

Transferring Smart City Concepts to Smaller Urban and Rural Contexts: A Systematic Literature Review

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1. Introduction and Research Design

A smart city (SC) leverages new technologies, such as information and communication technologies (ICTs), to enhance urban management and improving residents' quality of life. Others define technologically based projects aiming to improve quality of life throughout a variety of dimensions such as economic improvement, social stability, and environment as "smart developments" [1, 2]. Moreover, a relatively new concept has emerged – that of the "smart village", which focuses on enhancing development aspects in rural areas through digital technologies and involving the local population in their development, seeking to reflect the demographic transformation from rural settlements into smaller towns, then (small) cities, and even megacities [1, 3]. Therefore, it is essential to evaluate smart city projects against social, economic and environmental criteria to determine their success and to foster continuous improvement and learning [3]. Large cities are currently at the centre of smart city analysis and indexes; there is a clear lack of attention on medium and small cities. Assessment models for small cities are crucial for their development, as there is a need for tailored models to support small smart cities and regions, focusing on innovative, financially feasible solutions to enhance quality of life [4]. This paper lays out the state of the art in the field of smart cities and regions with a focus on sustainability aspects (such as governance, social, economic and environmental dimensions) and identifies the characteristics that can be transferred to smaller-scale urban and non-urban contexts.

We conducted a systematic literature review to identify how smart-city-related concepts are transferred to smaller contexts by using the following search on Scopus: ((TITLE-ABS-KEY ("Small municipalit*") OR TITLE-ABS-KEY ("small cit*") OR TITLE-ABS-KEY ("small town*") OR TITLE-ABS-KEY ("peri-urban")) AND TITLE-ABS-KEY ("smart cit*")). The results included 155 papers published from 2013 onwards. After an initial abstract and title screening, 40 papers were selected and read fully. Thereafter, the final sample consisted of 18 publications based on a content screening approach.

2. Preliminary Results

The following table presents the main aspects extracted from the literature, grouped thematically into seven main categories.

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Category	Main findings
<i>characteristics of small cities</i>	project types and strategic planning, inclusive stakeholder engagement, adaptability and low inertia to change, bottom-up and agile approaches, scalability challenges and resource allocation, sharing best practices and experiences, resource constraints in small towns, smart city definitions and scale
<i>decision support and policy process</i>	data implementation for decision support, challenges in using big data for decision-making, technological advancements in new cities. support for integrated policies via technology, focus on technology testing over urban challenges, capacity issues in managing big data, importance of sustainable public policies
<i>technology</i>	Geographic Information System (GIS) software utilisation, traffic simulation, challenges in system integration and data accessibility, real-time urban monitoring through ICT, intelligent transportation systems (ITS)
<i>social aspects</i>	ICT accessibility and local strengths, participation of social actors, prioritisation and ranking of social factors, societal readiness for digital transformation, inequality in cities
<i>governance and policy-making</i>	adaptability of governance, advanced digital and engineering solutions, barriers in implementation, innovation in public administration, IT security and data protection, influence of internal and external environments
<i>innovation dimensions</i>	crowdsourcing and citizen participation, intelligent transport systems (ITS), collaborative urban planning and technology, digital economy development in small towns
<i>input for smart city applications</i>	public dataset utilisation, data framework and real-time analytics, geodatabases, crowdsourcing and lessons learned, transit and emergency management systems, data needs and smartness levels, promotion of local data and open data initiatives

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