to a city, its financial means or its knowledge-intensive businesses. Yet there seems no automatism here. As one study showed, broadband access in rural areas need not go hand-in-hand with the establishment of knowledge-intensive arrays of companies from

high-tech or creative industries, which often remain bound to the city (Mack 2014). This hence dismisses the assumption of a “death of distance” and instead accentuates the significance of particular spatial coordinates that may vary from one area to another.³

Another common reference was to clusters that were understood as a spatial concentration of people, resources, ideas or infrastructure. Such clusters form a complex assemblage with dynamic internal interactions. The reference is taken up, for example, in articles dealing with digitalization in industry or economic development that draw on theories of the digital divide and new forms of a digitally driven reorganization of work (Nuur/Laestadius 2010; Braesemann/Lehdonvirta/Kässi 2020). In addition to companies in networked businesses, such clusters could also include most sorts of organizations, e.g., research institutions, universities, chambers of commerce, public authorities or financial intermediaries. In this context, some of the articles share an interest in network analysis approaches (Onitsuka/Hoshino 2018; Schmidt/Müller/Ibert et al. 2018; van Aswegen/Retief 2020). They demonstrate that networking, the establishment of digital infrastructures and the offerings that build on them have not weakened spatial references or local ties. On the contrary, these have been strengthened and maintained through a combination of analogue and digital formats. In addition, actors in intermediary positions are considered crucial when it comes to area-specific development. Especially the relevance of people in intermediary positions who bring together individual and organizational resources, is stressed in the context of support measures for digital approaches in local participation and their integration into existing or emerging development processes (e.g., Larty/Jack/Lockett 2017: 1004). Usually, this view favours a framework for neo-endogenous area-specific development that also takes external resources into account. So, such articles frequently reference theoretizations of (neo-)endogenous development and point to interactions between top-down and bottom-up measures (e.g., Roberts/Anderson/Skerratt et al. 2017: 380; Salemink/Strijker/Bosworth 2017b; Salemink/Strijker 2018). They underscore that successful forms of participatory ventures in digital development are based on bottom-up processes that are supported and accompanied by top-down measures. When carried out by civic initiatives, local interests can be more strongly incorporated into development schemes.

This kind of setting is important as it allows continuous

³ The phrase refers to the book “The death of distance” (Cairncross 1997) in which the author depicts how telecommunication, the internet and wireless technology help to overcome physical location as a barrier to communication.

engagement and support for a digitally sustained development process throughout the different steps of its completion. Maintaining the necessary commitment from various stakeholders is also deemed to be pivotal, especially because establishing digital technologies can also result in setbacks. Such work thereby ignores the non-linear progression of social innovation and digital development and can be voluntaristic in its approach (Nuur/Laestadius 2010: 302–303).

However, only a small number of articles address the evaluation of programs in general. Regardless of this shortcoming, all articles make policy recommendations, discuss regulatory issues and consider area-specific self-organization. In conclusion, the articles contend that self-organization is not necessarily successful. If so, it continues to rely on sustained government support. Financial and technical resources are not only needed to set up civic initiatives for development but have to be made available throughout the process. This means that local authorities play a key role in implementing projects and motivating citizens. They thereby contribute to the sustainable development of digital services.

5 Lessons learned

5.1 Enduring digital inequity

The studies in our sample make clear that digitalization in rural areas continues to remain uneven in terms of both technological access and participation in digital services. Overall, area-specific disparities are neither balanced nor reduced because new inequities supplement existing ones that cannot be eliminated by digitalization. Digitalization is thus considered to be an ambivalent process: it does not necessarily lead to more connectivity and participation but unfolds unevenly. If connectivity increased, this was the result of efforts to extend people’s capacities, to establish use patterns and to foster exchange between the different stakeholders involved coupled with favourable socio-demographic factors.

Disagreement over the beneficial consequences of digitalization on the one hand and its negative effects on the other hand forms part of this checkered picture. Therefore, quite in line with early optimistic positions, articles that refer to successful strategies or projects focus on technology provision which, however, continues to be less advanced than in urban areas (Philip/Cottrill/Farrington et al. 2017; Salemink/Strijker/Bosworth 2017a, b). Moreover, despite all efforts to install high-speed internet, empirical studies show that access to broadband does not necessarily make rural areas more attractive, e.g., by promoting mobile and flex-

ible working conditions (Onitsuka/Hoshino 2018; Braesemann/Lehdonvirta/Kässi 2020;). Nevertheless, the articles stress the infrastructural deficit in rural areas where the first-level digital divide still plays a role.

In that respect, authors such as Yu, Lin and Liao (2017: 196) conclude that “digital inequality is one of the most critical issues in the ‘information age’ [and] few studies have examined the social inequality in information resources and digital use patterns. In the rural areas, such information communication technology (ICT) facilities could not guarantee that users can easily access information technology and overcome the so-called ‘digital divide.’” Next to non-access, the debate focuses on questions pertaining to a second-level digital divide concerning the disparate skills and competencies available for dealing with technologies. It also takes issue with a third-level digital divide that results from unequal access and differentiated forms of technology use (van Deursen/Helsper 2015; Li/Chen/Wu 2020). The various divides are linked and can only be separated for analytical reasons. They are associated with a range of deleterious factors like limited resources for knowledge management, overaged populations and limited access to telecommunication infrastructures. In this context, strategies which only concentrate on providing the technological basis of digitalization risk exacerbating rural marginalization (Bock 2016).

To avoid this paradoxical consequence, ventures that want to promote digitalization must seek to overcome knowledge gaps and offer opportunities for participation both in local processes and in policymaking. More precisely, they need to foster bottom-up initiatives toward area-specific development. This echoes Saleminck, Strijker and Bosworth (2017a) who stress the intersection of technological connectivity and digital inclusion and demand place-specific and community-specific policies. This requires, they argue, interlacing community ventures with market incentives and rethinking the role of local and national governments which have, to date, usually reacted to shortcomings but have done little to anticipate future demands (see also Pant/Hambly Odame 2017). Due to the focus of Saleminck, Strijker and Bosworth’s (2017a) review, their proposed community-based agenda does not embrace civic participation. Yet it seems crucial to involve those living in rural areas who are thus affected by any measures taken in order to bring together various local needs and to allow people to voice their concerns. As our review underscores, sustainable digitalization presupposes participatory efforts that are far from monolithic. Substantial kinds of citizen empowerment crisscross digital and analogue formats: making an initiative more digital does not necessarily make it more interactive and, vice versa, analogue initiatives are not per se more inclusive or participatory.

5.2 Reiterating and reconfiguring the urban-rural divide

Beyond the either affirmative or critical views on digitalization, insisting on the idea of rural inequality can also be used to legitimize a policy that pits urban and rural areas against each other. By means of this contrast, rural areas can be perceived as requiring development in order to level up to cities. This however tends to reinforce the impression of existing disparities – even from initiatives that are expected to address them. In this respect, the thematization of digitalization is primarily associated with the infrastructural task of broadband supply. On the one hand, this preoccupation with technology reflects the insufficient nature of telecommunications connectivity in many areas. On the other, it makes us aware of the general technology-oriented approach toward digitalization. It also challenges any clear separation between urban and rural spaces and instead highlights their interdependence. That said, we found only a very small number of comparative studies of rural areas or examining urban and rural places (Philip/Cottrill/Farrington et al. 2017; Braesemann/Lehdonvirta/Kässi 2020). This kind of comparison would allow us not only to assess the extent to which rural and urban areas contrast, but also to acknowledge the peculiarities of rural areas.

Articles in our sample argue that the dominance of technology-focused endeavours even obscures the fact that areas follow their own specific path of development, which is difficult to align with routes taken by other regions (e.g., Nuur/Laestadius 2010; Saleminck/Strijker/Bosworth 2017b). Moreover, it sidelines concepts for rural revitalization that go beyond technology. Based on the results of the systematic review, it seems that digitalization only has a limited effect on the formation of long-distance connections at the expense of local relations. Hence, what is considered peripheral and what is central is not so much a matter of geographical distance but a social and discursive construct. In effect, we are witnessing the hybridization of urban-rural relationships whereby rurality can be performed in the city and remote places can develop an urban sense of place (Matern/Binder/Noack 2020; Shaw/Sui 2020). As a result, some authors urge us to focus on smart regions, not on any particular geographical location (Lyshchikova/Stryabkova/ Glotova et al. 2019). This also shifts our perspective from seeing villages as inherently homogeneous and vulnerable toward appreciating the diversity of lifestyles and the resources for resilience found in them (Roberts/Anderson/Skerratt et al. 2017; Noack/Federwisch 2019).

5.3 Disregarding the smart village

In the journal articles, the notion of the smart village provokes little critical response. Instead, the contributions operate with connate terms, e.g., innovation, social innovation or user-driven innovation (as opposed to technology-driven innovation), yet often without clarifying underlying terminological differentiations. In fact, the smart village appears to be conceptualized through a range of different shades of smartness (Naldi/Nilsson/Westlund et al. 2015).

Arguably, the lack of critical engagement with emerging concepts of digital and participatory approaches in rural areas may become problematic. Not only are approaches to (neo)endogenous development in need of scrutiny; the figure of the “actually existing smart citizen” (Shelton/Lodato 2019: 37) is in itself open to debate. By disregarding these issues, academic research risks reducing its influence on an ongoing political process seeking to foster the optimal development of rural areas (ENRD 2018a; Merlin/Bickert 2020). Other concepts, for example social innovation, could also be seen as inspiring much-needed research on digitalization and participation (e.g., Novikova 2021: 79; Sept 2020).

Furthermore, the dominance of smart cities in current research may be due to the fact that smart cities represent a more clearly defined object of study. By contrast, rural areas seem to have porous boundaries or are conceptualized only as being “not urban”. This lack of inquisitiveness into the digitally networked and participatory smart village is, in fact, not only a scientific shortcoming. It is even more problematic when academic disengagement reflects more general public disinterest in attending to the spread of digital technologies in rural areas and their ramifications for civic power (Cowie/Townsend/Salemink 2020). The absence of a critical public means that the impact of commercial ventures and governmental actions are not interrogated by the local actors affected by such measures. This could reinforce power imbalances and the untransparent nature of decision-making processes (Bosworth/Atterton 2012; Johansen/Chandler 2015). This holds true for area-specific development processes that aim to reconcile grassroots initiatives with administrative efforts. They form complex settings of both endogenous and exogenous impulses which need to be balanced and critically monitored, too.

6 Conclusion

Our analysis documents the state of research in journal publications on digitalization and participation in rural areas. First of all, many articles focus on projects that seek to expand telecommunications (broadband) capacities. However, most of the studies caution against focusing only on

the technological component of digitalization as this could lead to neglect of the social contexts of application and the capacities of local actors. As a result, a starting point of existing research in peer-reviewed articles is that state interventions have not been sufficient to establish equivalent digital networks and services in rural areas. Accordingly, broadband coverage is treated as an infrastructure prerequisite for further development.

The second pertinent issue regards the territorial characteristics of rural areas that would condition the implementation of digitally based procedures. The research shows that the administrative and corporate schemes in place pay little attention to the multi-layered urban-rural relationships and the specifics of rural areas. In order to incorporate the spatial peculiarities of rural areas and to avoid taking urban environments as the default, there needs to be a move away from primarily technology-oriented digitalization approaches toward participatory endeavours.

The third focus in the available research is on local social networks and intermediate agents with an emphasis on the integration of top-down measures with bottom-up initiatives. Participatory approaches in which top-down measures and bottom-up initiatives intertwine enable a constructive use of exogenous and endogenous resources. This means that they are crucial for implementing the vision of digitally networked smart areas or smart villages. This thus prioritizes the establishment of digital social innovations, from broadband supply to e-services.

Although digitalization and participation are long-term issues in rural development and have been gaining traction since the 2010s, this was not reflected in the scientific articles we sampled. In fact, several articles featured in the review state that digital innovations and digitalization in rural areas are a niche topic (e.g., Roberts/Anderson/Skerratt et al. 2017: 372). Furthermore, the articles in our sample are less concerned with digital development or participation approaches than with the state of ICT supply, the necessary (or lack of) competencies for seizing technological potential and the difficulties of digitalization in rural areas. A consideration of additional sources might have increased the corpus and scope of our review since tangible efforts to digitally foster participation and discussion of best practices are more likely to be found in white papers, conference papers or workshop presentations. Because the topic is multidisciplinary and still emerging it is not only addressed by different disciplines, for example, sociology, political science, regional sciences and engineering, but in different types of publications and venues, as the subject is also of prime concern for actors in spheres beyond academia such as industry and politics (Lakshmanan/Chockalingam/Murty et al. 2022).

Overall, our study contributes to a better understanding of the ways in which information and communication technologies enable citizens to participate in digitally driven developments in rural areas and the preconditions that are associated with this. Arguably, knowledge of the deficits in digitalization in rural areas is necessary both for further research and for policymaking in order to interrogate and then also mitigate spatial disparities and structural deficits, to strengthen the competitiveness of rural areas vis-à-vis urban regions, and to meet the demand for inclusive political action. Furthermore, such research-based knowledge can help political authorities adjust their actions to particular local circumstances, including area-specific civic and institutional efforts and demands. This involves managing and better aligning socio-spatial structures, available capacities and digitalization enterprises (Jansson 2013; Pant/Hambly Odame 2017).

It is important to note that in a sense all these findings have been rendered provisional by the Covid-19 pandemic. Due to the scope of sampling and the study's design being completed in the early months of the pandemic, reflections on the enormous changes brought by the global spread of the disease and its multifarious ramifications were not considered. As of now, there is a burgeoning field of scholarship that is gradually condensing in scientific refereed journals, also in terms of reconsidering the conceptualization of divides between urban and rural regions, the collection of data and suitable policy initiatives. According to the still inconclusive research, it can be assumed that the focus is on policy responses with recent papers touching upon fields like surveillance (e.g., Runkle/Sugg/Graham et al. 2021; Shcherbak/Gryshchenko/Ganushchak-Yefimenko et al. 2021) and telehealth (e.g., Clare 2021). Synthesizing these efforts will be a cardinal step in assessment of the impact of such a profound and widespread state of emergency and the measures taken to overcome it for the long-term transformation of rural areas.

Arguably, in this fundamentally new situation, it might become possible to shift the discourse on digitally driven, networked development away from the smart city and toward rural areas (Dalton/Wilmott/Fraser et al. 2020). While smart city concepts have been a topic of debate and scientific inquiry since the 1990s, with diverse research fields including mobility, environmental issues and smart governance, there is no comparably broad interest in rural areas. The research landscape of journal publications remains dominated by smart cities, while key concepts like participation and digitalization, along with processes of mediatization and algorithmization, are usually discussed without any consideration of spatial aspects (Haefner/Sternberg 2020). This might be the case because there once was the idea that place loses its importance in network societies – a proposi-

tion at odds with the state of research and people's day-to-day experiences.

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References

- Arnstein, S.R. (1969): A Ladder of Citizen Participation. In: *Journal of the American Planning Association* 35, 4, 216–224. <https://doi.org/10.1080/01944366908977225>
- Barns, S.; Cosgrave, E.; Acuto, M.; McNeill, D. (2017): Digital Infrastructures and Urban Governance. In: *Urban Policy and Research* 35, 1, 20–31. <https://doi.org/10.1080/08111146.2016.1235032>
- Bibri, S.E.; Krogstie, J. (2017): Smart sustainable cities of the future: An extensive interdisciplinary literature review. In: *Sustainable Cities and Society* 31, 183–212. <https://doi.org/10.1016/j.scs.2017.02.016>
- Bock, B.B. (2016): Rural Marginalisation and the Role of Social Innovation. A Turn Towards Nexogenous Development and Rural Reconnection. In: *Sociologia Ruralis* 56, 4, 552–573. <https://doi.org/10.1111/soru.12119>
- Bosworth, G.; Atterton, J. (2012): Entrepreneurial In-migration and Neoenogenous Rural Development. In: *Rural Sociology* 77, 2, 254–279. <https://doi.org/10.1111/j.1549-0831.2012.00079.x>
- Braesemann, F.; Lehdonvirta, V.; Kässi, O. (2020): ICTs and the urban-rural divide: can online labour platforms bridge the gap? In: *Information, Communication and Society*. <https://doi.org/10.1080/1369118X.2020.1761857>
- Bürgin, R.; Mayer, H. (2020): Digital Periphery? A Community Case Study of Digitalization Efforts in Swiss Mountain Regions. In: Patnaik, S.; Sen, S.; Mahmoud, M.S. (eds.): *Smart Village Technology: Concepts and Developments*. Cham, 67–98. https://doi.org/10.1007/978-3-030-37794-6_4
- Cairncross, F. (1997): *The death of distance. How the communications revolution will change our lives*. Boston.
- Chapman, R.; Slaymaker, T. (2002): *ICTs and Rural Development: Review of the Literature, Current Interventions and Opportunities for Action*. London. = ODI Working Paper 192.
- Christmann, G. B. (2016): Analysing Changes in Discursive Constructions of Rural Areas in the Context of Demographic Change. Towards Counterpoints in the Dominant Discourse on “Dying Villages”. In: *Comparative Population Studies* 41, 3-4, 359–378. <https://doi.org/10.12765/CPoS-2017-03>
- Clare, C.A. (2021): Telehealth and the digital divide as a social determinant of health during the COVID-19 pan-

- demic. In: *Network Modeling Analysis in Health Informatics and Bioinformatics* 10, 1, 26. <https://doi.org/10.1007/s13721-021-00300-y>
- Cohen, J.M.; Uphoff, N.T. (1980): Participation's place in rural development: Seeking clarity through specificity. In: *World Development* 8, 3, 213–235. [https://doi.org/10.1016/0305-750X\(80\)90011-X](https://doi.org/10.1016/0305-750X(80)90011-X)
- Commins, P. (2004): Poverty and Social Exclusion in Rural Areas: Characteristics, Processes and Research Issues. In: *Sociologia Ruralis* 44, 1, 60–75. <https://doi.org/10.1111/j.1467-9523.2004.00262.x>
- Correa, T.; Pavez, I. (2016): Digital Inclusion in Rural Areas: A Qualitative Exploration of Challenges faced by People from Isolated Communities. In: *Journal of Computer-Mediated Communication* 21, 3, 247–263. <https://doi.org/10.1111/jcc4.12154>
- Cowie, P.; Townsend, L.; Salemink, K. (2020): Smart rural futures: Will rural areas be left behind in the 4th industrial revolution? In: *Journal of Rural Studies* 79, 169–176. <https://doi.org/10.1016/j.jrurstud.2020.08.042>
- Dalton, C.; Wilmott, C.; Fraser, E.; Thatcher, J. (2020): “Smart” Discourses, the Limits of Representation, and New Regimes of Spatial Data. In: *Annals of the American Association of Geographers* 110, 2, 485–496. <https://doi.org/10.1080/24694452.2019.1665493>
- ENRD – European Network for Rural Development (2016): Cork 2.0 Declaration “A Better Life in Rural Areas”. Luxembourg.
- ENRD – European Network for Rural Development (2018a): Smart Villages. Revitalising Rural Services. Luxembourg. = EU Rural Review 26.
- ENRD – European Network for Rural Development (2018b): Digital and social innovation in rural services. Luxembourg.
- Erdiaw-Kwasie, M.O.; Alam, K. (2016): Towards understanding digital divide in rural partnerships and development: A framework and evidence from rural Australia. In: *Journal of Rural Studies* 43, 214–224. <https://doi.org/10.1016/j.jrurstud.2015.12.002>
- Esteban-Navarro, M.-Á.; García-Madurga, M.-Á.; Morte-Nadal, T.; Nogales-Bocio, A.-I. (2020): The Rural Digital Divide in the Face of the COVID-19 Pandemic in Europe – Recommendations from a Scoping Review. In: *Informatics* 7, 4, 54, 1–18. <https://doi.org/10.3390/informatics7040054>
- European Commission (2020): Pilot Project: Smart eco-social villages. Final Report. Luxembourg.
- Franke, S.; Magel, H. (eds.) (2018): Digitalisierung. Neue Plattformen für Beteiligung und Demokratie auf dem Land? München. = HSS Argumente und Materialien zum Zeitgeschehen 108.
- Haefner, L.; Sternberg, R. (2020): Spatial implications of digitization: State of the field and research agenda. In: *Geography Compass* 14, 12, e12544. <https://doi.org/10.1111/gec3.12544>
- Hambly, H.; Rajabiun, R. (2021): Rural broadband: Gaps, maps and challenges. In: *Telematics and Informatics* 60, 101565. <https://doi.org/10.1016/j.tele.2021.101565>
- Hindman, D. (2000): The Rural-Urban Digital Divide. In: *Journalism and Mass Communication Quarterly* 77, 3, 549–560. <https://doi.org/10.1177/107769900007700306>
- Hollands, R.G. (2008): Will the real smart city please stand up? In: *City* 12, 3, 303–320. <https://doi.org/10.1080/13604810802479126>
- Hoque, M.R. (2020): The impact of the ICT4D project on sustainable rural development using a capability approach: Evidence from Bangladesh. In: *Technology in Society* 61, 101254. <https://doi.org/10.1016/j.techsoc.2020.101254>
- Ievoli, C.; Belligiano, A.; Marandola, D.; Milone, P.; Ventura, F. (2019): Information and Communication Infrastructures and New Business Models in Rural Areas: The Case of Molise Region in Italy. In: *European Country-side* 11, 4, 475–496. <https://doi.org/10.2478/euco-2019-0027>
- Jansson, A. (2013): Mediatization and social space: Reconstructing mediatization for the transmedia age. In: *Communication Theory* 23, 3, 279–296. <https://doi.org/10.1111/comt.12015>
- Johansen, P.H.; Chandler, T.L. (2015): Mechanisms of power in participatory rural planning. In: *Journal of Rural Studies* 40, 12–20. <https://doi.org/10.1016/j.jrurstud.2015.05.006>
- Kaczorowski, W.; Swarat, G. (2018): Smartes Land: Von der Smart City zur Digitalen Region. Impulse für die Digitalisierung ländlicher Regionen. Glückstadt.
- Komorowski, Ł.; Stanny, M. (2020): Smart Villages: Where Can They Happen? In: *Land* 9, 5, 151. <https://doi.org/10.3390/land9050151>
- Lakshmanan, V.I.; Chockalingam, A.; Murty, V.K.; Kalyanasundaram, S. (eds.) (2022): Smart Villages. Bridging the Global Urban-Rural Divide. Cham. <https://doi.org/10.1007/978-3-030-68458-7>
- Lan, C.I.-C.; Peng, L.-P. (2018): E-Participation, Rural Regime, and Network Governance: A Case of Balien River Conservation. In: *Sustainability* 10, 11, 3908. <https://doi.org/10.3390/su10113908>
- Larty, J.; Jack, S.; Lockett, N. (2017): Building Regions: A Resource-Based View of a Policy-Led Knowledge Exchange Network. In: *Regional Studies* 51, 7, 994–1007. <https://doi.org/10.1080/00343404.2016.1143093>
- Li, R.; Chen, K.; Wu, D. (2020): Challenges and Opportunities for Coping with the Smart Divide in Rural America. In: *Annals of the American Association of*

- Geographers 110, 2, 559–570. <https://doi.org/10.1080/24694452.2019.1694402>
- Lyshchikova, J.V.; Stryabkova, E.A.; Glotova, A.S.; Dobrodromova, T.N. (2019): The ‘Smart Region’ Concept: The Implementation of Digital Technology. In: *Journal of Advanced Research in Law and Economics* 10, 4, 1338–1345. [https://doi.org/10.14505/jarle.v10.4\(42\).34](https://doi.org/10.14505/jarle.v10.4(42).34)
- Mack, E. A. (2014): Broadband and knowledge intensive firm clusters: Essential link or auxiliary connection? In: *Papers in Regional Science* 93, 1, 3–29. <https://doi.org/10.1111/j.1435-5957.2012.00461.x>
- Magnusson, D.; Hermelin, B. (2019): ICT development from the perspective of connectivity and inclusion. The operation of a local digital agenda in Sweden. In: *Norsk Geografisk Tidsskrift – Norwegian Journal of Geography* 73, 2, 81–95. <https://doi.org/10.1080/00291951.2019.1596153>
- Matern, A.; Binder, J.; Noack, A. (2020): Smart regions: insights from hybridization and peripheralization research. In: *European Planning Studies* 28, 10, 2060–2077. <https://doi.org/10.1080/09654313.2019.1703910>
- Meijers, E.; van der Wouw, D. (2019): Struggles and strategies of rural regions in the age of the ‘urban triumph’. In: *Journal of Rural Studies* 66, 21–29. <https://doi.org/10.1016/j.jrurstud.2019.01.027>
- Merlin, C.; Bickert, M. (2020): Digitalisierung und ländliche Räume – Fördermaßnahmen des BMEL in der ländlichen Entwicklung. In: *Zeitschrift für Geodäsie, Geoinformation und Landmanagement* 145, 2, 80–89. <https://doi.org/10.12902/zfv-0293-2020>
- Meyn, M. (2020): Digitalization and Its Impact on Life in Rural Areas: Exploring the Two Sides of the Atlantic: USA and Germany. In: Patnaik, S.; Sen, S.; Mahmoud, M.S. (eds.): *Smart Village Technology: Concepts and Developments*. Cham, 99–116. https://doi.org/10.1007/978-3-030-37794-6_5
- Naldi, L.; Nilsson, P.; Westlund, H.; Wixe, S. (2015): What is smart rural development? In: *Journal of Rural Studies* 40, 90–101. <https://doi.org/10.1016/j.jrurstud.2015.06.006>
- Noack, A.; Federwisch, T. (2019): Social Innovation in Rural Regions: Urban Impulses and Cross-Border Constellations of Actors. In: *Sociologia Ruralis* 59, 1, 92–112. <https://doi.org/10.1111/soru.12216>
- Novikova, M. (2021): Transformative Social Innovation in Rural Areas: Insights from a Rural Development Initiative in the Portuguese Region of Baixo Alentejo. In: *European Countryside* 13, 1, 71–90. <https://doi.org/10.2478/euco-2021-0005>
- Nuur, C.; Laestadius, S. (2010): Development in peripheral regions: Case studies in Sweden. In: *European Urban and Regional Studies* 17, 3, 293–307. <https://doi.org/10.1177/0969776409352156>
- Onitsuka, K.; Hoshino, S. (2018): Inter-community networks of rural leaders and key people: Case study on a rural revitalization program in Kyoto Prefecture, Japan. In: *Journal of Rural Studies* 61, 123–136. <https://doi.org/10.1016/j.jrurstud.2018.04.008>
- Pant, L.P.; Hambly Odame, H. (2017): Broadband for a sustainable digital future of rural communities: A reflexive interactive assessment. In: *Journal of Rural Studies* 54, 435–450. <https://doi.org/10.1016/j.jrurstud.2016.09.003>
- Philip, L.; Cottrill, C.; Farrington, J.; Williams, F.; Ashmore, F. (2017): The digital divide: Patterns, policy and scenarios for connecting the ‘final few’ in rural communities across Great Britain. In: *Journal of Rural Studies* 54, 386–398. <https://doi.org/10.1016/j.jrurstud.2016.12.002>
- Pretty, J.N. (1995): Participatory learning for sustainable agriculture. In: *World Development* 23, 8, 1247–1263. [https://doi.org/10.1016/0305-750X\(95\)00046-F](https://doi.org/10.1016/0305-750X(95)00046-F)
- Reggi, L.; Arduini, D.; Biagetti, M.; Zanfei, A. (2014): How advanced are Italian regions in terms of public e-services? The construction of a composite indicator to analyze patterns of innovation diffusion in the public sector. In: *Telecommunications Policy* 38, 5–6, 514–529. <https://doi.org/10.1016/j.telpol.2013.12.005>
- Rehfeld, D.; Terstriep, J. (2019): Regional governance in North Rhine-Westphalia – lessons for smart specialisation strategies? In: *Innovation: The European Journal of Social Science Research* 32, 1, 85–103. <https://doi.org/10.1080/13511610.2018.1520629>
- Roberts, E.; Anderson, B.A.; Skerratt, S.; Farrington, J. (2017): A review of the rural-digital policy agenda from a community resilience perspective. In: *Journal of Rural Studies* 54, 372–385. <https://doi.org/10.1016/j.jrurstud.2016.03.001>
- Runkle, J.D.; Sugg, M.M.; Graham, G.; Hodge, B.; March, T.; Mullendore, J.; Tove, F.; Salyers, M.; Valeika, S.; Vaughan, E. (2021): Participatory COVID-19 Surveillance Tool in Rural Appalachia: Real-Time Disease Monitoring and Regional Response. In: *Public Health Reports* 136, 3, 327–337. <https://doi.org/10.1177/0033354921990372>
- Salemink, K.; Strijker, D. (2018): The participation society and its inability to correct the failure of market players to deliver adequate service levels in rural areas. In: *Telecommunications Policy* 42, 9, 757–765. <https://doi.org/10.1016/j.telpol.2018.03.013>
- Salemink, K.; Strijker, D.; Bosworth, G. (2017a): Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in

- rural areas. In: *Journal of Rural Studies* 54, 360–371. <https://doi.org/10.1016/j.jrurstud.2015.09.001>
- Salemink, K.; Strijker, D.; Bosworth, G. (2017b): The Community Reclaims Control? Learning Experiences from Rural Broadband Initiatives in the Netherlands. In: *Sociologia Ruralis* 57, S1, 555–575. <https://doi.org/10.1111/soru.12150>
- Schmidt, S.; Müller, F.C.; Ibert, O.; Brinks, V. (2018): Open Region: Creating and exploiting opportunities for innovation at the regional scale. In: *European Urban and Regional Studies* 25, 2, 187–205. <https://doi.org/10.1177/0969776417705942>
- Schulte, B. (2015): (Dis)Empowering technologies: ICT for education (ICT4E) in China, past and present. In: *Chinese Journal of Communication* 8, 1, 59–77. <https://doi.org/10.1080/17544750.2014.990909>
- Sept, A. (2020): Thinking Together Digitalization and Social Innovation in Rural Areas: An Exploration of Rural Digitalization Projects in Germany. In: *European Countryside* 12, 2, 193–208. <https://doi.org/10.2478/euco-2020-0011>
- Shaw, S.-L.; Sui, D. (2020): Understanding the New Human Dynamics in Smart Spaces and Places: Toward a Spatial Framework. In: *Annals of the American Association of Geographers* 110, 2, 339–348. <https://doi.org/10.1080/24694452.2019.1631145>
- Shcherbak, V.; Gryshchenko, I.; Ganushchak-Yefimenko, L.; Nifatova, O.; Tkachuk, V.; Kostiuk, T.; Hotra, V. (2021): Using a sharing-platform to prevent a new outbreak of COVID-19 pandemic in rural areas. In: *Global Journal of Environmental Science and Management* 7, 2, 155–170. <https://doi.org/10.22034/gjesm.2021.02.01>
- Shelton, T.; Lodato, T. (2019): Actually existing smart citizens. In: *City* 23, 1, 35–52. <https://doi.org/10.1080/13604813.2019.1575115>
- Slee, B. (2019): Delivering on the Concept of Smart Villages – in Search of an Enabling Theory. In: *European Countryside* 11, 4, 634–650. <https://doi.org/10.2478/euco-2019-0035>
- Townsend, L.; Wallace, C.; Fairhurst, G. (2015): ‘Stuck Out Here’: The Critical Role of Broadband for Remote Rural Places. In: *Scottish Geographical Journal* 131, 3-4, 171–180. <https://doi.org/10.1080/14702541.2014.978807>
- van Aswegen, M.; Retief, F.P. (2020): The role of innovation and knowledge networks as a policy mechanism towards more resilient peripheral regions. In: *Land Use Policy* 90, 104259. <https://doi.org/10.1016/j.landusepol.2019.104259>
- van Deursen, A.J.A.M.; Helsper, E.J. (2015): The Third-Level Digital Divide: Who Benefits Most from Being Online? In: Robinson, L.; Cotten, S.R.; Schulz, J.; Hale, T.M.; Williams, A. (eds.): *Communication and Information Technologies Annual. Digital Distinctions and Inequality*. Bingley, 29–52. <https://doi.org/10.1108/S2050-206020150000010002>
- Vinod Kumar, T.M. (ed.) (2017): *Smart Economy in Smart Cities*. International Collaborative Research: Ottawa, St. Louis, Stuttgart, Bologna, Cape Town, Nairobi, Dakar, Lagos, New Delhi, Varanasi, Vijayawada, Kozhikode, Hong Kong. Singapore. <https://doi.org/10.1007/978-981-10-1610-3>
- Visvizi, A.; Lytras, M.D. (2018): It’s Not a Fad: Smart Cities and Smart Villages Research in European and Global Contexts. In: *Sustainability* 10, 8, 2727. <https://doi.org/10.3390/su10082727>
- Visvizi, A.; Lytras, M.D.; Mudri, G. (2019): Smart Villages: Relevance, Approaches, Policymaking Implications. In: Visvizi, A.; Lytras, M.D.; Mudri, G. (eds.): *Smart villages in the EU and beyond*. Bingley, 1–12. <https://doi.org/10.1108/978-1-78769-845-120191002>
- Weaver, D.; Wilhoit, G.C. (1988): A Profile of JMC Educators: Traits, Attitudes and Values. In: *The Journalism Educator* 43, 2, 4–41. <https://doi.org/10.1177/107769588804300202>
- Yu, T.-K.; Lin, M.-L.; Liao, Y.-K. (2017): Understanding factors influencing information communication technology adoption behavior: The moderators of information literacy and digital skills. In: *Computers in Human Behavior* 71, 196–208. <https://doi.org/10.1016/j.chb.2017.02.005>