

## Finding the Interrelation between Smart City Initiatives and International Development Cooperation: A Critical Analysis of Current Project Processes and Underlying Motivations



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**ABSTRACT:** This paper aims to explore the interplay between smart city projects and international development cooperation initiatives while identifying potential challenges associated with their ongoing processes. Numerous studies have investigated the potential economic development opportunities through smart city initiatives at the local level. This paper contributes to existing literature by examining the convergence of smart city and international development projects, providing a comprehensive perspective on these projects in terms of governance, motivation, financing, and inclusivity. This research includes a critical assessment of these projects, with the hope that both communities can actively engage in dialogue and cooperation to share their shortcomings and successful experiences, ultimately achieving a 'smart' balance in their development landscape.

**KEYWORDS:** smart city, international development, ODA, economic development

### I. INTRODUCTION

There are striking parallels between smart city initiatives and international development cooperation projects. This similarity stems from shared objectives, involvement of multiple stakeholders at various levels, and undeniable economic implications. Scepticism surrounds both smart city initiatives and foreign aid, primarily due to a lack of clarity regarding their objectives and strategies. Fortunately, extensive discussions have taken place concerning the impact of aid, and the discourse on smart cities is gaining momentum. Given their similarities, it is crucial to reflect upon international development cooperation experience in guiding smart city project leaders. This paper represents an initial effort to address the concern of sceptics and demonstrate the significance of both smart city initiatives and foreign aid in economic development. Given the similarities, it is imperative to draw upon the wealth of experience in international development cooperation to provide guidance to smart city project leaders. This paper serves as an initial step towards addressing the concerns of sceptics and highlighting the significance of both smart city initiatives and foreign aid in fostering economic development.

This paper embarks on a pivotal mission: to demonstrate the significance of smart city initiatives within the context of development. It begins by establishing a connection between smart city initiatives and international development cooperation, emphasizing their shared values and potential risks. The subsequent section distinguishes between urban planning and smart city initiatives, addressing concerns raised by some stakeholders regarding the latter's inclusion as an academic discipline. Next, an introduction to Official Development Assistance (ODA) is provided, with a focus on concessional loans allocated to social and economic infrastructure sectors. The paper then delves into an in-depth examination of the relationship between smart city initiatives and international development cooperation, addressing key aspects such as governance, knowledge sharing, financing, and inclusiveness. Finally, it concludes by discussing the implications for the future.

### II. SMART CITY INITIATIVES AND INTERNATIONAL DEVELOPMENT COOPERATION

#### A. URBAN PLANNING AND SMART CITY INITIATIVES

The origins of modern urban planning can be tracked back to a social movement aimed at reforming disorderly industrial cities. City authorities have consistently pursued the ideal urban landscape, balancing social equity, economic growth, environmental sustainability, and aesthetic appeal. Urban challenges such as sanitation have persisted, but solutions have

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evolved alongside technological advancements, including the advent of the internet, mobile connectivity, and the rapid deployment of the Internet of Things (IoT).

Urbanization is expected to accelerate, with 68% of the global population projected to reside in urban areas by 2050. Development countries in Asia and Africa are poised to experience 90% of this growth, resulting in a surge of urban challenges encompassing congestion, slums, education, public health, employment, and environmental concerns. Cities are uniquely positioned to address many of these global urban problems, prompting a technological shift towards “Smart Cities.” These cities leverage technology and data resources to enhance urban planning and services, aiming to create smarter, greener, and more sustainable urban environments. Notably, citizen engagement has gained prominence, emphasizing technology as an enabler rather than a driver of innovation, ultimately improving urban quality of life and citizen welfare.

### ***B. International Development Cooperation***

Much like the Industrial Revolution led to rapid urbanization and necessitated improved city planning, the post-World War period called for the economic rehabilitation of European countries and their colonial territories. Official Development Assistance (ODA), a common form of post-war foreign aid, emerged as means to promote economic development and combat poverty. ODA, as defined by the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD), refers to assistance provided by official agencies with the objective of fostering economic development and well-being in developing countries. It encompasses financial and technical support directed towards the governments of developing nations or international organizations. ODA primarily aims to promote economic development and well-being as its primary objectives, excluding non-development or military purposes. Furthermore, ODA includes grants and subsidized loans, the latter constituting what is commonly referred to as concessional financing. Concessional financing implies a grant element of at least 25%, calculated at a 10% discount rate. This paper concentrates on “concessional loans” to align with the unit of analysis concerning smart city initiatives and concessional financing.

### ***C. The Interrelationship***

In this section, we explore the alignment between smart city initiatives and ODA projects. The aim is to demonstrate that smart city initiative processes bear significant resemblance to ODA projects, setting the stage for future implications. Table 1 outlines the unit of analysis, highlighting key actors, objectives, motivation, knowledge sharing, financing, inclusivity, and criticisms/risks. This overview underscores the robust alignment between smart city initiatives and ODA projects.

First, both smart city and ODA projects feature governing institutions as central players, with supplementary roles played by technology providers, international organizations, and academia. Second, smart city initiatives aim to enhance the efficiency and transparency of city management through data-driven planning whereas ODA projects focus on promoting economic development and welfare. However, the mutual emphasis on economic development provides a strong common ground. Third, both types of projects share a common ambition to pursue economic interests and sustainable outcomes. In this pursuit, knowledge sharing emerges as a vital tool, as smart city initiatives seek suitable technologies adapted to local contexts. For example, policy makers must identify appropriate technologies and attract technology suppliers to invest in their cities. Similarly, recognizing the importance of human and intellectual capital accumulation in economic development, the transition towards a knowledge-based economy has gained prominence. Consequently, knowledge-sharing initiatives between partner countries have flourished in the international development arena. The exchange of ideas and skills is recognized as critical to the success of projects, reinforcing the alignment between smart city initiatives and ODA projects.

As cities worldwide face rapid growth, often constrained by legacy infrastructure and limited budgets, they are increasingly forging partnerships with private and non-profit entities to advance their smart city agendas through Public-Private Partnerships (PPPs). This phenomenon is also evident in international development. In 2015, the United Nations (UN) introduced Post-2015 Sustainable Development Goals (SDGs), signifying a fundamental shift in the utilization of development finance. ODA is increasingly positioned to mobilize private finance for development (UN 2015, paragraph 41), with the private sector assuming a pivotal role in financing the post-2015 development agenda.

The narrative surrounding smart city projects underwent significant changes following the failures of various technology enterprise-led initiatives. It became evident that smart city initiatives should be government-led rather than company-led, with an emphasis on identifying and measuring the wants and needs of cities at the grassroots level. Consequently, citizen engagement gained prominence from the outset of smart city projects. Similarly, concerns regarding aid effectiveness surfaced in the early 2000s when the international aid community examined the aid effectiveness to ensure that resources mobilized from wealthier countries produced intended outcomes in poorer nations. Through numerous debates and discussions, the

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international aid community largely reached a consensus on the importance of ownership in enhancing the effectiveness of foreign aid. To achieve this, policies and project objectives required to be more inclusive.

Lastly, both smart city and ODA projects encounter similar concerns and criticisms. In the case of smart city projects, there are apprehensions about the formation of opaque partnerships between technology companies and city-level agencies, which give rise to privacy concerns, especially regarding the use of personal data. Furthermore, some critics express concerns about the uneven distribution of innovation, which may result in uneven development. They contend that many projects are short-sighted and fail to address real urban problems effectively. Similarly, in the realm of international development, lack of aid-receiving government leadership and accountability raised. These criticisms include accusations that aid has been dominated by corporate interests, leading to an unreasonable debt burden on developing countries. Additionally, some argue that aid has pressured countries to avoid using strategies that might protect their economies from the open market.

I. **TABLE The Alignment between Smart City and ODA**

	Smart City Initiatives	Official Development Assistance
Main Actors	Governments (Federal, Regional, Local), Enterprises (Tech suppliers), Academia, Developers	Government to Government (G2G), International Organizations (IOs), Non-Governmental Organizations (NGOs), Academia
Object	Improve efficiency and transparency of city management Induce economic development through deployment of data-driven planning	Promote economic development and welfare
Motivation	Economic interests, Environmental issues, Securing market dominance	Economic interests, national security, environmental issues, moral and humanitarian motives
Knowledge Sharing	Mixture of worlding and provincializing strategies	Knowledge sharing, Technical assistance
Financing	Government budget, Public-Private Partnership (PPP)	Concessional Loan, conditionality aid (tied-aid), ODA-PPP hybrid
Inclusiveness	Emphasis on Citizenship	Emphasis on Ownership and Inclusiveness
Criticism/Risks	Formation of opaque partnerships between technology companies and city-level agencies Privacy intrusion Increase of inequality Insensitivity to real urban problems	Use of foreign aid as a tool of influencing partner countries Increase of inequality Insensitivity to real local needs

The following section offers a detailed analysis of each argument. To facilitate the comparison between Smart City Initiatives and ODA projects, we have opted to dissect ODA projects and focus on those executed through concessional loans, particularly in infrastructure and education sectors.

### *j) Complexity of the governance, Objectives and Motivations:*

As previously discussed, smart cities are conceived with the overarching aim of enhancing equitable access to fundamental municipal services, encompassing education, healthcare, sanitation, and mobility. City administrators aspire to augment operational efficiency, managerial effectiveness, and citizen engagement in co-producing services through the adoption of diverse smart Information and Communication Technologies (ICTs), ultimately striving to elevate the quality of urban life. The conceptualization of smart cities initially received considerable acclaim for its potential transformative impact. Nevertheless, these laudable aspirations are often hindered by governance challenges, as noted by Ruhlandt (2018). These challenges are intricately linked to the complex urban landscapes characterized by a multitude of stakeholders, each wielding varying degrees of power and responsibility.

The framework of smart cities comprises a multi-tier architecture, generally categorized into five layers: the User layer, Service layer, Infrastructure layer, and Data layer (Bellini et al, 2011). The User layer encompasses all end-users of services and stakeholders within a smart city. Notably, this layer is positioned at both the pinnacle (encompassing the service planning group) and the base (comprising end-users) of the architectural hierarchy. This dual placement underscores the active participation of

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local stakeholders, who oversee, design, and implement services, in tandem with service consumers in the decision-making processes. The Service layer primarily consists of service providers, predominantly technology firms. Meanwhile, the Infrastructure layer constitutes the essential social and economic underpinnings, such as networks, information systems, and related facilities, that underwrite the deployment of smart services. Lastly, the Data layer encompasses the entirety of information and data that are requisites, products, and by-products of smart city operations.

The challenges inherent in smart city practices often stem from their strong orientation towards supply-centric, technocratic governance models (Marvin et al., 2015). This techno-centric approach sometimes leads to an imbalance among the layers, potentially diminishing the role and accountability of the User layer. Such imbalances can exacerbate concerns regarding opaque relationships between technology providers and local governments, thereby intensifying disputes related to data privacy. However, a significant shift in the narrative surrounding smart city projects became evident following the failures of initiatives spearheaded by various technology giants. This transformation led to a reassessment of smart city initiatives, underlining the necessity for government-led efforts, as opposed to being driven by technological companies. Furthermore, there is now a heightened emphasis on the generation of smart city initiatives from grassroots sources, aggregating and incorporating the voices of civic-minded individuals across the city.

This shift in approach bears striking similarities to the evolution of international development practices, which have also grappled with concerns regarding the effectiveness of foreign aid. The international development community has increasingly advocated for greater transparency in aid disbursement and heightened emphasis on the ownership and accountability of partner countries. Within the realm of Official Development Assistance (ODA) governance, a multitude of actors come into play, including international institutions, States, local authorities, private and non-profit development agencies, and financial institutions. The complexity of objectives and motivations among these diverse actors, coupled with the vast array of developmental issues, has laid fertile ground for discussions on aid effectiveness. Access to improved and comprehensive data on foreign aid, particularly from the mid-1990s onwards, has empowered scholars to examine aid impacts, often employing panel data methodologies. The incorporation of neoclassical growth theories has facilitated investigations into diminishing returns on aid investments. Researchers have explored diverse variables, including institutional quality, a facet referred to as 'the conditionality literature' by Stockemer et al. (2011). Notable studies, such as Burnside and Dollar (2000, 2004) and Collier and Dollar (2002), have posited that aid can be effective when recipient governments adhere to 'good' policies. This conclusion essentially underscores the pivotal role of institutions and aligns with the rhetoric emphasizing the significance of the User layer in guiding smart city initiatives.

In short, the commonalities between smart city initiatives and ODA projects are striking, not only in their shared objective of economic development but also in the multifaceted challenges posed by their intricate stakeholder landscapes and nuanced motivational dynamics. The concerted efforts to address these challenges have converged on a shared direction—the acknowledgment that governing institutions, as representatives of citizens, must assume greater responsibilities and initiative to facilitate meaningful progress.

### **ii) *Worlding and Provincializing versus Knowledge Sharing and Technical Assistance:***

It is paramount to recognize that each city and country possesses its unique development capacity, context, culture, history, and demographic makeup. However, a recurrent issue in the realm of development projects, be they smart city initiatives or ODA endeavors, is the tendency to view developmental experiences or technology-driven innovations as universally applicable solutions to the diverse array of development challenges faced by different cities and nations.

Smart city development and deployment have gradually come to terms with this reverse-directional predicament. There has been a swift consensus to address the historical, cultural, and specific urban issues that each city grapples with by actively seeking and cross-pollinating requisite and suitable technologies from across the globe. As aptly noted by A. Townsend, "Pieces of the ideal city of the future are popping up all over the place. We just need to find them and cross-pollinate them between cities, which is not always a simple cut-and-paste job. Rather, you have to extract those elements of technology, business model, and governance processes from the donor city that are re-usable, then graft them into the legacy systems in the recipient city." This perspective introduces the framework of *worlding* and *provincializing*, where *worlding* involves the development of strategies and technologies typically created in a global context, while *provincializing* entails adapting and contextualizing these development models to suit the unique conditions, cultures, and challenges of the specific location or "province" where they are to be implemented. Townsend's insightful remark encapsulates the *worlding* and *provincializing* approach, which can be effectively applied to Knowledge Sharing Programs within development initiatives. International development communities have recognized the absolute importance of transitioning toward a Knowledge-based Economy, leading to a demand for aid programs capable of facilitating this transformation and fostering economic growth. These programs have emphasized knowledge sharing

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and technical assistance, prioritizing a 'teach a man how to fish' over a 'give a man a fish' approach. However, owing to the distinct development backgrounds and needs of each country, understanding the contextual intricacies of each nation has emerged as the pivot for the success of such programs.

A tangible example of the provincialization of shared knowledge can be found in the case of the Fab Lab project in the Philippines. Sponsored by the Japan International Cooperation Agency (JICA) and supported by the Department of Trade and Industry-Bohol, Department of Science and Technology, and Bohol Island State University (BISU), this fabrication laboratory project was initiated to address the design requirements of approximately 135 manufacturers within Bohol's creative industry. The Fab Lab project responded to the challenge posed by Bohol manufacturers, who encountered difficulties in executing their designs as most processes were manual, relying on sketches that were then converted into product prototypes by hand. The project's objective was to implement a computer-based innovation, design, and fabrication workshop, allowing local manufacturers to create a wide range of products through open-source software, including 3D printing.

While the Fab Lab project in Bohol is categorized as ODA due to its support from JICA, it also falls under the umbrella of smart city projects. This dual classification arises from its aim to provide residents with free access to the internet and necessary technological resources as a stimulus for innovation. Ultimately, leveraging a country's or city's unique human capital, regional networks for knowledge sharing, mutual collaboration, and coordination among them constitute the cornerstone of the transition to a Knowledge-based Economy. This transformation essentially embodies a 'smarter' economy, aligning with the core objectives of smart city initiatives.

### **iii) *Financing: The Role of Public-Private-Partnership (PPP):***

In 2015, the United Nations (UN) introduced the Post-2015 Sustainable Development Goals (SDGs), marking a significant shift in the landscape of development finance. Paragraph 41 of the 2030 Agenda for Sustainable Development (UN 2015) underscores this shift and emphasizes the primary responsibility of each country for its own economic and social development. It also recognizes the essential means required for implementing the SDGs, including financial resources, capacity-building, and the transfer of environmentally sound technologies to developing countries under favourable terms, including concessional and preferential terms as mutually agreed. The role of both domestic and international public finance in providing essential services and catalysing other sources of finance is acknowledged, as is the role of the private sector, civil society organizations, and philanthropic organizations in achieving the new Agenda.

With this global commitment, the private sector assumed a central role in financing the post-2015 development agenda, aiming to increase returns on private sector investments through various financing instruments like blending and leveraging. This led to a proliferation in the direct use of Official Development Assistance (ODA) to support private flows. While proactively involving the private sector in development projects increased efficiency and enabled larger-scale initiatives, it came at a cost: a shift in perspective from viewing developing countries as partners in poverty alleviation and economic development to potential markets.

This shift in perspective, whether in the context of aid recipients or smart city project sites, is both understandable and fraught with risks. In the case of smart city projects, Public-Private Partnerships (PPPs) are often seen as inevitable instruments for financing these initiatives. Cities worldwide face the challenge of managing rapid growth while being constrained by legacy infrastructure and limited budgets. Local governments and citizens alike demand technologies to enhance municipal management and improve their quality of life. Private technology corporations are often the sole providers of the technologies required to meet these demands. Simultaneously, the unique characteristics of 'smart' technologies, which rely on the accumulation of data to expand and diversify services, make smart city approaches an attractive opportunity for technology corporations to advance their products and expand their market reach. However, this shared interest among multiple stakeholders can create inherent tensions and potential risks due to divergent motivations among these stakeholders.

### **vi) *Identifying Motivation through Citizen Engagement versus Ownership:***

The motivations driving technology corporations are clear: to capitalize on their technology and establish smart cities as their market. For local governments, the incentives to partner with these technology corporations is to enhance the efficiency of their municipal management systems, ultimately garnering more support from citizens and, consequently, more votes. However, this alignment of interests can expose smart city initiatives to the risk of fostering covert relationships between political and business circles. Ironically, while the objective of smart city projects is to enhance the welfare of citizens, the citizens themselves were initially largely overlooked in the early stages of smart city development across the globe.

Fortunately, significant shifts have occurred in the discourse surrounding smart cities. These changes were catalysed by the failures of various tech-corporations led smart city projects, leading to a collective realization that the conventional project



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processes were veering off course. It became evident that citizens and other stakeholders within the city must be actively engaged in the co-creation of solutions for smart cities to succeed.

A parallel evolution can be observed in the international development cooperation community. In the early 2000s, there were widespread questions about the effectiveness of aid, promoting the international aid community to engage in the process of reflection. Just as smart city projects bear the responsibility of using taxpayers' money wisely, the resources mobilized through taxes in wealthier countries entail a profound accountability to ensure the intended outcomes are realized in aid-receiving countries with fewer resources. After extensive debate and discussion, the international development community recognized the value of and began to emphasize recipient country's ownership in the development process. This shift aimed to establish a more balanced and mutually accountable relationship between donors and recipients, moving away from donor-centric, one-way development towards a model of development based on mutual and equitable accountability involving multiple stakeholders.

### **III. CONCLUSION**

In this paper, we have conducted an in-depth exploration of the interconnections between smart city initiatives and Official Development Assistance (ODA) projects, with a particular focus on aspects of governance, knowledge sharing, financing, and inclusiveness. Throughout this analysis, it has become evident that these two seemingly disparate realms share striking similarities in terms of their overarching objectives, inherent complexity, and diverse nature. However, these shared characteristics have also led to criticisms and scepticism regarding their underlying motives and their actual impact on economic growth.

As scholars committed to shedding light on these issues, it is paramount that we critically assess the reasons behind the disapproval and apprehension that often surround both smart city initiatives and international development cooperation projects. In this endeavour, we have sought inspiration from the extensive and varied experiences of the international development cooperation community. Their insights and lessons learned over time offer invaluable guidance in navigating the complexities and challenges that smart city projects encounter. For instance, smart city leaders can learn from the shift in international development cooperation towards greater government leadership. This shift ensures that smart city projects align with the need and priorities of local communities in the project planning and implementation stages. Moreover, citizen engagement should be a fundamental aspect of smart city initiatives. Drawing from the international development experience, smart city leaders should actively involve citizens from the grassroots level from the decision-making process. Governments should be proactive in keeping a balance between public (the citizens) and private (tech-implementing corporates) interests. International development projects emphasize the importance of knowledge sharing, which should be promoted by smart city leaders not only within their cities but also with other smart cities globally. Collaborative networks and partnerships can facilitate knowledge sharing and innovation. In addition, smart city leaders should adopt a long-term perspective, considering the sustainability of projects beyond their initial phases. International development experience underscores the need for development initiatives to have lasting impacts. Smart city leaders should plan for the scalability and sustainability of projects to ensure continued benefits for citizens.

While this paper modestly contributes to the understanding of the objectives and implications of smart city agendas, it also serves as a timely reminder against diminish partner cities or countries as mere potential markets. By incorporating these policy implications, smart city leaders can navigate the complexities of urban development, enhance project outcomes, and ensure that smart cities are inclusive, responsive, and beneficial to all residents.

### **ACKNOWLEDGMENT**

This research was supported by the BK21 FOUR (Fostering Outstanding Universities for Research) funded by the Ministry of Education (MOE, Korea) and National Research Foundation of Korea(NRF).

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