

Governance Challenges for Building Smart Green Cities: From a Multi-Level Governance Perspective*

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Abstract

As cities become vulnerable to climate change and benefit from technological advances, the construction of sustainable and environmentally friendly cities has drawn the attention of policymakers, experts, and academia. Nevertheless, very few attempts have been made to develop cities by focusing on governance. This study examines the governance challenges faced and the policy implications for developing a Smart Green City (SGC) policy in Korea, focusing on the institutionalization of the 2020 SGC project. This study adopts a multilevel governance perspective to explore the limiting factors that take place in creating SGC by examining its vertical and horizontal governance frameworks. First, it identifies the multilevel governance challenges in building an SGC where stakeholders express conflicting interests. Second, it concludes that SGC governance is a matter of politics because urban environmental policies employ multilevel parties in which negotiating and compromising are inevitable among stakeholders. Finally, the study proposes a well-organized communication channel inviting embedded stakeholders for the success of the SGC project.

Key Words ; Smart Green City, multi-level governance, limiting factors, policy implication

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I. Introduction

Cities can be drivers and platforms for innovation, which is essential to sustainable urban development (Yun, 2016). According to the United Nations (UN) report on urbanization prospects, 55% of the world population is currently living in urban areas, and this percentage is expected to increase to 68% by 2050. The urban population has grown from 751 million in 1950 to 4.2 billion in 2018 and is projected to reach 6.7 billion in 2050 (United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP], 2019). As such, pressure and opportunity for change lie in the urban environment (Asia-Pacific Economic Cooperation [APEC], 2018).

Against the backdrop of global urbanization trends, Korea is focusing on city sustainability (Jung, 2020). The Korean government introduced the Smart Green City (SGC) as a flagship initiative under its Green New Deal. The SGC aims to integrate digital solutions with eco-friendly practices to address climate change (Korea Environment Institute [KEI], 2020). While the rise of international and domestic eco-cities has attracted scholarly attention—especially regarding the design, financing, and lifestyle of residents—insufficient attention has been paid to how these cities are governed by actors at different administrative levels and from different political boundaries. This is an important knowledge gap as governance processes are critical for the implementation of eco-city projects (Bulkeley & Marvin, 2014).

SGC policy also faces challenges in situating complex relations and various stakeholders in the context of domestic politics. These challenges have given rise to both national actions to create the policy and legal frameworks based around urban issues and the environment. Therefore, building SGC is beyond the capacity of a single government agency. This does not necessarily signal a weakening of national governance over the urban environment; however, it is a clear break from the hegemonic, government-centric system. Urban environments are places where stakeholders express their contest interest and competing arguments despite the shared goal of SGC. Accordingly, multiple layers of government and social forces do not mean that cooperation is smooth or that co-organization ensures a convergence of priorities. On the contrary, action systems over these multilevel issues tend to reflect complex and conflicting interests rather than stable cooperation processes.

Although several studies have been conducted on the smart city, little attention has been paid to governance in building smart cities. Therefore, this article explores where and how multilevel interactions arise to build SGC policy, in which issues create political conflict and lead to related consequences on urban environment policy governance. For instance, the smart city is organized by the Ministry of Land, Infrastructure, and Transport, and the SGC is organized by the Ministry of Environment (ME). Although they have a common goal of “Sustainable urban development using in-

formation and communication technologies (ICTs) and improving quality of life,”the plans and promotion are being conducted separately. This lack of comprehensive governance can cause problems such as a lack of integrated policies, redundancy between departments, and bureaucracy over investment and inefficiency.

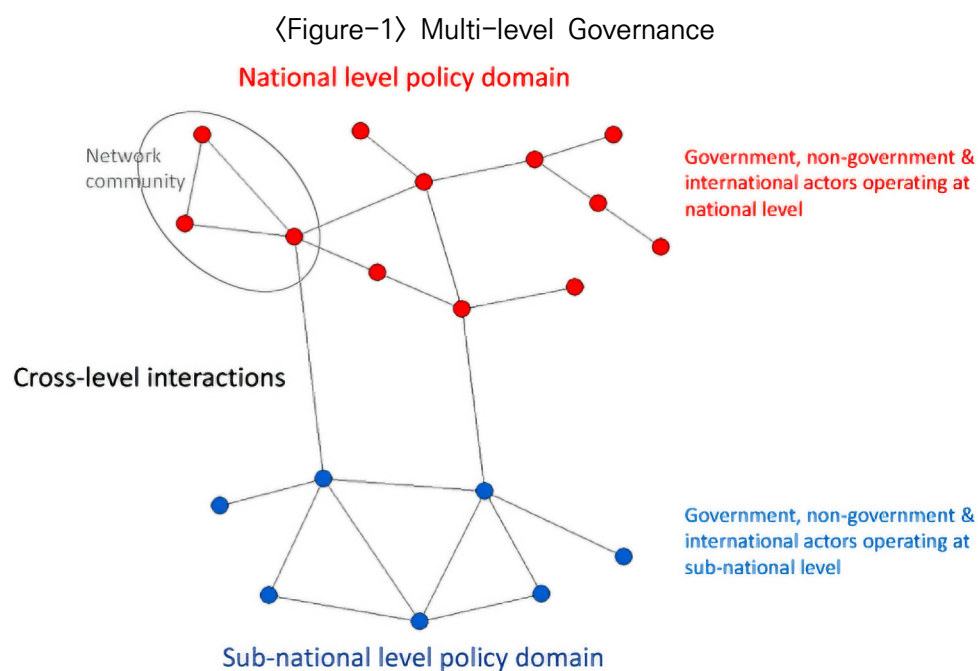
This article delves deep into multilayered governance interactions that shape SGC policy and identifies areas of political contention. Analyzing both the horizontal and vertical governance perspectives, it highlights the limitations posed by a lack of cohesive governance. It concludes by offering insights into multilevel urban environmental governance and proposing future directions.

II. Theoretical Background

2.1 Multilevel Governance

Gary Marks (1996) first used the phrase “multilevel governance” to capture developments in the European Union’s (EU) structural policy following its major reform in 1988. In an early article on the subject, Marks defines multilevel governance as “a system of continuous negotiation among nested governments at several territorial tiers.” In developing this definition, he draws on an analysis of domestic politics—specifically the policy networks approach—in describing how, within multilevel governance, “supranational, national, regional, and local governments are enmeshed in territorially overarching policy networks” (Hooghe & Marks, 1993). Further, Jessop (2004) suggests that the key issue for a research agenda in this new form of statehood becomes the manner and extent to which the multiplying levels, arenas, and regimes of politics, policymaking, and policy implementation can be endowed with a certain apparatus and operational unity horizontally and vertically, and how this affects the overall operation of politics and the legitimacy of the new political arrangements. Di Gregorio et al. (2019) conceptualizes an approach to multi-level policy networks that emphasizes interactions both within and across levels of governance. This perspective encompasses both the national and subnational domains of climate and land use policy, highlighting the roles of governmental, nongovernmental, and international actors operating within their respective jurisdictional levels <Figure-1>.

An emerging group of scholars has begun to position the problem of local government sustainability action within a system of multilevel governance (Bulkeley 2010; Bulkeley & Betsill 2005; Corburn 2009). In this framework, state and federal governments may use incentives or regulations to establish broad goals and provide technical or fiscal capacity for local action. Thus, in this coproduction approach, knowledge and policy innovation flow up from local governments, down from higher authorities, and horizontally across networks of municipalities (Homsy & Warner 2013).



Source: Di Gregorio et al. (2019)

2.2 Literature Review

Numerous studies have asserted the significance of multilevel governance in regional development. Underdal (2010) insists that successful cooperation between central and local government fosters the diffusion of best practices and enhances collective action across scales. Additionally, Newig and Fritsch (2009) discovered that, while the inclusion of various actors and levels in the decision-making process can enhance environmental outputs, the specific context and environmental preferences of actors play a pivotal role in determining outcomes. Lee (2018a) insists that collaboration among cities is sometimes described as dispersed collaboration. Dispersed collaboration policy refers to the collaboration between government personnel, nongovernmental organizations, community-based organizations, and private performers based on partnerships between them. Cooperation among cities is more frequent through dispersed collaboration as they share their experiences to supplement the top-down operating programs. Lee and Ha (2016) suggest transitioning to a “platform government” to incorporate dynamic innovations from the private sectors innovation ecosystem into the public domain to address policy issues. Yu and Yun (2015) insist that it is important to identify who is participating and how the decision-making process in climate change governance works. The partnership between the government and private sector and that between governments are essential for governance to adapt to climate change.

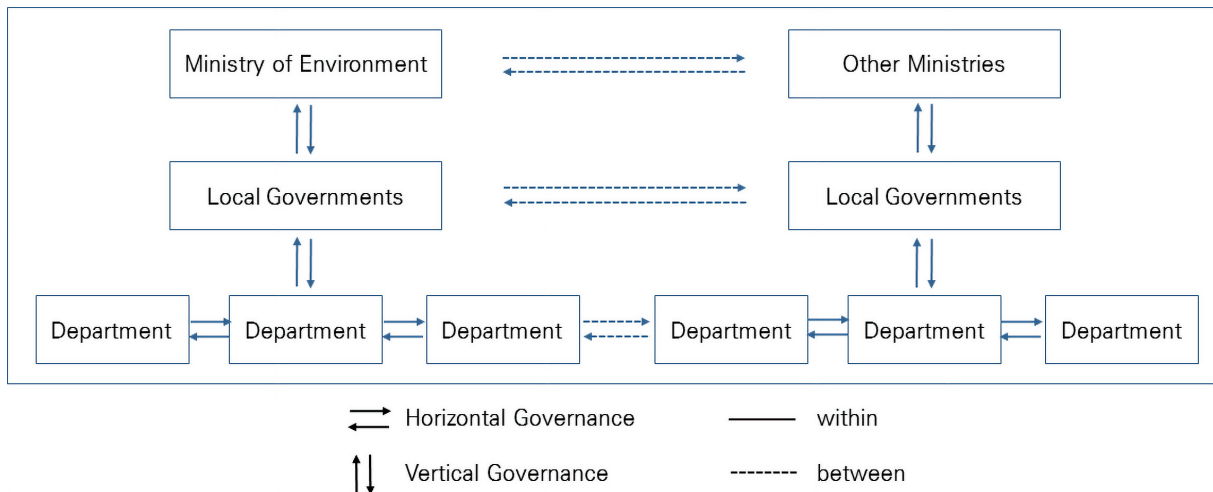
Previous studies have criticized the lack of governance in the Republic of Korea and have proposed alternative solutions for the establishment of governance. Open-minded communication, interactions, trust building, and information sharing have been proposed from the participants’ standpoint. From an admin-

istrative standpoint, negotiation processes, negotiation bodies, fair rules and policy, and democratic systems have been proposed. However, no sufficiently detailed consideration has been given to interactions, trust-building, and information-sharing plans in actual project operations. In particular, no sufficient analysis has been conducted on the SGC project from a governance standpoint, as well as on the main reason that governance could not be systematically in place under social, cultural, and political situations.

2.3 Analysis Framework

Mark’s (1993) study of multi-level governance was incorporated into our analytical framework, which was tailored to accommodate the specific constraints inherent in the planning and implementation of the SGC project. Through a thorough examination of the SGC project’s background, this research elucidates the roles of both central and local governments and further segments operative governance into horizontal and vertical dimensions, as shown in <Figure-2>. Subsequently, policy implications are gleaned from case studies of successful governance models in other countries at the policy level to inform our SGC implementation strategies.

<Figure-2> Analytical Framework



III. Research Case and Methodology

3.1 Policy History

Starting with the introduction of an urban information system that applies information and communication technology to urban spaces in the mid-1990s, Korea has attempted to develop smart cities through the ubiquitous-city (U-city). With the emergence of digital cities worldwide in 1994, Korea’s

urban information system was leading other countries. The start of a smart city is the U-City under the Act on the Construction of Ubiquitous City, which was enacted in 2008 (Ministry of Land, Infrastructure and Transport [MOLIT], 2013). However, several issues have been raised, including the lack of clear goals and visions, restrictions on funding for new city development, and the lack of participation of residents and private enterprises (Lee, 2018b).

With the suspension of large-scale urban development projects in 2014, the U-city developed into a project to discover new services and build an urban integration platform by linking CCTV, sensors, traffic, and crime prevention systems. In 2017, the Act on the Promotion of Smart City Development and Industry was enacted to present people-centered, sensible, and sustainable cities as the core values of smart cities, away from existing technology-oriented urban development and management approaches (MOLIT, 2020). However, despite the declarative aim of city sustainability, most smart city projects are still focused on the application of high technologies, raising issues such as effectiveness compared to capital inputs. Although the level of technology is higher than that of other countries, eco-friendly and sustainability are relatively overlooked as related policies and projects are focused on technology (Ahn, 2018; Jung 2019).

In conjunction with this circumstance, the Korean Government presented the Korean New Deal Plan in 2020, which integrates Digital New Deal and Green New Deal with the goal of net-zero (Ministry of Economy and Finance [MOEF], 2020). Yun (2021) defines the green new deal as a social agreement to restore the economy and transform the country into a green country by eliminating negative effects on the environment—especially by reducing carbon emission, which is the major cause of the climate crisis. The SGC project is at the Green New Deal level and will strengthen the environment and secure sustainability.

3.2 Smart Green City Project

Many cities and regions worldwide are making efforts to respond to climate changes and environmental issues in urbanization. The Korean Government also stated that it will aggressively take actions to move forward to the goal of net-zero in 2050, and local governments established practicing committees for net-zero, addressing the climate crisis in 2020. The Korean Government placed green energy transition, eco-friendly urbanization, and SGC construction as top priorities and the core elements of the Korean New Deal Project. The SGC project planning took their pending issues, weaknesses, and uniqueness into consideration and attempted modeling by integrating four different areas and 10 different categories, as listed in <Table 1> (ME, 2020).

〈Table-1〉 Planning Model of SGC

Area	Resilience			Low Emission		Ecological Restoration		Human-centered Approach		
Objective	Environment improvement project to empower restoration and respond to climate environment changes caused by climate changes			Life patterns of emission reduction to reduce greenhouse gas (supporting infrastructures such as transportation, circulation of resources)		Conservation of natural environment and the approach, types of projects for conservation, and restoration of ecosystem		Types of education-based programs and facilities to secure self-directed environment management and environment rights		
Example	Water management Green infrastructure Greenhouse gas reduction			Resource circulation Eco-friendly car		Restoration of ecosystem Ecotourism		Environment Education Smart clean city		
Categories	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
	climate resilience	hydrologic cycle	water safety	autonomous vehicle	resource circulation	restoration of ecosystem	resting ecosystem	clean air	environment education	living - environment

Source: Ministry of Environment (2020)

The SGC project is led by the ME, and 25 cities have been chosen to establish a solution model and comprehensive model. The solution model consists of a combination of more than two project categories, and it is intended to improve and solve the climate and environment issues taking place in the city. The 20 cities chosen for this model will be supported with about 10 million USD for 2 years. The comprehensive model consists of a combination of more than three project categories and is intended to improve and solve the climate and environmental issues that occur in regions larger than city-unit communities. In this model study, five cities were chosen by their influencing novelty and relevance to the solution model, and they will be supported with about 15 million USD for 2 years (ME, 2020).

For the 2020 SGC project, 100 of 243 local governments applied for public smart green project grants at an unprecedented competitive rate of 4:1, which implies that many local governments are interested in SGC projects. They presented various SGC models, of which 25 (5 comprehensive models and 20 solution models) cities¹⁾ were selected.

The ME expects 3,000 new jobs and a greenhouse gas reduction of 27,000 tons/year. For the central government, the background motivations for the SGC project through the Green New Deal were national economic growth, greenhouse gas reduction, and the elimination of social inequality. In addition, local governments were motivated by securing the budget, growing the local economy, and creating new employment.

1) The solution model has been selected in 20 places, including 6 locations in Gyeonggi-do (Bucheon-si, Seongnam-si, Anseong-si, Anyang-si, Yangju-si, Pyeongtaek-si), 3 locations in Jeollanam-do (Suncheon-si, Jangheung-gun, Haenam-gun), 2 locations in Gangwon-do (jointly by 6 local authorities in Gangwon-do, Gangneung-si), and 1 location each in Chungcheongbuk-do (Jincheon-gun), Chungcheongnam-do (Gongju-si), Jeollabuk-do (Jangsu-gun), Gyeongsangbuk-do (Pohang-si), Gyeongsangnam-do (Miryang-si), Incheon (Seo-gu), Gwangju (Dong-gu), Busan (Saha-gu), and Jeju. The comprehensive model has been selected in 5 places: Gyeonggi-do (Hwaseong-si), Jeollabuk-do (Jeonju-si), Jeollanam-do (Gangjin-gun), Gyeongsangbuk-do (Sangju-si), and Gyeongsangnam-do (Gimhae-si).

3.3 Methodology

In this study, a literature review was conducted, as well as in-depth interviews where the literature review could not cover the aim of the study. The research approach is based on reviewing the existing theoretical studies and precedent research data. The major referencing material included research articles, proposals, and reports published by central and local governments. The primary subjects of the investigation were key stakeholders directly involved in project implementation, including officials in charge of smart and smart green cities at the central and local governments. In this regard, semi-structured interviews were conducted to reinforce the advantage and supplement the disadvantage of unstructured interviews. In this process, the main frame followed a structured format; however, depending on the circumstances, the interviewer subjectively managed supplemental topics. The interviewer standardized the content in the interview and added supplemental questions to retrieve more detailed information from the interviewee. Interviews were conducted intermittently from 02/16/2021 to 04/06/2021. Since no changes in policies or incidents impacted the interviews' content, no data from the interviews would be affected and biased by historical effects. The contents of the interviews were "persistence of smart city and SGC," "organization of stakeholder group and consultation process in planning," and "administrative tasks for persisting SGC." In-depth interviews were conducted on a one-on-one basis. <Table-2> shows an outline of the interview survey.

<Table-2> List of interviewees

ID	Affiliation	Interviewee	Date (yy.mm.dd)	Duration (min)
A	Korea Environment Institute (mainly funded by Ministry of Environment)	Senior Research Fellow	21.03.06	40
B	National Information Society Agency (mainly funded by Ministry of Science and ICT)	Research Fellow	21.02.16	90
C	Korea Research Institute for Human Settlements (mainly funded by Ministry of Land, Infrastructure and Transport)	Research Fellow	21.04.06	60
D	Ministry of Environment	Deputy Director	21.04.06	70
E	Seongnam-si	Team manager	21.02.17	60
F	Anyang-si	Team manager	21.03.15	60
G	Pyeongtaek-si	Manager	21.04.05	50
H	Jincheon-gun	Manager	21.04.05	60

IV. Analysis of limiting factors

4.1 Horizontal Governance

4.1.1 Side effect of bureaucracy in the policy making

From the insights gleaned from these interviews, several limitations and challenges stemming from bureaucratic structures in policymaking emerge. Different government departments appear to share a pervasive sentiment of territoriality, often leading to friction and reluctance to collaborate. <Table-3> summarizes the projects related to Smart and Green for which each Ministry is responsible.

<Table-3> Projects related to Smart and Green by ministries

Ministry	Project related to Smart	Project related to Green
Ministry of Science and ICT	<ul style="list-style-type: none"> • 5G • Smart village • Instruction of smart city 	-
Ministry of the Interior and Safety	<ul style="list-style-type: none"> • Instruction of smart town with ICT • CCTV control center 	-
Ministry of Agriculture, Food and Rural Affairs	<ul style="list-style-type: none"> • Smart farm 	-
Ministry of Trade, Industry and Energy	<ul style="list-style-type: none"> • Smart industry • Industrial Standardization of smart city 	<ul style="list-style-type: none"> • Renewable energy supply (solar heat, solar farm, geothermal heat) • Ecological industry
Ministry of Environment	-	<ul style="list-style-type: none"> • Smart green city • Eco recycling center
Ministry of Land, Infrastructure, and Transport	<ul style="list-style-type: none"> • Smart City test bed • Smart challenge project • New deal urban regeneration project 	<ul style="list-style-type: none"> • Green remodeling • Zero energy building

Source: Compiled by the author based on various government department documents.

Interviews have shown that this situation leads to a power struggle between central government departments.

The Ministry of Environment (ME) embraced the Smart Green City project as part of a Green New Deal initiative. However, the Ministry of Land, Infrastructure, and Transport (MOLIT) expressed reservations, viewing the concept of smart city as their domain. They were hesitant to merge it with environmental aspects. In an ideal scenario, MOLIT would provide input from the smart city perspective, while ME would contribute insights on the green city aspect. However, this idealistic cooperation seems challenging in practice. Many government employees prioritize legal bases when defin-

ing their roles. It is crucial for higher-level management to develop a collaborative framework that allows all relevant departments to effectively contribute in areas such as land, energy, technology, and environment.

These difficulties were revealed through interviews with SGC experts and local government practitioners. Most of the difficulties in planning project items were due to separate legislation and policies by separate departments.

In the project plan, I referenced the term “zero energy building.” However, I couldn’t use this terminology during field evaluations or PPT presentations. The ME aimed to promote projects that both created jobs and reduced greenhouse gas emissions. However, finding new project items is challenging, especially when other initiatives, which overlap with different departments, are excluded. These include green remodeling, solar energy, green belts, and community support programs. As a result, I had to refer to green remodeling as building remodeling project.

In summary, these interviews underscore the pronounced side effects of bureaucracy in policy-making, marked by territoriality, budgetary restrictions, and a lack of interdepartmental collaboration, which often stymies comprehensive and holistic policy development and implementation.

4.1.2 Overloaded work for the local government practitioners

The interviews highlight the multifaceted challenges faced by local government practitioners, which are primarily centered around the theme of an overwhelming workload. Additionally, labor force shortages and the reluctance of other departments to proactively participate in projects further exacerbate the workload for specific divisions.

We are short on labor force and do not have the ideal conditions to consistently execute projects. Even though other departments are involved, their participation is passive rather than proactive. It feels like there is a wall between us. Perhaps if a performance-based promotion system were implemented, these departments might be more engaged. As it stands, one department ends up shouldering all the responsibilities. This situation directly affects the citizens negatively. Introducing bonus points in the performance review by the ME for collaboration during the project recruitment process might motivate more active participation.

Furthermore, although multidepartment involvement can optimize specialized labor force and distribute risk, it is crucial that projects do not become an additional burden for these departments. Some respondents indicated that the central government should provide criteria to distribute specific budgets

and performance from the project's public offering stage to establish a solid cooperative system.

Ensuring equitable distribution of budget and performance evaluation is crucial. Even with a lead department, a robust organizational structure is required to manage participants from diverse departments. Initially, local governments should plan task distribution, anticipate needed labor force, and allocate budgets effectively. The primary department should not monopolize the entire budget and achievement; instead, there should be a system where budgets are fairly dispersed, and the performance of all participating departments is evaluated and rewarded justly. Following this, both local and central government leaders should conduct evaluations and give approvals.

4.1.3 Lack of inter-city network for sharing experiences

The interviews underscore a pressing concern related to the scarcity of established inter-city networks for sharing experiences on projects such as the SGC. Several practitioners expressed a keen desire for their projects to serve as reference models for other cities, emphasizing the value of iterative improvement as cities adapt and learn from each other.

I am actively involved in the ongoing SGC project, aiming to create a model that can serve as a reference for other cities. I also hope that as this model is adopted by other cities, it will continue to evolve, especially given how effective smart technology has proven to be in our city.

However, an inter-city network for sharing experiences is lacking. Some cities proactively seek out others with analogous projects or success narratives to glean insights and indirectly learn from their challenges and solutions, but most cities encounter informational constraints because of the absence of a formalized platform or network for such exchanges.

This is a first for us as well, and we are not entirely confident. Therefore, we visit other cities with similar ongoing projects or success stories. This allows us to indirectly learn from the trials and errors of other local governments. We also create opportunities for all involved practitioners to visit these cities and share their insights.

Hence, it is necessary to establish a shared open platform that ensures equitable access to information and experiences, bridges gaps, and fosters a collaborative spirit in the development of SGC projects.

4.2 Vertical Governance

4.2.1 Constraints on implementing local needs

The interviews reveal the clear challenges that local governments face in implementing projects tailored to their unique needs. Despite decentralization efforts since the mid-1990s, the central government's influence has remained prominent, leading to a mismatch between local project aspirations and actual implementation.

We made proactive efforts to create a zero-carbon park using renewable energy. We explored the use of vertical gardens and green walls, aiming to educate the school-age population in the area. While our proposal contained numerous ideas about renewable energy, many were not approved during the evaluation process.

Although local governments take the lead in conceptualizing SGC projects, the directives and overarching implementation often come from the central government. This centralized control sometimes results in the truncation of local initiatives that are seen as redundant or overlapping, which highlights the trust gap between the two governance levels. To better address local needs, a governance shift from the current top-down model to a more inclusive bottom-up approach is needed; this would entail the central government continuously evaluating and financially supporting the initiatives proposed by local governments, ensuring a more aligned and effective implementation of local projects.

4.2.2 Lack of connectivity with basic plans

The collected insights foreground a critical concern regarding the misalignment and lack of coherence between foundational urban development strategies and emerging initiatives such as the SGC project.

Project implementation is at the foundational level, while planning and policymaking are at more elevated levels. Due to this vertical structure, successful integration and collaboration among projects can only occur with effective coordination from higher-level management.

Such discrepancies often stem from the fragmented project recruitment across central government departments. Initiatives such as the Integrated Management of Land and Environment have been actively debated since 2013, with several frameworks emerging to address these concerns. However, a critical observation drawn from local governments suggests a glaring disconnect between smart city projects and SGC initiatives. Lee and Lim (2016) critique the present governance structure, indicating

that despite the central government's stewardship in orchestrating smart city projects, established administrative governance exhibits suboptimal performance. The hierarchical structure of governance often restricts integration and collaboration between projects unless meticulously coordinated by the upper echelons of management.

4.2.3 The gap between budget process

Navigating SGC projects is particularly challenging due to the misalignment between national and local budget processes. While these projects benefit from a 60% national and 40% local funding structure, the journey from project inception to budget allocation is replete with administrative roadblocks. Local entities grapple with the dual challenges of a process for project initiation, followed by another process dedicated to feasibility assessments. This temporal compression often misaligns with the rhythms of local budgeting schedules, exacerbating uncertainties in the context of national budget usage.

Since our city's budget is separate from project recruitment, we prioritize supporting related projects. I have heard about challenges faced by other local governments in aligning their budgets with existing projects due to their haphazard recruitment processes. The ME is urging for the rapid progression of projects once they are budgeted, but the many procedural steps make it hard to spend the funds efficiently. Realistically, it is not feasible to expend 10 million USD in just two years.

The vision for these projects is clear, but their implementation is often ensnared in the labyrinth of administrative and legal protocols. Due to these circumstances, local practitioners grapple with complex approval processes and budgetary hurdles, often resulting in halted initiatives despite having secured budget approval. As custodian of the SGC project, the central government needs to advocate the establishment of an integrated and efficient budgetary framework. This refined structure aims to bridge the existing gaps, ensuring timely and effective budget deployment for the realization of SGC objectives.

V. Discussion and Conclusion

In this study, we analyzed the interactions of multilayered governance using the Smart Green City project. A summary of the analysis is as follows.

The following limitations should be noted with respect to horizontal governance. First, although different ministries have established their own projects, legislation, and policies related to green ini-

tiatives, this approach has some limitations. Achieving the ultimate goals of SGC projects, such as efficient greenhouse gas reduction and green transformation, is challenging when overlapping projects from different departments are excluded. Second, collaboration and participation among the relevant departments are insufficient. While local governments in their developmental stages assemble task force teams from various departments, the responsibility for planning, operation, and management predominantly falls on the primary department that oversees the projects. In addition, the lack of a structured system to foster collaboration and assess the performance of the practitioners involved is noticeable. Third, the current SGC project follows a basic business model focused on infrastructure construction funded by the central government. A systemic gap exists in information-sharing and collaboration among cities and communities. To address this issue, there is an urgent need to develop a unified business model within an SGC network. This would enable both the central and local governments to actively participate, facilitating the sharing of concepts, standards, and directions derived from collective knowledge and experiences.

The following limitations should be noted with respect to vertical governance. First, local governments drive SGC project ideas, but implementation is often directed by the central government, leading to a trust gap and the potential truncation of local efforts. To bridge this gap, a push has been made for a shift from top-down governance to a bottom-up approach, in which the central government supports and aligns with local initiatives. Second, fragmented project recruitment across central government departments has led to discrepancies in project alignment, with local governments noting a disconnect between the smart city and SGC initiatives. Despite the central government's leadership in smart city projects, the current governance structure hampers integration and requires meticulous coordination by top management. Third, the SGC project does not have sufficient systems to support the local governments in efficiently executing the budget. To minimize the gap, the central government needs to provide written promises to grant local matching and national funds in advance before the supplemental budget has been allocated.

Thus, a legislative basis must be established for sustainable SGC construction. However, it has to be taken into deep consideration whether to apply the existing Climate Crisis Act and Green Transition Law or to legislate separately. In addition, it is necessary to set up integrated systems to manage scattered systems. Furthermore, the scope of the existing integrated management model of the land - environment plan needs to be expanded, and its effectiveness should be maximized to establish an integrated long-term SGC construction plan. The current comprehensive land-environment management model system, which is limited to land development plans and comprehensive environment plans, needs to be expanded to embrace the smart city and SGC projects so that it can be used as a common basis on which central and local governments can develop an integrated long-term plan. The effective-

ness of a given system can be maximized when it coincides with people's interest and agreements. Therefore, the government must continue communicating and sharing ideas with all relevant groups of people for a better understanding of the system. This would be the way in which an administrative system could achieve effectiveness for SGC and support from the people.

This study has important implications for academia and policymakers. First, academically, the historical changes of urbanism have been observed to draw out the current concept of SGC. In other words, it may be worth observing the theoretical background of both domestic and foreign governance system on SGC and learned lessons in Korea. Second, from a policy perspective, a practical direction is suggested based on an analysis of the current legal systems to successfully drive SGC policies to be properly executed at the present initial stage. It is postulated that a reference manual has been provided to the policy executor by proposing a stepwise SGC operating system while considering the uniqueness of the recruited smart green city projects. However, comprehensive formation of the central and local governance with participation of citizens and enterprises was not studied in depth at this time since the focus was on the interactive governance among government bodies for the central and local governments.

Further directions of the SGC will provide more evidence to support this research. In particular, as the nature and concept of the smart green city have evolved, follow-up research may be conducted in terms of policy, governance, environmental, and technological approaches.

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스마트 그린 도시 조성을 위한 거버넌스의 과제 : 다층적 거버넌스 관점에서*

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초 록

기후위기가 심각해지면서 적응이 갈수록 중요해지고 있다. 특히 도시가 기후변화에 취약해짐과 동시에 기술 발전에 따른 혜택이 집중되면서 지속가능하고 환경친화적인 도시건설에 대한 정책입안자, 전문가 그리고 학계의 주목을 받고 있다. 그럼에도 불구하고, 스마트그린도시의 구축과 지속가능한 도시개발을 가로막거나 힘들게 하는 장애요소에 대한 논의는 부족한 실정이다. 이 연구에서는 2020 그린뉴딜 사업으로 지정된 스마트그린도시 정책을 수립하고 이행하는데 있어서 마주하는 한계 요인을 살펴보았다. 본 연구는 문헌연구와 스마트그린도시 사업에 참여한 정책입안자, 실무자, 전문가, 학계의 비구조화 심층면접을 통해 진행하였다. 선행연구 검토를 통해 한계 요인을 크게 ‘수평적거버넌스’와 ‘수직적거버넌스’로 나누어 살펴본 결과, 유사정책의 상충, 통합관리 제도의 부재, 성과주의 등의 요인을 발견할 수 있었다. 기후위기에 대한 지역단위의 적응 역량을 구축하고 강화해나가기 위해서는 이 연구에서 발견한 한계 요인들을 지속적으로 보완해 나가야 할 것이다. 다양한 이해관계자 간의 소통을 통해 스마트그린도시를 만들어 가는 과정에서 정부의 일관성 있는 정책과 더불어, 지방정부, 기업, 시민사회 등의 활발한 참여가 요구된다.

주제어 ; 그린뉴딜, 스마트그린도시, 다층적거버넌스, 한계요인

* “이 논문은 제1저자 이서영의 석사 학위논문의 축약본임”

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“이 논문은(또는 교재는) 국토교통부의 스마트시티 혁신인재육성사업으로 지원되었습니다.”