land

MDPI

Article

History of Seoul's Parks and Green Space Policies: Focusing on Policy Changes in Urban Development

Jeonghee Choi and Gunwoo Kim *

Graduate School of Urban Studies, Hanyang University, 222 Wangsimni-ro, Seongdong-gu, Seoul 04763, Korea; cjh1128@seocho.go.kr

* Correspondence: gwkim1@hanyang.ac.kr; Tel.: +82-2-2220-0274

Abstract: Globally, urban areas have been expanding rapidly since industrialization. In South Korea, urban policy has evolved according to urban development, but the change in parks and green spaces policy for a pleasant urban environment is insignificant. The purpose of this study is to present the direction of the Seoul Metropolitan Government's parks and green spaces policy in terms of green infrastructure, by examining urban policies and changes in the parks and green spaces policy of the Seoul Metropolitan Government. The research method established the concepts of urbanization, green park areas, and green infrastructure, focusing on a literature review. The trends in urban development in South Korea and abroad, the correlation between urban development and green park areas, and changes in the parks and green spaces policy of Seoul are examined. The study found that urbanization in South Korea has augmented since 1960, and the parks and green spaces policy has also focused on quantitative expansion. As the era of local autonomy passed, there were remarkable policy changes tailored to citizens' needs, and major policy directions were determined according to the political inclinations of policymakers. The era of low growth adopted the policy of introducing green park areas as green infrastructure to solve urban environmental problems, and parks and green spaces policies as strategic plans to re-naturalize smart green cities and urban infrastructure, and to increase urban resilience using advanced technology. Future research is expected regarding consistent policy implementation measures linked to the state-regions, such as analyzing citizens' perceptions of policies to solve urban problems and taking practical measures for the implementation of parks and green spaces policies to expand green infrastructure. The implication of the study is that the green infrastructure strategy is important as a solution to urban environmental issues such as climate change. Therefore, there should be a will of policymakers and strong institutional support for continuous policy promotion.

Keywords: urban policy; urban environmental policy issues; green infrastructure; urban policy paradigm

check for updates

Citation: Choi, J.; Kim, G. History of Seoul's Parks and Green Space Policies: Focusing on Policy Changes in Urban Development. *Land* **2022**, *11*, 474. https://doi.org/10.3390/land11040474

Academic Editors: Thomas Panagopoulos and Sarel Cilliers

Received: 11 January 2022
Accepted: 23 March 2022
Published: 25 March 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

1.1. The Background of the Study

Globally, urban areas have been expanding and undergoing rapid development, and urban policies have been rapidly changing according to the quantitative expansion of cities, population concentration, and the demands of urban residents [1]. In particular, Seoul, Republic of Korea, underwent industrialization and transformed into an information society after 1962. Currently, as an advanced information technology (IT) city, the pace of urban change in Seoul is incomparable to that of other large cities. Korea's active parks and green space policies, introduced in the era of local autonomy in 1993, have also evolved in concurrence with urban development [2]. However, since the park and green space policy was recognized as an ancillary plan of urban planning, there were numerous plans that considered only developing parks and green spaces in terms of quantity. Since the 1992 Rio de Janeiro Earth Summit, focus on environmental issues, such as biodiversity,

sustainable development, and climate change, has increased. Improving urban ecosystem services such as parks, landscapes, and communities can bring about many socioeconomic benefits, which can also contribute to enhancing the quality of life for urban residents and green infrastructure policies [3]. Accordingly, the parks and green space policies have also developed from a quantitative aspect to a qualitative aspect, in line with the paradigm change.

In Seoul, there has been a high demand for parks and green spaces from urban residents, to solve urban environmental issues, such as fine dust, urban flooding, and heatwaves, but the actual effects of these spaces have been insignificant [4]. There are several problems, such as the impervious surfaces in most areas of Seoul hindering rainwater management and numerous diesel vehicles generating fine dust. However, it is difficult to efficiently handle such issues with a limited budget, which also reveals the limitations of the systematic introduction of parks and green space policies. Preserving greenspace, both in terms of quantity and quality, is a pressing challenge today [5]. Cities operate organically, such as green park areas, landscapes, ecology, and culture [6]. Since various urban problems cannot be solved in a short period of time, I would like to examine the strategy of introducing a sustainable parks and green spaces policy.

1.2. The Purpose of the Study

Policy refers to "a basic guideline related to the policy goals determined by an authoritative government agency through various political and administrative processes, and related to the policy means to achieve them; it is a sub-system of learning and networks or interaction" [2]. It should present a long-term vision for the setting of policy goals. However, due to the political inclination of policymakers, who are often interested in short-term decision-making, the consistent implementation of parks and green space policies becomes difficult; politicians tend to focus on quantitative aspects for short-term results. Given this fact, it is all the more necessary to establish a new long-term policy, amidst the current legal and institutional enforcement, to establish parks and green spaces as urban green infrastructure and bring about a change in the global urban paradigm. This study aims to highlight the importance of South Korea's parks and green spaces policy, which has been recognized as a subsystem of urban policy according to changes in urban development. It defines the concept related to parks and green spaces and analyzes the correlation between urban development and parks and green spaces policy. It also presents the direction of the future course for policymaking by analyzing the green park area policy of Seoul in detail. The findings may offer guidelines to establish policy directions for highly metropolitan cities, such as Seoul.

2. Materials and Methods

2.1. Study Area

The spatial scope of this study was Seoul Metropolitan City. The administrative district area of Seoul was 605.19 km^2; the park area of Seoul was 168.20 km^2, and the proportion of parks and green spaces was 27.79 percent of the total area [7]. As the capital of South Korea, Seoul is a megalopolis with a population of 10 million, a fifth of the total population of South Korea [8]. The population trend is decreasing from its peak in 2010 [7]. Since the country's industrialization in the 1960s, it has experienced a rapid shift in urban planning and parks and green space policies. This study critically analyzed the history of parks and green space policies by period—from 1962, when Seoul's urban development began in earnest, to the term of the sixth mayor elected by the people of Seoul (2015–2018). It established the concepts of parks and green space and green infrastructure by means of the literature review. It analyzed parks and green space policies based on the Study on the Policy Direction of Parks and Green Space in Seoul (1995), 2030 Seoul Parks and Green Space Master Plan (2015), and Metropolitan City White Papers (2015~2020). Based on this analysis, this study attempted to provide policy suggestions to induce policy changes related to parks and green spaces in Seoul with global competitiveness. Urban parks and

green spaces have the potential to be utilized as green infrastructure, and parks and green space policies can be formulated to solve issues such as climate change, urban decline, and urban environmental problems. The research site's location and landscape is shown in Figure 1.

Figure 1. The research site's location and landscape.

2.2. Data Collection

A literature review was the main research method of this study. As for urban development and changes in Seoul's parks and green space policies, search keywords such as "urban park, green space, parks and green space policy, open space, urban development, green infrastructure, urban planning, urban paradigm, and sustainable city" were found through websites, such as Research Information Sharing Service (RISS), Koreanstudies Information Service System (KISS), DBpia, Science, Elsevier Science, ProQuest, Oxford University Press and Google Scholar (scholar.google.co.kr). Regarding information about Seoul, the Policy Direction of Parks and Green Space in Seoul (1985, 1995), the 2030 Seoul Parks and Green Space Master Plan, four research reports on the policy direction, and online materials were used for analysis. In terms of the criticism of Seoul's parks and green space policies, the political, economic, social and cultural conditions and environmental and technological aspects were identified and analyzed by period, through the perusal of a total of 10 articles, including theses, academic journal papers, research reports, and newspaper materials. The list of research materials is shown in Table 1.

Table 1. Research materials related to city and policies.

Category	Designation	Type of Study	Main Contents
Thesis (Source: RISS, KISS, DBpia, etc.)	History of Korean urban parks and legal system of urban parks Analysis and directional setting of parks and green space policies Changed characteristics of parks and green space in line with urban changes National and urban planning policy and changes in Seoul's environmental policies Policy decisions and types of local government heads	Time-series analysis of change and characteristics by period	History of urban parks History of parks and green space policies Changes in cities and parks and green spaces Urban and environmental policies Leadership of local government heads
Research reports and data on Seoul	Seoul's parks and green space policy directions (1985, 1995) 2030 Seoul Parks and Green Space Master Plan (2015) Plans for re-establishing parks and green space policies Green infrastructure, and urban paradigm change	Research on policy direction	Changes in Seoul's parks and green space policies Status, map, and graph of Seoul City Suggestion of policy development direction Urban paradigm change

Table 1. *Cont.*

Category	Designation	Type of Study	Main Contents
Online Data	Seoul City Homepage, (https://www.seoul.go.kr, accessed on 19 April 2021) [9] Statistics Korea (https://kostat.go.kr, accessed on 19 April 2021) [8] The Seoul Institute (https://www.si.re.kr, accessed on 1 May 2021) [10] Seoul history archive (https://museum.seoul.go.kr, accessed on 19 April 2021) [11]	Research on policy materials by period Research on main projects by market Data on urban changes	Evaluation of main projects and interviews Seoul's major project plans Seoul's urbanization change, population movement, graphs, etc.
Newspaper Media	Maeil Economy, Kyunghyang Shinmun, Chosun Ilbo Yonhap News, Korean Economy, Asian Economy, Hankyoreh, Dong-A Ilbo, SBS News, TBS News	Reviews of key policies from 1993 to 2020 in Seoul	Policy Newspaper Article Search

3. Literature Review

3.1. Urbanization

A city is an area where a large number of people live collectively within a certain unit of space; the process in which the population and economic activities are concentrated, and subsequently the social structure and residents' lifestyle become urban, is called urbanization [12]. Human populations are shifting en masse to cities, which leads to a rapid increase in the number and geographical extent of urban areas [13]. Rapid urbanization is triggering huge problems and challenges, such as land insecurity, worsening water quality, excessive air pollution, housing affordability issues, environmental degradation, etc. [14,15].

According to the United Nations, more people live in urban areas than rural areas, with 55 percent of the world's population residing in urban areas as of 2018[1]. In 1950, 30 percent of the world's population was urban, and by 2050, 68 percent of the world's population is projected to be urban. Urbanization will chiefly contribute to changing the urban ecosystem [16]. The urbanization rate in South Korea is 92 percent, which is much higher than the global average [17].

3.2. Concept of Parks and Green Space

"Parks and Green Space" is a compound phrase comprising "parks" and "green space" [2]. It is a term that encompasses both legally defined parks and green spaces, non-building coverage area or areas around development sites, and open spaces in the natural environment [18].

As for the history of the concept of "parks and green space", before the advent of full-scale urbanization, cities and natural environments did not impose many restrictions on human activities. After the modern industrial revolution, a holistic concept of parks and green space emerged to protect the natural environment in cities and improve public health, recreation, and emotional life. The Athene Charter (1933) of the Congrès Internationaux d'Architecture Moderne (CIAM) emphasized that, as part of "the present state, crisis and countermeasures of the city" (Section 2), "all territories must have green space necessary for recreation". As urbanization began reducing green space, thus distancing human beings from nature, the need for urban parks arose from the perspective of the environment and sanitation [19,20].

It is assumed that the concept of a city was introduced in South Korea during the Enlightenment period. The Park Act was enacted in 1967, the Urban Park Act was enacted

in 1980, and the Act on Urban Parks and Green Areas was enacted in 2005 to newly define the concept of parks and green areas [19].

The deterioration of urban infrastructure and natural disasters as a consequence of climate change, such as floods, droughts, and heatwaves, are becoming serious challenges worldwide; as South Korea is no exception, such damages have been increasing annually [4,21]. To solve these problems, developed countries have emphasized green infrastructure as a key measure for sustainability, adaptation to climate change, and the construction of a pleasant city [20,22]. In particular, green infrastructure consists of the interconnection of green spaces, which preserves the value and function of natural ecosystems and provides human beings with corresponding benefits [23]. Therefore, the concept of parks and green space gradually developed from being an essential element of urban planning to addressing urbanization-related challenges (e.g., climate change or fine dust). The history of the concept of parks and green space in Seoul is shown in Table 2.

Table 2. History of the concept of parks and green space in Seoul by period.

Period	Concept	Features
Prior to Urbanization	Parks and Green Space = Nature	Primitive natural environment
Beginning of Urbanization (Enlightenment period)	Introduced as the concept of natural environmental protection, public health, and recreation in the city after the industrial revolution [24].	Elements of urban planning Recreation, serving as an urban shelter
Enactment of the Park Act (1967)	Limitation of green space throughout the country as the concept of a park (national, provincial, and urban parks) [12].	Separation of the Urban Planning Act and the Park Act Insufficient systematic legal framework
Enactment of the Urban Park Act (1980)	Separation of Urban Park from the Park Act Emphasis on the concept of parks in the city [12].	Concretization of the concept of parks and green spaces such as urban parks, green spaces, etc.
The Act on Urban Parks, Green Areas, etc. (2005)	Active introduction of urban parks and green space, and application of expanded parks and green space in response to urban expansion and citizens' demands [12].	Making parks and green spaces in development sites mandatory Organic connection of green space in urban areas and introduction of green networks
2030 Seoul Plan (2014)	Introduction of expanded green infrastructure in terms of value and functionality to improve the quality of parks and green space [7].	The concept of green infrastructure was introduced in the US in 2010 Eco-city as a sustainable solution to urban issues

Source: Influence of National and Urban Policies on the Characteristics of Urban Change in Korea [12], Restructured by the Authors.

3.3. Policy

The dictionary definition of policy is a course adopted by the government or political organizations, and it refers to the government's activities aiming to achieve public goals or solve public issues as a product of the political process. By synthesizing the opinions of several scholars, it has come to be defined as "a basic guideline related to the policy goals determined by the authoritative government agencies through various political and administrative processes, and related to the policy means to achieve them; a sub-system of learning and networks or interaction" [2].

While policy goals are achieved by various policy measures over a long period, policy measures are subject to political debate because their results appear quickly and affect the decision-making of politicians. The external environment of policymaking functions as an obstacle to policymaking; the economic, political, and social or cultural environments can be considered as the external environment [2]. The level of economic development affects the quality of national policies, and the political environment affects the rationality

of policymaking in a democratic country through the interaction of groups, rather than an individual's decision [25].

3.4. Concept of Green Infrastructure

Green infrastructure is defined as an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife [26]. It is not a new concept, and it has its roots in the attempts made to link natural areas, while considering the perspectives of both landscape researchers who tried to connect parks and green space and bioecologists who tried to maintain biodiversity and conserve habitats. The term "green infrastructure" is generally the opposite of "gray infrastructure"[2] and started to be used in the US and UK in the late 1990s. The term "green infrastructure" was first used in a report on land conservation strategy prepared by the US Florida Greenways Commission in 1994. It was also defined as one of the five strategies envisioned for the development of sustainable communities in "the US President's Council on Sustainable Development", a policy report published by the US government in May 1999 [26]. Green infrastructure says it aims to give ecological value to desolate urban spaces and promote human welfare [26–28].

After 2000, regarding green infrastructure, more diverse concepts with new patterns have been propounded [29]. Green Infrastructure (GI), published in 2013 by the European Commission: Enhancing Europe's Natural Capital, defines regions with natural and other environmental characteristics as strategically planned networks to provide a wide range of ecosystem services. In the past, the quantity of green space was highlighted, but presently, there is a pattern of mixing or combining green spaces with other land uses or functions in cities, while highlighting goals such as the improvement of the urban quality, various experiences, and improved value. In addition to the function of reducing the environmental burden of parks and green space in the past, green infrastructure has been emerging as a countermeasure to new environmental problems, such as global climate change, urban flooding, heat island phenomenon, and fine dust [30]. Furthermore, the concept of green infrastructure goes beyond the existing functions (e.g., rest, recreation, and walking) and benefits (e.g., passive actions such as preservation and conservation) of parks and green spaces; it is now considered as an infrastructure for active production, creating an economy for cities, and social, cultural and environmental values for the public [6].

3.5. Green Infrastructure-Related Trends in South Korea and Other Countries

There have been studies directly dealing with domestic green infrastructure since the 2010s. Yet, they remained confined to a stage of limited application by only exploring new trends abroad, translating definitions, or studying specific cases. Mostly, they comprise approaches linked to urban planning and numerous policy proposals bolstered by the analyses of other countries' cases; the development of technical elements remains insufficient [29].

Regarding green infrastructure, the existing function of green spaces, other functions related to improving the urban water cycle, and ecological benefits to desolate urban spaces have been emphasized; such features have been mainly applied to policies related to Low Impact Development (LID) and rainwater management in domestic urban planning [4]. In the case of Seoul, focusing on parks and green space, which is the basis of green infrastructure, plans related to green spaces, ecosystems, biodiversity, and forest landscape should be accepted and reflected in the 2030 Seoul Parks and Green Space Master Plan. The Urban Master Plan should be consistent with the planning of parks and green space; currently, the change and designation of parks and urban planning facilities are based on the City Master Plan. The status of the Seoul Parks and Green Space Master Plan and the establishment procedure are shown in Figure 2.

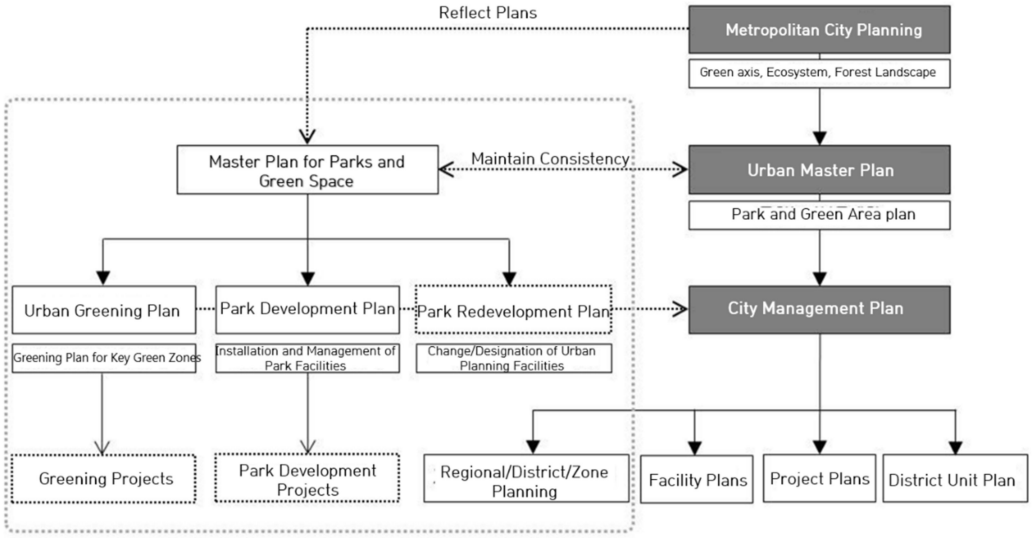

Figure 2. The Status of the Seoul Parks and Green Space Master Plan and the establishment procedure [7].

As a metropolis with a population of 10 million, Seoul requires complex solutions to several concerns, such as transportation, housing, environment, economy, welfare, and safety. The Seoul Metropolitan Government is introducing the concept of green infrastructure to solve urban problems, such as the urban heat island phenomenon, fine dust, localized heavy rains, and heatwaves, by reflecting recent issues and trends when implementing projects in each sector [31].

In the UK, under the 2012 enactment of the Localism Act, the existing 44 planning-related guidelines for land and urban planning were integrated into the National Planning Policy Framework (NPPF). The NPPF aims at achieving sustainable development as a guideline that suggests the direction of the UK land and urban planning policy [32]. In 2014, London Authority released the "London Infrastructure Plan 2050" and set green infrastructure as one of the important infrastructures [32].

In Seoul, Green Infrastructure emphasizes not only the functional aspects of improving urban water circulation but also giving ecological value to desolate urban spaces, so it is mainly applied to Korea as low-impact development (LID) and rainwater-related policies [33].

The concept and practical application of the policy around green infrastructure in the United States have focused on rainwater management. The reason that green infrastructure has become the subject of major policy discussions in the US is deeply related to water pollution caused by rainwater runoff. According to the US Environmental Protection Agency (EPA), the green infrastructure policy is operated in eight systems. Eight green infrastructure policies are as follows: stormwater regulation, the review and revision of local codes, demonstration and pilot projects, capital and transportation projects, education and outreach, stormwater fees, stormwater fee discounts, and other incentives [33,34].

4. Results

4.1. History of Urban Development

4.1.1. History of Urban Development of South Korea

Urban development is a series of intentional actions to promote and develop cities in response to the demands of urban change. It can be defined as an act by which social and cultural changes in cities alter the concept and theories of urban planning, and its implementation changes urban spaces [35].

The top-level plan of South Korea's spatial planning is the National Comprehensive Territorial Plan, which is established on the basis of the Framework Act on National Territory. It serves as a guideline for provincial, city/"gun" comprehensive, regional, and sectoral plans. The structure of urban development-related laws are shown in Figure 3.

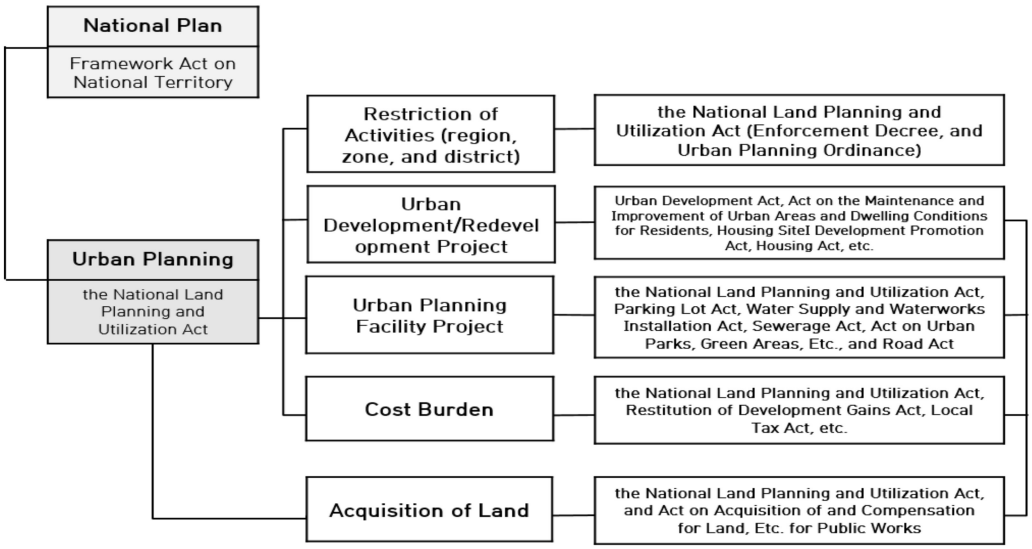

Figure 3. The structure of urban development-related laws [35].

While urbanization in advanced Western countries progressed before and after the industrial revolution, in South Korea it advanced after Korea's liberation from Japan in 1945, which is the general opinion. Industrial processes in the country have progressed alongside urbanization and urban development since 1960 [12]. Since the 1960s, Korean society has rapidly shifted from a rural-centered society to an urban society. Urbanization is a process of forming and expanding the physical space of a city, and simultaneously, it refers to the advanced industrial structures of the city, and the changed lifestyles and ways of thinking of the residents [17]. Urbanization in South Korea can be divided into four stages: early, industrial, metropolitan, and late urbanization [17]. In general, early and industrial urbanization refer to the periods before 1980, while metropolitan and late urbanization refer to the periods after 1980—the period of stable national growth.

The urbanization rate of South Korea increased from 28.3 percent in 1960 to 43.3 percent in 1970; the population increased by more than 6 million in the same decade. In 2010, the rate recorded was 90 percent; 9 out of 10 Koreans were living in cities [17]. The trends of urbanization rates of South Korea are shown in Table 3.

Table 3. Trends of urbanization rates of South Korea [8].

Category		1960	1970	1980	1990	2000	2010	2019
Total Population		24,989	30,882	37,436	43,411	47,954	50,516	51,849
Urban area	Urban Population	9770	15,471	25,718	34,555	42,375	45,933	47,596
	Urbanization Rate (%)	39.1	50.1	68.7	79.6	88.3	90.9	91.8
Administrative district	Urban Population	6996	12,710	21,434	32,309	42,055	45,278	47,240
	Urbanization Rate (%)	28.0	41.2	57.3	74.4	87.7	89.6	91.1

South Korea has had rare urban cases, as its cities became global-scale cities in the shortest time periods since 1950. The number has increased from 27 cities and provinces to one Special City, six metropolitan cities, and 100 other cities. Today, 60 percent of the population live in apartments, in a country which previously had no concept of apartments. The housing supply rate has also increased to 113 percent, along with changes in family types [17]. While other countries built cities over several hundred years, South Korea constructed its cities in the seven decades after its liberation. However, this apparent miracle was not what it seemed, since urban dwellers had to face social and economic disparity and intergenerational conflicts due to the rapid and constant change in urban

areas. The transformation in the urban areas in Seoul is shown in an analysis of urban areas using satellite imagery in Figure 4.

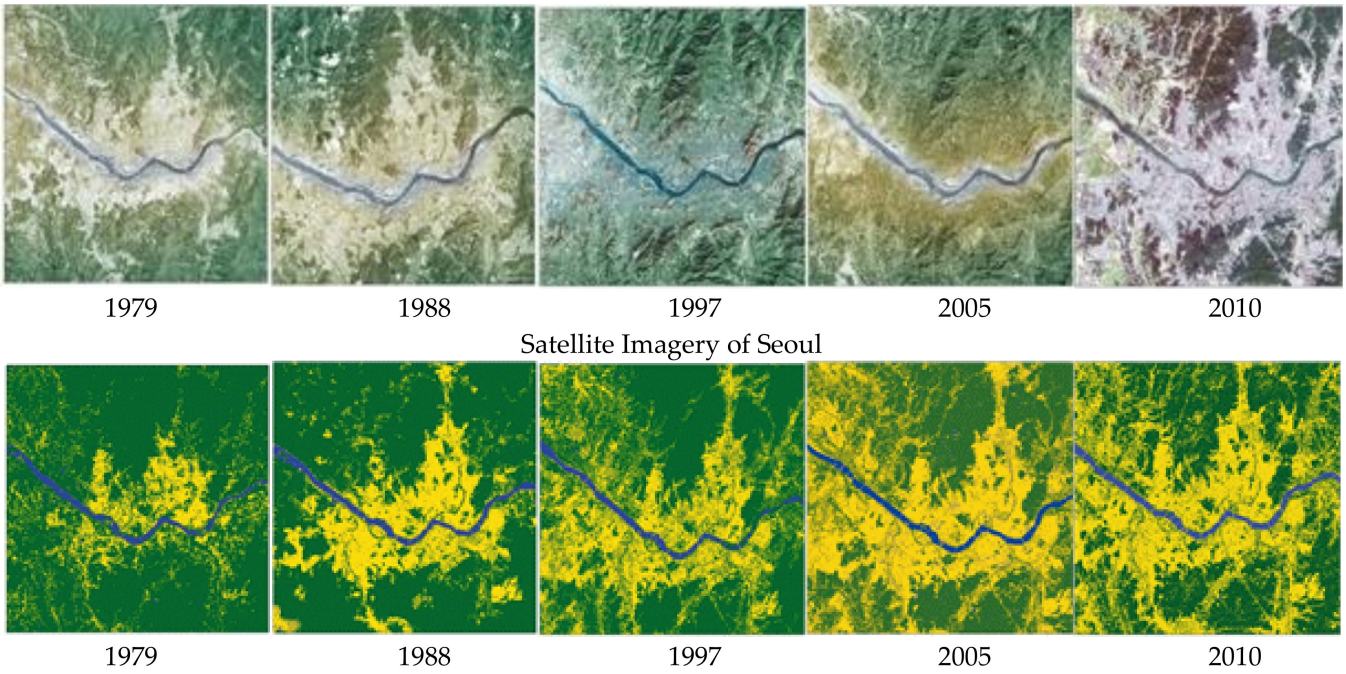

Figure 4. Change in urban areas in Seoul [10].

4.1.2. Characteristics and Cases by Period

As for the urbanization and urban development in South Korea, the processes can be divided into three periods: Urbanization after the Liberation (1945~1960), Compressed Urbanization (1961~1990), and Mature Urbanization (1991~) [17].

Urbanization after Liberation (1945~1960)

During the phase of urbanization after the liberation, there was a period of reconstruction of cities and rural areas damaged in the war, mainly following the Korean War (1945–1950), with the help of foreign aid. At this time, the population was concentrated in urban areas while economic growth was slow and the income level low due to external factors, such as the surge in Koreans returning after the liberation, the division of the nation, and the Korean War. Approximately 1.8 million Koreans flowed into the country from abroad between 1949 and 1954, and 650,000 people escaped to the southern part of Korea during the Korean War. After the War, due to the migration from rural areas to urban areas, population concentration in urban areas accelerated, which resulted in serious issues, such as unemployment, poverty, housing shortages, lack of urban infrastructure, and poor environmental sanitation facilities. In particular, the housing issue was the most pressing problem, caused by a housing shortage and leading to a decrease in the rural population [17]. In the housing sector, the period saw a focus on "establishing policies and systems", and housing policies supported industrialization. A large-scale project to create new urban areas began to supply more housing within cities.

This period had the following urbanization-related characteristics: urbanization was not based on urban growth, but rather, the city was created under special circumstances, such as the Liberation and Korean War; without setting sound conditions for urban labor, the city faced overurbanization and urban primacy [36].

Compressed Urbanization (1960~1980)

Along with the establishment of the First Five-Year Economic Development Plan (1962–1967) in 1962, state-led industrialization began during this period. From the early stage of industrialization to the 1980s, urbanization was in rapid progress in almost all cities, including large, small, and medium-sized ones. The main task of urban policymakers in the 1970s was to solve the problems relating to the concentration of population and industry in large cities and metropolitan areas due to economic growth and industrialization. Accordingly, in 1971, the Urban Planning Act was completely amended, emphasizing enforced regulations on urban land use. The strongest regulation was the introduction of the Development Restriction Zone System to prevent the chaotic expansion of large cities and to preserve nature and the urban environment [17,36].

In 1980, as the national population exceeded 40 million and the urbanization rate rapidly increased, a new urban planning system was required. The revised Urban Planning Act of 1981 stipulated the introduction of the Urban Master Plan and annual execution plans. It intended to prevent unplanned and disordered urbanization in advance by introducing a public hearing system for residents and the establishment of an urbanization adjustment zone. In 1989, a plan to build 2 million houses was formulated to supply houses through various housing welfare policies. In the 1980s, during the transition period driven by internationalization and democratization, various policy demands were raised by citizens.

Mature Urbanization (Since 1990)

Prior to the 1990s, the Korean society experienced a period of high growth and had established an industrial structure centered on the manufacturing industry. Since the 1990s, as de-industrialization set in and the economy became service-oriented, the phenomenon of economic globalization has also intensified [17,36]. In this period, the first urbanization rate stagnated, and the population movement itself decreased. This means that the population that could locomote; it reached the limit due to the aging of residents in rural areas, and the urbanization—the migration of rural populations to urban areas—was complete. Recent trends of population movement show a trend of a higher proportion of people moving between cities, rather than between urban and rural areas. Population migration in Korea peaked at around 25 percent in the mid-1980s and has been continuously decreasing. The trends in the number of people moving and the rate of movement are shown in Figure 5.

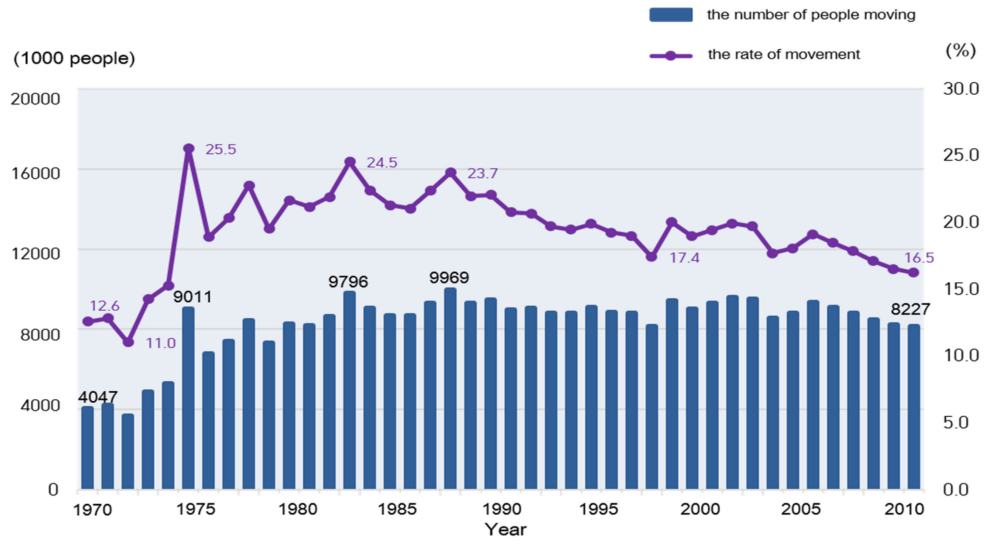

Figure 5. Trends in the number of people moving and the rate of movement (1970~2010) [10].

Second, in the 1980s, the growth of large cities led to urbanization. After the 1990s, the proportion of the population in the metropolitan area increased from 41.8 percent to 49.1 percent, but the proportion in special and metropolitan cities decreased from 49.3 percent to

46.1 percent [10]. The population of Seoul began decreasing after reaching its peak in 1990, while those of Busan and Daegu also reached their peaks in 1995 and 2000, respectively. Incheon, however, was continuously experiencing population growth due to concentrated large-scale projects. Even during the 1990s, the population in the metropolitan area had been increasing, but the population growth rate had been continuously decreasing; population growth was mainly due to natural growth, rather than population movement [17,37].

In the 1990s, with the revision of the Urban Planning Act, systemic deficiencies were largely supplemented through the establishment of a metropolitan plan, introduction of a detailed planning system, establishment and distribution of commercial areas, and subdivision of general residential areas [17].

In the 2000s, the side effects of reckless development, due to the deregulation of land use, became an issue. In particular, as the environmental issue became even more critical, an eco-friendly land-use system and various policies for eco-friendly green development and urban regeneration were established [17].

In addition, beginning in 2000, there were attempts to create a resident-led urban environment by encouraging people to directly participate in the urban policymaking process. The characteristics of urbanization and relevant cases in South Korea by period are shown in Table 4.

Table 4. Characteristics of urbanization and relevant cases in South Korea by period.

Period		Characteristics of Urbanization	Cases
Urbanization after the Liberation	Between the period after the Liberation and the period after the Korean War, the beginning of national restoration (1945~1960)	Without setting sound conditions for urban labor, due to the Liberation and the Korean War, there were phenomena such as overurbanization and urban primacy Rural to urban migration resulted in unemployment, poverty, housing crisis, insufficient urban infrastructure, and severely poor environmental sanitation facilities in urban areas Preparation of the institutional foundation for national land and urban policy, to achieve economic development, more employment, and a modernized social system	Full-scale construction of national lands after 1960 (Flood prevention, irrigation, reforestation, road construction, etc.) Housing complex in Hwagok-Dong (1966) Such development projects as Yeouido project (1967), Yeongdong Development project (1968), and Jamsil Development project (1970) were initiated
Compressed Urbanization	From the early stage of state-led industrialization to urbanization in all cities (1960~1980)	Establishment of economic development and comprehensive national land development plans, and the industrialization base by setting large cities as a growth pole. To solve the problems of the concentration of population and industry in large cities due to industrialization, the reinforced land use regulations and development restriction zone system were introduced. In Seoul and the Seoul metropolitan area, there were issues of housing supply centered on apartment houses/buildings, real estate speculation, and other socioeconomic problems Necessity for preparing a new urban planning system after the 1980s arose. Despite policies such as easing regional disparities and preventing concentration in the metropolitan area being initiated, problems of disparity between the metropolitan and non-metropolitan areas were not solved.	Designation of areas (12 downtown districts in Seoul) subject to redevelopment in the 1970s Based on the 10-year plan for construction of 2.5 million housing units in 1972, apartments in Gangnam New Town led by private companies started to develop. Large-scale housing site development, along with the 5 million housing supply plan in 1980 (Gaepo, Godeok, Mok-dong, Sanggye, Junggye, etc.), was initiated.

Table 4. *Cont.*

Period		Characteristics of Urbanization	Cases
Mature Urbanization	Deindustrialization, globalization, change to the service industry, democratization, and revitalization of popular culture, a period of high growth (After the 1990s)	Decrease in population movement due to the stagnant urbanization rate, and the period of completing the rural to the urban migration As for population movement, there was a higher population movement between cities, rather than between urban and rural areas The real estate market was unstable due to the IMF crisis, and the introduction of a local self-governing system brought about the higher importance of preparing urban policies for the city itself Environmental destruction and reckless development due to the new town policy became issues, and there were diverse policies such as environmentally friendly land use, eco-friendly green development, and urban regeneration	Housing supply policy implemented by lifting development restrictions in large cities (first new towns: Bundang, Ilsan, Jungdong, Pyeongchon, and Sanbon). Policy of suppressing real estate speculation (housing finance policies such as reconstruction regulation, price ceiling system, LTV, and DTI, as well as more long-term lease houses) was implemented Development of second new towns (Pangyo, Hwaseong, Dongtan, Gwanggyo, etc.) began.

Source: The 70th anniversary of the Liberation: The history of urban planning in Korea [8], Reconstructed by the Authors.

4.2. Urban Development Trends in Korea and Other Countries

Since the 1990s, the importance of sustainability for society, economy, and culture has been highlighted globally. After the 2000s, Korean society entered an era of low growth due to the decrease in economic and population growth rates, respectively. If large cities failed to adapt to the changing paradigm, there would be a widening gap between them, thus causing them to lose their growth engines and shrink in size. Owing to global environmental problems and urban aging, urban development in the low-growth era would further emphasize qualitative and non-physical aspects, such as quality of life, comfort, happiness, health, and safety. In other words, a higher number of jobs and jobs of better quality in cities are set to become important drivers and indicators of urban development. The urban paradigm is changing around cities, with convergent thinking that encompasses new values, such as happiness, sustainability, safety, restoration, and inclusion replacing values, including efficiency and competitiveness, which were required to enhance national competitiveness in the period of high growth [38].

The United Nations also proposed 17[3] Sustainable Development Goals (SDGs) for member countries to jointly promote from 2016 to 2030. Global cooperation agendas have been formulated and promoted to mitigate the threats that hinder each member state's sustainable development. Worldwide, problems, such as hunger, economic and social inequality, poorer quality of life, fewer jobs, and environmental degradation, have been exacerbated by regional imbalances in urbanization. Moreover, scientists emphasize the importance of greenery in cities. The presence of natural areas affects the quality of life in many ways. In addition to environmental and ecological services, urban nature has important social and psychological benefits that enrich human lives [39–41].

4.3. Correlation between City and Green Infrastructure in the Era of the Fourth Industrial Revolution

The Fourth Industrial Revolution is characterized by hyperconnectivity and superintelligence, with wider impacts and at a faster rate than the previous industrial revolution. As it was mentioned in the 2016 World Economic Forum, it has been used as a term for the new industrial age based on information and communication technology. The complexity of this ecosystem has increased exponentially in the previous few decades as rapid processes of urbanization have seen more than half the world move to cities and the introduction of technologies for management and communication have created entirely new networks, interactions, and systems [42]. Smart cities are rapidly spreading internationally

and, as a survey by Markets and Markets shows, the global smart city market is growing at an average annual rate of 18.4 percent. Furthermore, the US Consumer Technology Association predicts that 70 percent of the world's population will live in smart cities by 2050 [43]. According to the Act on the Promotion of Smart City Development and Industry enacted in Korea, a smart city refers to "a sustainable city wherein various city services are provided based on city infrastructure constructed by converging and integrating construction technologies, information and communications technologies, etc. to enhance its competitiveness and livability". The recently established smart green cities show this urban trend that emphasizes securing sustainability in consideration of the social and economic sectors while strengthening the environmental characteristics of the existing smart city [44].

In terms of the parks and green space strategies in global cities, green infrastructure is introduced as a new strategy of urban development in the old paradigm of urban infrastructure, to realize a socially, economically, culturally, and ecologically sustainable city. Green infrastructure is beyond the concept of point and line in a city in which there existed parks and green space; it is possible to build much more greens with the promotion of a surface-like three-dimensional strategy combining urban and green infrastructures. It is positioned as an urban strategy that creates new values by both complexly performing various functions, such as providing opportunities for recreation and rest, and appreciation of landscape and integrating with other infrastructures such as buildings and roads, as well as various fields such as culture and art [6].

4.4. Analysis of the History of Seoul's Parks and Green Space Policies

4.4.1. Current Status and Changes in the Seoul Parks and Green Space

Seoul is South Korea's center of politics, economy, society, and culture with an area of 605.19 km^2. The actual city area is smaller than Tokyo or New York when including the green space of the mountainous terrain surrounding the city. The metropolitan area of Seoul includes Incheon Metropolitan City and Gyeonggi-do, and it covers an area of 70 km^2 from downtown Seoul onwards [45]. Seoul's population was 9,668,000 as of 2020, which was higher than that of New York or Tokyo. In terms of land use, the areas of green open spaces account for 31.9 percent, residential land for 18.9 percent, residential and commercial mixed land for 13.0 percent, transportation facility land for 10.5 percent, rivers and lakes for 8.1 percent, commercial and business land for 5.9 percent, and the public land for 5.1 percent. The status of land use and the current status of parks and green space in Seoul are shown in Figures 6 and 7.

As of the end of December 2017, the total area of parks and green spaces in Seoul was 168.20 km^2, and the park area per capita was 16.48 m^2/person. However, the created park area was 146.57 km^2, and the undeveloped area was 21.62 km^2, thus accounting for approximately 87.14 percent of the planned area. The park area per capita was 15.92 m^2/person in 2007, 16.19 m^2/person in 2013, and 16.48 m^2/person in 2017, which reveals the trend of continuous increase. However, Seoul is mountainous, and parks and green spaces are mostly distributed outside the city center; it has a lack of neighborhood parks and green spaces[4], and unequal distribution by region. As the actual area of neighborhood parks per capita is 5.42 m^2/person, it is less than half the existing park area per capita.

The changes in Seoul's parks and green space policies were in line with the redevelopment of the city center to recover from war damage caused by the Korean War after the Liberation, when park sites were illegally converted into sites for residence and buildings. Along with the enactment of the Urban Planning Act and the Building Act in 1962, parks were legislated as urban planning facilities. The enactment of the Park Act in 1967 and the establishment of development restriction zones in 1971 provided the foundation for the system of green space in Seoul. Yet, various development projects in the 1970s entailed the frequent lifting of land for parks, which resulted in fewer parks and green spaces. Park development projects were carried out in the 1980s, such as the Han River Citizen Park, Olympic Park, and Seoul Grand Park (1984). The 1990 Urban Master Plan for Seoul City was the first legal plan to place emphasis on plans regarding parks and green spaces. As for

policy proposals regarding parks and green spaces, policies with normative and internal guidelines were established through the 1985 "Study on the Policy Direction of Parks and Green Spaces in Seoul". Owing to certain changes, such as the implementation of a local self-governing system, alterations in urban structure, increased participation of the private sector and citizens, and diversified demand for leisure in the 1990s, policies for parks and green spaces in Seoul in the future were suggested through the 1995 "Study on the Policy Direction in Seoul". After the enactment of the Act on Urban Parks, Green Areas, etc. in 2005, a legal policy plan, the Master Plan for Parks and Green Space, was established every 10 years. The Seoul Metropolitan Government established the 2015 "Master Plan for Parks and Green Space" based on the 2030 Urban Master Plan. Despite citizens' demands for improving the urban environment, Seoul lacked a balance of parks and green area, green area network connectivity, and strategies for parks and green areas.

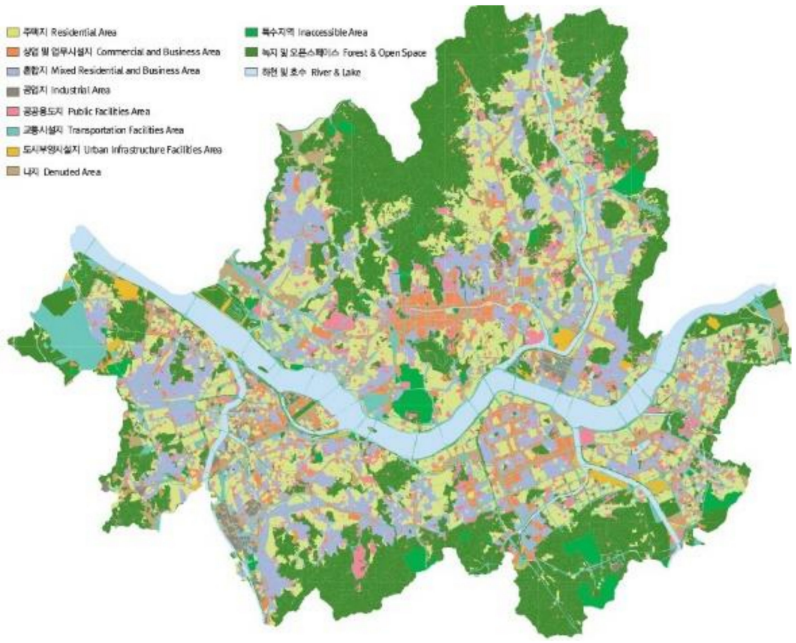

Figure 6. Status of land use (2010) [10].

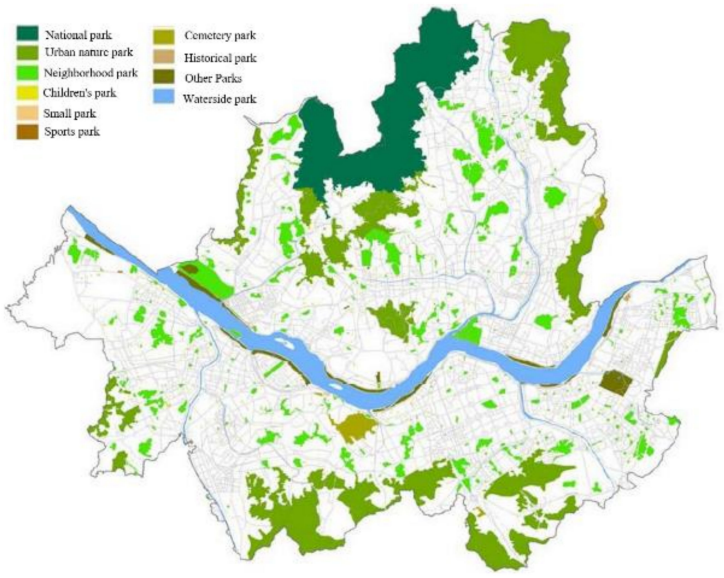

Figure 7. Current status of parks and green space in Seoul [7].

4.4.2. History of the Seoul Parks and Green Space Policy

Seoul's parks and green space policies began in earnest when the Urban Planning Act was enacted in 1962 to meet the need for systematic urban development. Parks and green space policies started to be classified by period from 1962: Introductory Period (1962~1979), Settling Period (1980~1993), 6 Popular Election (1994~2018). The Introductory and Settling Periods were led by government-appointed mayors, and parks and green spaces were handled as part of the urban planning framework. Urban expansion and various development projects led to a significant decrease in parks and green spaces, and the spaces were managed within the state-led urban planning policy framework. During the local autonomy era in 1993, citizen participation brought about a change in paradigm of parks and green space-related policies, which started to be taken more seriously, as espoused in various mayors' promises. Given this fact, this study analyzed policies while focusing on the periods of popularly elected mayors, in consideration of the internal factors of policy decisions (e.g., the orientation of policymakers, structure of organizations, and internal conditions) and the external factors of the same (e.g., economic, political, social, and cultural environments).

Introductory Stage (1962~1979)

In 1962, the Urban Planning Act and Building Act were enacted, and the National Palace and military cemeteries were designated as parks. There were classifications, such as Grand Park, Neighborhood Park, Children's Park, and Cemetery Park. To foster and protect the forest, the Korea Forest Service was newly established, and the Comprehensive Beautification Plan for Namsan was formulated. The Ministry of Construction endorsed the criteria for re-organizing parks; after the enactment of the Parks Act in 1967, 13 national parks were designated and classified (e.g., natural parks, ordinary parks, neighborhood parks, road parks, children's parks, and cemetery parks). In 1971, the Urban Planning Act was completely revised, and urban parks were categorized into children's parks, nature parks, neighborhood parks, and cemetery parks. In 1973, the Saemaeul Movement (the new community movement) started as a project for greening communities and reforestation. In 1974, Supyoso Park (urban small open space), the forerunner of small parks in South Korea, was opened. Along with the Namsan Development and Marronnier Park opened in 1975; the construction of Seoul Grand Park started in 1978. The Seoul Metropolitan Government changed the name of the Forestry Division to the Green Space Division in 1966, and a sub-division of park facilities was established. In 1971, the Green Space Division had sub-divisions, such as forestry administration, park management, and reforestation protection, and the designation of green belts. Along with the establishment of a secretary system in charge of landscaping in the Blue House, the parks and green space field was developed in 1973. The Green Space Division under the Green Space Bureau was expanded, comprising the Landscaping Division, the Green Space Division, and Parks Division.

Settling Period (1980~1993)

After being separated from the Parks Act in 1980, the Natural Park Act and Urban Park Act were revised. In 1981, development projects for the Han River were promoted to create a resting space around the river and secure green spaces. In 1982, under the (first) Five-Year Plan of Greening the Capital, the Green Seoul campaign was promoted to inspire citizens' awareness of greening. In 1987, under the (second) Five-Year Plan of Greening the Capital, the level of urban landscape was improved, along with the creation of landscape forests and introduction of landscape design in Seoul; in 1989, a project to revive eight large mountains outside Seoul was introduced. In 1991, the Committee on Urban Park was organized; the Namsan park rehabilitation project was promoted, and the authority to create parks was transferred from the Minister of Construction to mayors or governors. As for the organization of office, in 1981, the Environment Bureau and Parks and Green Space Bureau were integrated and collectively changed to the Environment and Green Space

Bureau. Subsequently, the government organizations were reduced and reorganized from one bureau and three divisions to one division.

The First Popular Election (1994~1997)—Mayor Cho Soon (1 July 1995–9 September 1997)

In the local autonomy era, citizen participation led to higher demand from citizens for the construction of an environmentally friendly city and a pleasant environment in the 21st century. The period focused on the conservation and expansion of parks and green spaces, as it was a transitional phase in urban policy to create a human-centered City of Seoul. In 1995, the Five-Year Plan for Expanding Parks and Green Space was established, which was the first policy to resume the expansion of parks and green spaces in Seoul. After boldly compensating for the relocation of factories in areas with insufficient parks, the area was converted to a main park. Without selling the municipal land, the parks and green space policy was implemented fully, including measures such as a quantitative expansion by securing small parks first, improving the quality of urban green spaces, encouraging citizens to participate in more greening projects, and creating ecological parks. As for the organization of office, in 1996, along with the establishment of the Environmental Management Office, the Environment Planning Division was separated into the Parks Division and Green Space Division, respectively. In 1997, there was the following reorganization: the Environmental Management Office was merged with the Parks Division, Green Space Division, and Landscaping Planning Division.

The political orientation of Mayor Cho Soon of the opposition party was different from the Kim Young-Sam government at the center. He was a reformist economist who insisted on economic justice, such as the public concept of land ownership, a real-name financial transaction system, and balanced growth, with his own principles and beliefs. This period witnessed rapid economic growth after the 1988 Seoul Olympics, and South Korea seemed to be enjoying an economic boom due to deregulation policies, such as opening up and liberalization of the economy followed by the globalization declaration of the Kim Young-Sam government. However, South Korea soon underwent the Asian economic crisis and had to face the IMF era. Socially, due to major accidents, such as the collapse of the Seongsu Bridge, the city gas explosion in Ahyeon-Dong, Mapo-Gu, the gas explosion at the Daegu subway construction site, and the collapse of the Sampoong Department Store, a new mayor took over duties. The change in guard was a result of a greater interest in urban safety, while introducing citizen-centered democratic administrative measures and economic application to the administration. A paradigm changed with a policy shift that prioritized balance over growth, and quality over quantity, while shifting from the material to the humane period.

The Second Popular Election (1998~2001)—Mayor Ko Geon (1 July 1998~30 June 2002)

During the term of the second mayor elected by the people, there were attempts to change to a greener city from a gray city, with the policy "planting 10 million trees of life", and projects with citizens to preserve green spaces. More than 10 million tall trees and shrubs in total (1.65 million tall trees and 1476 shrubs) were planted by actively utilizing open spaces around living zones, thus creating a World Cup Park in preparation for the 2002 FIFA World Cup, conducting greening projects with citizens through commemorative plantings, and creating small parks in areas with insufficient parks. As for greening around living zones, the following projects were promoted: wall removal in public institutions, greening roofs and schools, and establishing village yards. In terms of urban green belts, forest belts around airport routes, greening railroads and walls, and greening the Han River Citizen Park and Gangseo Marsh Ecological Park were implemented. There were other projects as well: restoration of Naksan through parks and forest reforestation, conversion of Yeouido Plaza into a park, creation of trails for learning and observing nature in nearby mountains, establishment of urban environment forests and urban economic forests, greening projects with citizens, creation of forest of hope, introduction of a real-name system to manage green space, a system for registering large trees, and maintenance treebanks.

These projects have been continuously promoted to date. As for the organization of office, there was separation of the Parks and Green Space Division and the Landscape Division under the Environmental Management Office; in 1999, the sub-division of Parks and Park Development was divided into the sub-divisions of Urban Park and Natural Park.

As for the political situation, Mayor Ko Geon had a politically favorable situation for operating the administration services, as President Kim Dae-Jung was elected in the 15th presidential election and the democratic party (called the National Congress Party at the time) formed the majority in the central government, 19 autonomous districts in Seoul, and city councils. There was prolonged economic depression that witnessed the bankruptcy of large corporations and mass unemployment due to the Asian financial crisis at the end of 1997. The country fell into a situation of mass unemployment due to fiscal contraction and restructuring, and social distrust prevailed. In this situation, a management approach was applied to the city's administration and budget's execution, and transparent administration was promoted as a major policy. Even in this period, there were increasing demands by citizens for the preservation of the urban environment [46].

The Third Popular Election (2002~2006)—Mayor Lee Myung-bak (1 July 2002~30 June 2006)

During the term of the third mayor, the Four-year Plan, from 2002 to 2006, had as a goal: "Increase green space by 1 million pyeong (3305785.12 m^2) within the living zone". First, the objective was realized by starting with a mid-term rolling plan that predicted and analyzed changes in long-term conditions over 10 to 20 years, and it was subsequently revised and supplemented annually to secure effectiveness. The plan was formulated with experts in each field while citizens' opinions were also considered. To implement policies, the roles of the public and private sectors were clearly determined to increase administrative efficiency; projects directly related to civic life were prioritized in terms of choice and focus.

To increase the green space of parks by 1 million pyeong within living zones, new parks and green space were expanded in areas with insufficient parks and green space to achieve regional equalization (neighborhood park per capita from 4.51 m^2 to 4.92 m^2). The restoration of the Cheonggyecheon Stream and connection of green spaces between northern and southern Seoul were promoted to improve biodiversity by restoring the ecosystem damaged by the disconnected green spaces in the city center. The projects concerning the expansion of parks and green spaces around living zones were: one neighborhood park per "dong", parks in schools, expansion of waterscape facilities, greening unused land, creation of Seoul Forest on the Ttukseom Island, and more greening of parking lots. To preserve and connect green spaces, the following projects were taken up: the creation of the long-delayed neighborhood parks and ecological trails, the connection of green spaces, support for greening of roofs, and riverside greening. For citizen participation, activities such as landscaping contests, support for the Green Trust Movement, and park volunteer programs were organized. As for the relevant organizations, in 2005, the Green Seoul Bureau was established along with the Parks and Green Space Policy, Parks Development, Landscaping, and Natural Ecology Divisions. The Parks and Green Space Management Center was divided into central, eastern, and western divisions to increase effective management of parks and green spaces.

Mayor Lee Myung-Bak was a businessman and belonged to the conservative Grand National Party. When he was elected, the Party chose 22 out of 25 boroughs, and its members occupied 81 of 96 seats in the city council; the mayor could, thus, smoothly promote the administrative work of Seoul. However, after Roh Moo-Hyun, who promised to relocate the capital and achieve balanced national development, was elected president, the mayor had a difference of opinion with the central government on political matters. In economic terms, youth unemployment was emerging as a social problem and the economic downturn was becoming serious. However, Seoul City reduced its debt to less than half within four years by promoting budget reduction and debt repayment. In social terms, the country quickly recovered from the IMF crisis through the opening of the Incheon

International Airport in 2001 and the legend of reaching the semifinals at the 2002 FIFA World Cup. Even though there was social instability as protests broke out due to the case of presidential impeachment and the entry, by force, into the free trade agreement, the mayor solved chronic complaints of the residents of Seoul city with an innate driving force. Measures, such as restoration of the Cheonggyecheon Stream (1 July 2003–1 October 2005) and the reorganization of the entire public transportation system, were taken to achieve the goal of balanced development between northern and southern Seoul [37].

The Fourth Popular Election (2007~2010)—Mayor Oh Se-hoon (1 July 2006~30 June 2010)

The term of the fourth mayor was a period when globalization, unlimited competition, and private partnership were emphasized throughout the municipal administration. Along with the implementation of the fourth item of the Seoul Vision—"Seoul, a clear and attractive world city,"—there was a project titled "More increase in 1 million pyeong (3,305,785 m^2) of green space in living zones", under the slogan of Seoul being an "Environmental city where people and nature can breathe", while aiming to restore disconnected ecological green spaces. During this period, the city focused on securing Seoul's unique identity, such as creative city administration, downtown re-creation, the Han River Renaissance, and Design Seoul, and created large-scale parks in northern Seoul for balanced development between southern and northern Seoul. However, there were allegations that the mayor had focused on external projects [45].

Representative projects included the restoration of urban landscapes and natural resources through the Han River Renaissance and Namsan Renaissance, which improved the accessibility to nature and created a pleasant environment for urban residents. After purchasing the deteriorated Dream Land in northern Seoul, the Dream Forest Seoul was created. The site of the Shinwol Water Purification Plant was converted into a lake park in western Seoul and the Seoul Iris Garden was established in northern Seoul. Children's Grand Park, Boramae Park, and Seodaemun Independence Park were rebuilt; to construct green networks, there were continuous projects, such as more support for the greening of roofs of buildings, creation of open green spaces in apartment complexes, greening scrap lands, and greening of schools, as well as the reconstruction of 300 old children's parks into the Sangsang Children's Parks. The Namsan Renaissance, launched in 2009, was an attempt to realize the branding of Namsan by suggesting six strategies within the broad framework of recovery and communication. As for the government's organization, the Green Seoul Bureau system, created during the term of the third mayor, was maintained during this period; the Han River Citizens Park Management Center was expanded to the Han River Business Headquarters to promote the mayor's strategic businesses; there was an increase in parks and green space projects and a corresponding expansion of the relevant organizations and budgets [47].

With the backdrop of the Grand National Party, the opposition party, sweeping most local government polls across the country—which can be interpreted as the mid-term evaluation of the Participatory Government—Mayor Oh Se-Hoon focused on the development of northern Seoul and air quality improvement projects. Design Seoul was set as the main policy. On the economic front, unemployment continued due to the unstable real estate market, higher consumer prices, and the global financial crisis of 2008. The Lee Myung-Bak government, which was elected in 2008, shared a political viewpoint with Mayor Oh. Thus, the mayor was able to smoothly proceed with the main projects related to creating an economically and culturally sound city as pledged, with the help of projects, such as the development of world design and fashion commercial district in Dongdaemun, construction of the world's fifth largest convention city, and creation of Magok district and Sangam Digital Media City(DMC).

The Fifth Popular Election (2011~2014)—Mayor Oh Se-hoon (1 July 2010~26 August 2011), and Mayor Park Won-Soon (27 October 2011~30 June 2014)

The Fifth Popular Election paved the way for two policy directions due to the resignation of Mayor Oh; from 2010 to 2012, projects to create regionally specialized centers, such as the southwest renaissance and northeast renaissance projects, were promoted. There were attempts to restore the history and identity of Seoul by restoring the historical and cultural heritage of Korea, such as the Seoul Fortress Wall, the large stylobate building around the Donhwamun area, and Former Prime Minister Jang Myun's house, that had been damaged during the Japanese colonial period. The construction of a green network in the city, connecting mountains, rivers, and villages, was expanded through projects to create the Jarak-Gil trails in the mountains near Seoul, improve the growth of street trees, and expand green spaces. There were also continuous projects concerning the greening of walls in the city center.

As Mayor Park Won-Soon took office in 2012, the Fukushima nuclear accident led to the promotion of principal policies, such as those energy policies centered around the "One Less Nuclear Power Plant Policy" and increased participation of civil society and the private sector. Rather than choose large-scale development, the mayor aimed at promoting "Seoul, a green city created and managed together with citizens", with more interest in gradual change and maintenance, such as planning, conservation, and management, as well as plans for revitalizing living zones socially, economically, culturally, and environmentally. Pedestrian-friendly roads were expanded; a plan to restore the natural environment of the Han River was established to restore the ecology and natural environment of Seoul; and citizen participation was expanded in the area of policymaking with projects, such as the citizen participation-based budget system and formation of citizen participation groups. Through the Declaration of Seoul as a Green City, the paradigm changed to that of a "park city" that encompassed streets, alleys, plazas, and rooftops. Along with three promotional strategies—the spread of green culture, increased spatial value, and spread of park operation—the following projects were taken up: nurturing citizen experts for which the Take Urban in 72 h Project, Promotion of "Seoul, a Blooming Flower" campaign, Citizen Gardener, and Urban Agricultural Specialist were adopted; the introduction of the street tree adoption system; parks 10 minutes away from living zones; conversion of abandoned railway sites on the Gyeongui and Gyeongchun Lines to parks; creation of an eco-school and green city; barrier-free parks; Seoul Seonggwak-Gil (fortress wall); maintenance of Jicheon-Gil; and creation of a customized neighborhood park, such as the children's forest experience center. The importance of parks and green space, however, began decreasing as policy priorities focused on solving social issues such as income polarization, jobs for youths, and elderly poverty and policy projects, such as urban regeneration, living wage system, and urban villages, which were closely related to residents' lives, were promoted.

As for parks and green space-related organizations, the Division of Disaster Prevention in Mountains was newly established under the Green Seoul Bureau due to the 2011 Mt. Umyeon landslide disaster. Compared to during the term of the fourth popularly elected mayor (2007~2010), organizational strength and budgetary allocation were reduced due to policy changes, such as increasing focus on resident participation programs rather than park development projects [47].

Mayor Park Won-Soon, a politician from a civic group, emphasized citizen-centered communication and trust and gave priority to welfare policies. A software-oriented policy was implemented, which gave top priority to restoring the quality of life through the improvement of individual welfare. The economy was slowing due to the financial crisis in the eurozone, though the real estate market was stabilizing; the economy was entering the slow-growth era due to the overall slow pace of economic recovery. Socially, there were problems, such as implementing welfare measures for the aged in view of an aging population, an increase in single-person households, a low fertility, youth unemployment, and social welfare issues; these issues were reflected in the urban policies of the period.

The Sixth Popular Election (2015~2018)—Mayor Park Won-Soon (1 July 2014~30 June 2018)

During the term of the sixth popularly elected mayor, the city continued to promote people- and welfare-oriented policies and public–private partnerships to solve social issues, such as low fertility, aging, income polarization in the era of low growth, youth employment-related issues, and elderly poverty. The second phase of "One Less Nuclear Power Plant Policy" was constantly being promoted, and policies such as a 20% reduction in ultrafine dust were given priority. Along with municipal goals such as becoming a Safe city, Warm city, Dream city, and Breathing city, the following projects were implemented: restoration of the natural environment of the River Han, the Happy Han River project (cultural activities), and the conversion of urban highways to parks (Gukhoe-daero and the Seobu and Dongbu Expressways). Other projects were also promoted: Seoul, City of Forests and Gardens, Thousand Forests and Thousand Parks project, small-scale biological habitat (Gegul Gaegul Biodiversity City), Seoul Dulle-Gil, Mapo oil storage base (Culture Park), Seoul Station Overpass 7017, and Citizens' Culture Park on the Nodeul Island. During this period, the private sector, including civic groups, were increasingly encouraged to participate in parks-related projects and maintenance. In 2016, the Seoul Green Trust began operating and managing the Seoul Forest; children's parks were re-created through collaboration between companies and private organizations. Regarding the organizations related to parks and green spaces, the organizational system during the term of the fifth popularly elected mayor was maintained; as part of urban regeneration, the maintenance of alleyways and gardening projects were mainly promoted with the participation of residents and consultative groups. Policy priorities, organizational strength, and budgetary allocations to projects were reduced.

This period saw confidence in social safety and the government fail due to the sinking of the Sewol ferry and successive accidents. Subsequently, in the sixth simultaneous nation-wide local elections highlighting safety as an election promise, Mayor Park Won-Soon of the Democratic Party was elected. Moreover, there was social and economic chaos caused by the spread of the Middle East Respiratory Syndrome coronavirus (MERS-CoV) and the impeachment of President Park Geun-Hye. Along with North Korea's missile-related provocations at the international level, the financial independence rate had been continuously dropping; a citizen participation-based budget system was introduced in budgeting to promote citizen participation. The changes in the Seoul Municipal Government's policies are shown in Figure 8. Analysis of policies by popularly elected mayors are shown in Table 5.

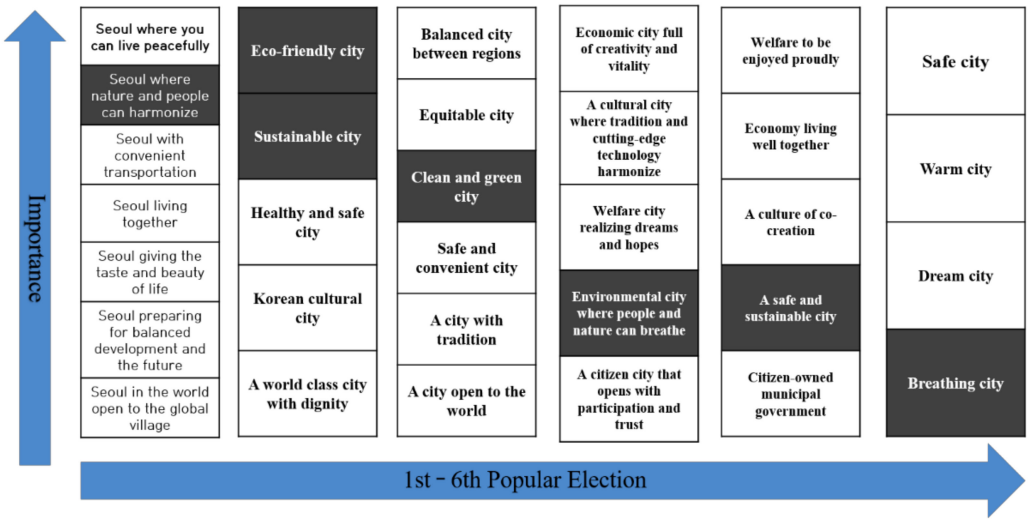

Figure 8. Changes in the Seoul Municipal Government's policies [47].

Table 5. Analysis of policies by popularly elected mayors.

Category	Political and Economic Conditions	Social and Cultural Conditions	Direction of Parks and Green Space Policies	Main Features
The First Popular Election (Cho Soon) 1995~1997	·Inauguration of Mayor Cho Soon's tenure, a reform-oriented economist who advocated economic justice ·After the 1988 Olympics, there was an economic boom via deregulation such as globalization, openness, and liberalization. ·The IMF era set in due to Asian economic crisis	Accidents such as the collapse of Sampoong Department Store, the collapse of Seongsu Bridge, and the gas explosion at the Daegu subway construction site. Increased interest in safety and environmental conservation Citizen-centered democratic administration	Five-Year Plan for Expanding Parks and Green Space. Quantitative expansion and qualitative improvement via the creation of main parks in places such as the Yeouido Plaza and creation of village yards. Inducing citizens to participate in greening projects, and creating ecological parks, etc.	The first parks and green space policy, human-centered balanced development, and a strategy that prioritizes quality over quantity
The Second Popular Election (Ko Geon) 1998~2001	Inauguration of Mayor Ko Geon who was friendly with the central government (the Kim Dae-Jung government) ·Continued recession due to bankruptcy of large corporations and mass unemployment due to the IMF foreign exchange crisis toward the end of 1997 ·Promotion of tax item exchange to resolve the financial imbalance between southern and northern Seoul	Construction of World Cup Park for the 2002 FIFA World Cup Improvement of funeral culture and expansion of funeral facilities Increasing civic demand for a better-quality urban environment ·Introduced a transparent administrative system in Seoul due to widespread social distrust (Online complaint handling system)	Planting 10 million trees of life, conservation of green spaces, transformation into a greener city, promotion of greening projects based on citizen participation, utilization of open areas around living zones, greening projects with citizens, and creation of small parks in areas with insufficient parks ·Conversion of Yeouido Square into a park, rooftop greening, village yard, railroad greening, tree bank, big tree registration system, etc.	·Promotion of diversification strategies for green spaces by developing the Five-Year Plan for Expanding Parks and Green Space ·Development of greening projects through commemorative planting by citizens ·Change in administrative paradigm designed to approach citizens
The Third Popular Election (Lee Myung-Bak) 2002~2006	Elected as a mayor, who was a businessman belonging to the conservative Grand National Party Political confrontation due to the Roh Moo-Hyun government's relocation of the capital and balanced national development plans Youth unemployment emerged as a social issue and economic recession aggravated ·Seoul Metropolitan Government reduced debt by less than half within four years	In the inaugural speech, the introduction of management administration with a business management approach was made More protests due to the president's impeachment case and the entry by force into a free trade agreement The mayor's driving force was recognized by the restoration of Cheonggyecheon and the entire reorganization of the public transport system	Further increase in green space by 1 million pyeong within living zones Parks in schools, expansion of waterscape facilities, greening unused land, Seoul Forest, greening parking lots, landscaping contests, Green Trust Movement, restoration of Cheonggyecheon Stream, creation of Seoul Plaza, etc. Expanded the organization with the establishment of the Green Seoul Bureau, Seoul Metropolitan Government	More participation of experts and citizens in establishing plans Clarification of the roles of the public and private sectors The project is promoted after priority project selection and concentration
The Fourth Popular Election (Oh Se-Hoon) 2007~2010	The majority of the opposition party, the Grand National Party, won the simultaneous nationwide local elections. Unemployment continued due to the unstable real estate market, high consumer prices, and the global financial crisis of 2008 ·Since the mayor shared political opinions with the Lee Myung-Bak government, the following projects were implemented: development of world design and fashion commercial district in Dongdaemun, promotion of economic and cultural cities such as Magok district and Sangam DMC	The death of former President Roh Moo-hyun led to a declaration of the state of affairs in all walks of life. Operation of 120 Dasan call centers, and changes to self-reliance and self-support with Seoul-style net welfare Development of rental apartments based on long-term lease housing (Shift) policy, station area-centered approach, and social mix method ·Travel project, Hope Plus account, and the completion of Memorial Park in Wonji-Dong in 2011	More green spaces by 1 million pyeong (3,305,785 m^2) in living zones Restoration of the disconnected ecological axis, and creation of Dream Forest Seoul in northern Seoul and Lake Park in western Seoul More parks and green space projects, such as the Han River Renaissance, Namsan Renaissance, Seodaemun Independence Park renewal, Sangsang Children's Park, more support for rooftop greening, and open green spaces in apartment complexes	Under the premise that design will determine urban competitiveness in the 21st century, promotion of renaissance projects in places such as the Dongdaemun Design Plaza (DDP), the Han River and Namsan Mountain Introduction of citizen participation policy through Sangsang Oasis Budget expansion for parks and green space projects

Table 5. *Cont.*

Category	Political and Economic Conditions	Social and Cultural Conditions	Direction of Parks and Green Space Policies	Main Features
The Fifth Popular Election (Oh Se-Hoon and, Park Won-Soon) 2011~2014	Park Won-Soon, a former civic group member, was elected as mayor, after Mayor Oh Se-Hoon's resignation due to the referendum on the free meals in schools policy Promoting major policies such as One Less Nuclear Power Plant policy, citizen-centered communication, and social welfare Priority policies to restore quality of life through personal welfare improvement The economic slowdown and the advent of the low growth era	Social welfare for the elderly due to aging, the increase in single-person households, and low fertility issues spawned other issues such as youth unemployment and social welfare Increased interest in climate change, due to the Umyeon Mt. landslide disaster caused by localized heavy rain Increased citizen participation in policymaking, such as the citizen participation-based budget system and the formation of citizen participation groups	Declaration of Seoul, as a greener city created and cultivated together with citizens Interest in gradual changes and maintenance, such as planning, maintenance, conservation and management of living zones based on social, economic, cultural, and environmental regeneration, rather than a large-scale development Pedestrian-friendly road expansion, natural restoration of the Han River, conversion of abandoned railway sites on the Gyeongui Line and Gyeongchun Line to parks, barrier-free parks, Seoul Seonggwak-Gil (fortress wall)	Less importance on parks and green spaces due to a higher interest in solving social issues such as income polarization, youth unemployment, and poverty amongst the elderly Promotion of projects through citizen participation and increased participation of the private sector Reduced project budget due to the concentration on resident participation
The Sixth Popular Election (Park Won-Soon) 2015~2018	The lowest benchmark interest rate due to the aftermath of the global financial crisis Economic deterioration due to soaring real estate lease prices, income polarization, youths unemployment, poverty amongst the elderly, and large-scale corporate restructuring The impeachment of President Park Geun-Hye and the start of the Moon Jae-In government (in 2017)	Large-scale spread of infectious diseases including MERS Large accidents such as the collapse of the Gyeongju resort gym and Gangneung Samcheok wildfire Recognition as natural disasters due to increased damage caused by heatwaves	Seoul, City of Forests and Gardens, Thousand Forests Thousand Parks Project, Creation of small habitats for living organisms, Seoul Dulle-Gil, Mapo oil storage base, Seoul Station Overpass 7017, Citizens' Culture Park on the Nodeul Island, conversion of urban highways to parks, alley maintenance, and gardening projects	Expansion of private participation such as involvement of civic groups in park projects and maintenance and management of the same As part of urban regeneration, the gardening of alleyways was promoted and the budget reduced

Source: Created by the Authors.

5. Discussion

South Korea's urban development went through industrialization from 1960, and 90 percent of the population now lives in cities as of 2010. As urban growth increased, the number of citizens demanding improvement in the quality of life and resolution of issues, such as housing problems, regional imbalances, and worsening urban environment also rose [48]. Since the 2000s, cities have remained in an era of low growth, and they have been changing to new paradigms, such as sustainability, safety, restoration, and inclusion to enhance national competitiveness [38].

With urban development, policies concerning parks and green areas have also changed from the initial perspective of quantitative expansion to that of qualitative improvement, and it can be seen that the global city's parks and green area policy has also introduced aging urban infrastructure as sustainable green infrastructure.

As for Seoul's parks and green space policies, they were carried out in line with urban policies, until popularly elected mayors were elected. The organizational strength and budgetary allocations were expanded to increase the quantity and quality of parks and green spaces from the first to the fourth term of popularly elected mayors. From the fifth mayoral term, as policies focused more on welfare and citizen participation, the parks and green space policies were promoted while considering resident participation-based programs. Policies have had the greatest influence on policy direction and priorities, depending on the value orientation of the head of a local government [5,49]; policies are determined by political, economic, social, and cultural conditions.

The difference from the existing literature was to compare the time-series policy flow after the urbanization of Seoul and to analyze the influence of policymakers' political

orientation, socio-economic, and cultural conditions. This is the basis for future direction setting and will provide solutions for sustainable policy implementation.

Seoul is a city that has undergone many urban changes over a short period of time, from the period of industrialization to that of an advanced information society, and it is expected to be the standard for developing cities around the world, showing them the history and future of establishing urban strategies. Therefore, to create a city in the era of the fourth industrial revolution with urban regeneration strategies and competitiveness in the era of low growth, we would like to make the following suggestions for policymakers of the parks and green spaces policy.

5.1. Re-Establishment of Parks and Green Space Concept Due to Paradigm Change

South Korea's urbanization has progressed rapidly through industrialization in the 1960s. As of 2010, 93 percent of the population were urban dwellers; a city has changed into a living space where citizens can live their daily lives. In the past, the main priorities of urban policy were to achieve economic growth and solve population and housing issues in large cities. The urban policy paradigm, however, is currently shifting towards a focus on solving urban issues, such as low growth, population decline, urban aging, and climate change. Large cities around the world are also experiencing the same issues as Seoul and implementing urban policies with such paradigms as happiness of urban residents, sustainability, safety, restoration, and inclusion. The concept of parks and green spaces goes beyond the physical concept of a natural environment, and it is necessary to introduce an expanded concept as part of policies related to green infrastructure to improve the health of citizens, the quality of life of urban residents, and secure urban competitiveness. Although each country uses the concept of green infrastructure in a different manner, it should be commonly recognized as "a strategically planned network of natural and other environmental factors that can provide a wide range of ecosystem services", and an active infrastructure-producing urban economy, and social, cultural, and environmental value for the public. Parks and green spaces should be recognized as green infrastructure, and an appropriate concept related to the same should be established.

5.2. Enactment of Laws and Systems for Integrated Management of Green Infrastructure

Urban regeneration has been progressing with the resolution of the deterioration of various infrastructures in large cities and decline in small and medium-sized cities in local regions. Urban regeneration strategies encompass discovering attractive factors in cities, reviving the local economy, improving cultural and environmental value, and increasing self-sustainability in local areas. In this process, parks and green spaces serve an essential role, but there are limitations in comprehensive and systematic applications from the urban perspective due to the fragmentary and limited application of laws stipulated in various legislations and regulations. There exists a concept of green infrastructure; however, to apply it in practice, there should be a legal system, namely "the Green Infrastructure Act", which enables the security of the legal status of other infrastructure in cities and can be applied in a convergent manner [44].

The existing green infrastructure in South Korea is chiefly related to rainwater management as part of urban planning. In the UK, the guideline suggesting the national territory and urban planning policy direction indicates green infrastructure as crucial infrastructure; green infrastructure is reflected in all new development projects and managed in an integrated manner as a legal plan [32]. Various parks and green spaces can be regarded as representative green infrastructure, but if all social infrastructures constituting a city are expanded to be connected with green infrastructure to form an ecological network in the city, the approach can become a solution to the deterioration of the urban environment and global climate change [4].

5.3. Preparation for Flexible Urban Planning Systems Accommodating Complex Urban Functions

In urban planning, the boundary of urban space serves as a means for separation and severance between uses and functions. In a hyper-connected society in which the Internet of Things (IoT), big data, artificial intelligence (AI), people, and logistics are highly interlinked, these boundaries (e.g., a separation between uses and block classification) are meaningless and can act as a hindrance. Ecotone in the ecosystem is a place where the ecosystem is revitalized by the abundance of biodiversity and population. A cultural Ecotone, in which the Ecotone concept is applied in urban contexts, can induce cultural and regional revitalization in places with functions of residential areas, parks, commerce, and culture.

Currently, there are numerous urban planning constraints in creating smart and compressed cities and implementing three-dimensional urban planning. It is time to prepare a flexible urban planning system in which diverse urban functions can be utilized in a complex way. For instance, in the use zoning system in existing urban planning, classifications of residential, commercial, and industrial uses and green space have limitations; an introduction of new districts, such as a green infrastructure district and a park-based mixed-use district, is required, as is the institutional improvement for flexible urban planning [24].

5.4. Introduction of Green Infrastructure as a Smart Green City with Cutting-Edge Technologies

Large cities of the 21st century are developing and policymakers implement various policies to flexibly respond to changes in conditions, and create eco-friendly and attractive cities equipped with cultural functions and advanced technologies. Relevant cases are: smart growth plans in the US, Huis ten Bosch in Nagasaki, Japan, ecological urban development in Leipzig, Germany, and economic revitalization strategies in Newcastle, the UK. Smart city projects in Seoul and new towns use technologies on a limited basis, mainly information communication, the IoT, and big data. By converting gray infrastructures, such as roads and underground spaces in cities, into green infrastructure, the city can be regarded as a true "smart green city"[5] that utilizes the Fourth Industrial Revolution's technologies that can be used in multiple dimensions while maintaining the urban functions of cities [43]. Many facilities in large cities are outdated and need remodeling; green infrastructure will serve as a three-dimensional urban strategy that goes beyond the limits of existing parks and green spaces, and will contribute to a sustainable urban development model that accommodates diverse fields in combination, such as rest for urban dwellers, movement, community, culture, and art. The will of policymakers is required for national research and development (R&D) support for technological development, securing budgets, and an active introduction of urban policies. Nevertheless, it is expected that green infrastructure will become a solution to global urban issues stated in the UN's SDGs.

5.5. Re-Naturalization of Urban Infrastructure

Along with the population inflows into cities and the expansion of cities, transportation infrastructure, such as roads and railways that connect urban spaces, become representative infrastructure. As this type of infrastructure pollutes the earth, this triggers enormous wastage of resources, and requires new urban infrastructure in the form of automobiles and parking lots. However, means of transport are rapidly changing with the introduction of electric vehicles, autonomous driving, drones, artificial intelligence, etc., which are representative technologies of the Fourth Industrial Revolution. Subsequently, transportation infrastructure, such as road and bridges for securing mobility, and gray infrastructure will also significantly decrease [50]. Transportation infrastructure as a circulation in the industrialization era had the disadvantage of separating the urban space in a linear form, but in the Fourth Industrial Revolution era, two linear spaces connect disconnected areas with a cultural ecotone, thus providing an opportunity to utilize a new infrastructural space connecting people and information [24]. Roads can undergo processes such as recycling, regeneration, and use conversion to obtain new functions through three-dimensional utilization. Examples of such cases are: conversion of the Gyeongui Line railway to parks,

Seoullo 7017, ongoing underground project on the Gyeongin Expressway, and promotion of the underground project on the Gyeongbu Expressway. As for overseas cases, some examples are New York's High Line and Low Line, Boston's Big Dig Project, and Barcelona's Placa de Les Glories.

5.6. Introduction of Parks and Green Space Policy as a Strategic Plan to Enhance Urban Resilience

In terms of the flow of municipal policies during the terms of popularly elected mayors of Seoul, it is noted that the importance of parks and green space has been decreasing. Although citizens' demands for the improvement of the environment have been increasing compared to the first mayoral term, the parks and green space policies have betrayed their limitations because social and economic conditions and people's welfare have received more emphasis. This situation is because the policy was viewed from the perspective of limited urban planning. To introduce green infrastructure strategies for better urban resilience, namely, parks and green space policies, the following measures should be taken. The concept of parks and green spaces should be understood with the expanded concept of green infrastructure to improve the health of citizens and quality of life of urban dwellers, and secure urban competitiveness; the old infrastructure within cities should be upgraded while actively accommodating values such as efficiency. Cities are constantly changing structures populated with various infrastructures and activities of urban residents; urban issues are rapidly changing due to the recent introduction of non-face-to-face contact culture following the outbreak of COVID-19. Along with digital development, the analog sensitivity inherent in humans requires more and more access to nature. Therefore, to solve the problem of low-growth and global environmental problems, such as climate change and urban aging, parks and green space policies should be implemented as a strategic urban plan to enhance urban resilience for the safety, comfort, happiness, and health of the residents.

There were no effect analysis data on major policies, so there was a limitation in presenting directions through specific feedback. However, cities have developed in line with the global environmental policy direction, and sustainability is an immutable value.

6. Conclusions

South Korea has experienced an urbanization rate of over 90% due to rapid industrialization since 1960, and most of the country's people live in cities. The parks and green space policies have been emerging, as green infrastructure has been highlighted as a solution to recent urban issues, such as climate change, fine dust, urban flooding, population shrinkage, and urban decline. In particular, it has been possible to recognize the importance of parks and green space policies according to urban expansion through the history of change in such policies in Seoul. In the future, it is intended to present the direction of parks and green spaces policy to improve the comfortable quality of life of citizens and sustainable urban development. Based on this fact, the following outcomes were achieved.

First, along with urban development, parks and green spaces have developed from a sectoral plan to a comprehensive policy called the parks and green space policy. Since 1960, Korean society has rapidly transitioned from a rural-oriented society to an urban-type society. On account of the economic development and explosive and productive urbanization during the 1970s and 1980s, the Urban Planning Act was amended. Along with land use regulations, systems to prevent the chaotic expansion of large cities and preserve nature and urban environments were introduced. The phenomenon of population concentration in large cities intensified and as follow-up measures of housing supply and economic policies, parks and green space policies were implemented within the framework of urban planning. After the revision of the Local Government Act in 1993, local governments could become the main actor in establishing urban policies. The practical parks and green space policies began to be introduced as an important bundle of municipal policies in response to increasing citizen participation and the demand for a pleasant urban

environment. In South Korea, parks and green spaces policy has become important in the urban planning phase since 1993.

Second, Seoul's parks and green space policies have been determined by changes in socio-economic conditions followed by urban development, the political inclinations of policymakers, and the demands of citizens. Prior to the terms of popularly elected mayors, there were projects, such as community greening, afforestation projects, plans for greening metropolitan areas, and Namsan restoration in accordance with national policies. After the local autonomy era, the citizens' demand for urban environmental improvement increased due to increased citizen participation. From the first term of a popularly elected mayor to the sixth mayor's term, policies have changed in line with the political inclination of policymakers: from quantitative expansion to qualitative improvement of urban green spaces, more green spaces around living zones, creation of parks to secure urban identity, and encouragement of increase in citizen participation in policymaking processes and green space management. In particular, from the fifth term of a popularly elected mayor, policies related to welfare, citizen's participation, and consideration for the socially vulnerable were prioritized; parks and green space policies were pushed to a position with lower priority, showing the difference they had from the strategies for securing urban competitiveness in large cities around the world. The direction of Seoul's parks and green spaces policy was most influenced by the political inclinations of policymakers.

Third, in the era of the Fourth Industrial Revolution, cities are developing into smart cities in which various infrastructure, such as housing, road, and green spaces are not separated but are used in a complex and three-dimensional manner with green infrastructure using cutting-edge technologies. The existing urban planning system cannot accommodate such an altered concept that requires re-establishing parks and green spaces as an expanded concept of green infrastructure. New laws and systems, such as the Green Infrastructure Act for flexible urban planning and park-based mixed-use districts, should be established. Land surface, where the power of nature plays out in cities, creates green infrastructure by applying nature to artificial environments, such as buildings, roads, and bridges. Parks and green space policies should be introduced as new strategies to increase urban resilience in climate change while performing various and complex functions [51].

A legal system should be prepared for the introduction of green infrastructure and sustainable promotion to solve complex problems in the urban environment.

In conclusion, it can be said that the city's parks and green space policy has been most influenced by the political inclinations of policymakers along with the needs of citizens and global trends. Moreover, the perception of parks and green spaces in a narrow sense resulted in limitations in broad policy decisions. Cities are complex adaptive ecosystems that are both dynamic and self-organizing. Therefore, when improving the aging infrastructure of the city, it is necessary to integrate various aspects, such as recreation, community, culture, and art, and introduce a green infrastructure policy that makes the city evolve as a self-organizing ecosystem.

This study analyzed the impact of urban development and the change in the parks and green spaces policy of Seoul, and presented data to predict the past and future of cities under development around the world. For future research, it will be necessary to continuously study the analysis of the effectiveness of major parks and green space policies and citizens' perceptions, specific action plans for parks and green spaces policy as part of a green infrastructure. Research on legal and institutional implementation measures to increase the policy sustainability should continue. Policymakers need a green infrastructure strategy as a political commitment and it will be possible to promote this as a future urban master plan.

Author Contributions: Conceptualization, J.C., G.K.; methodology, J.C., G.K.; data curation, J.C.; writing—original draft preparation, J.C.; writing—review and editing, J.C. and G.K.; visualization, J.C.; supervision, G.K.; project administration, G.K. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Notes

[1] Extracted from "World Urbanization Prospects: The 2018 Revision" published by the United Nations Department of Economic and Social Affairs (DESA).

[2] Gray-infrastructure refers to the economic and social infrastructure that forms the frame of the city as the existing or urban infrastructure. Most of the facilities, such as roads, water supply and sewage, electricity, waste treatment, and ports, are powered by fossil fuels.

[3] The Sustainable Development Goals (SDGs) are the agendas to be achieved by 2030, as postulated at the 70th UN General Assembly in 2015. Along with the slogan "Leave no one behind", the 17 individual goals and 169 targets present the direction for humankind to pursue in five areas: People, Planet, Prosperity, Peace, and Partnership. It is also called the 2030 Agenda for Sustainable Development as a goal to be implemented by developed and developing countries together from 2016 to 2030. The 17 goals (SDGs 17) include: (1) No Poverty, (2) Zero Hunger, (3) Good Health and Well-being, (4) Quality Education, (5) Gender Equality, (6) Clean Water and Sanitation, (7) Affordable and Clean Energy, (8) Decent Work and Economic Growth, (9) Industry, Innovation, and Infrastructure, (10) Reducing Inequality, (11) Sustainable Cities and Communities, (12) Responsible Consumption and Production, (13) Climate Action, (14) Life Below Water, (15) Life On Land, (16) Peace, Justice, and Strong Institutions, (17) Partnerships for the Goals.

[4] Neighborhood parks are the places to which park users have easier access and they are frequently used in neighborhood living zones; they encompass children's parks, small parks, parks for sports, culture, history, and waterfront, and other urban natural parks (8% [Cemetery Park, Seoul Grand Park, and national parks are excluded]).

[5] A smart green city can be considered as an urban trend that emphasizes securing sustainability in consideration of social and economic sectors, while strengthening the environmental characteristics of existing smart cities (Choi et al., 2020).

References

1. Nor, A.N.M.; Aziz, H.A.; Nawawi, S.A.; Jamil, R.M.; Abas, M.A.; Hambali, K.A.; Yusoff, A.H.; Ibrahim, N.; Rafaai, N.H.; Corstanje, R.; et al. Evolution of Green Space under Rapid Urban Expansion in Southeast Asian Cities. *Sustainability* **2021**, *13*, 12024. [CrossRef]
2. Choi, Y.H. A Study on Seoul Parks and Green Space Policy. Ph.D. Thesis, Korea University, Seoul, Korea, 2005.
3. Mayer, A.L.; Buma, B.; Davis, A.; Gagné, S.A.; Loudermilk, E.L.; Scheller, R.; Schmiegelow, F.K.; Wiersma, Y.; Franklin, J. How Landscape Ecology Informs Global Land-Change Science and Policy. *BioScience* **2016**, *66*, 458–469. [CrossRef]
4. Kang, J.E. *Green Infrastructure Strategy for Urban Climate Adaptation*; Korea Environment Institute: Sejong-si, Korea, 2012.
5. Colding, J.; Gren, A.; Barthel, S. The Incremental Demise of Demise of Urban Green Space. *Land* **2020**, *9*, 162. [CrossRef]
6. Cho, S.H. Practical Strategies for Urban Regeneration through an Application of Landscape Urbanism. *J. Korean Inst. Landsc. Archit.* **2010**, *38*, 109–118.
7. Seoul Metropolitan Government. *2030 Seoul Parks Green Area Master Plan*; Seoul Metropolitan Government: Seoul, Korea, 2015.
8. Statistics Korea. Available online: http://kostat.go.kr (accessed on 2 September 2019).
9. Seoul City Homepage. Available online: https://www.seoul.go.kr (accessed on 19 April 2021).
10. The Seoul Institute. Available online: https://www.si.re.kr (accessed on 1 May 2021).
11. Seoul Museum of History. Available online: https://museum.seoul.go.kr (accessed on 19 April 2021).
12. Kim, B.S. Influence of National and Urban Policies on the Characteristics of Urban Change in Korea. Ph.D. Thesis, Hanyang University, Seoul, Korea, 2011.
13. Johnson, M.T.J.; Munshi-South, J. Evolution of life in urban environments. *Science* **2017**, *358*, eaam8327. [CrossRef] [PubMed]
14. Uttara, S.; Bhuvandas, N.; Aggarwal, V. Impacts of urbanisation on environment. *Int. J. Res. Eng. Appl. Sci.* **2012**, *2*, 1637–1645.
15. Zhang, X.Q. The trends, promises and challenges of urbanization in the world. *Habitat Int.* **2016**, *54*, 241–252. [CrossRef]
16. United Nations, Department of Economic and Social Affairs, Population Division. *World Urbanization Prospects: 2018 Revision (ST/ESA/SER.A/421)*; United Nations: New York, NY, USA, 2019.
17. Choi, S.C.; Park, S.H.; Lee, H.J.; Cho, J.H.; Lee, J.W. *The 70th Anniversary of Liberation: The History of Urban Planning in Korea*; Korea Planning Association, Urban Information: Seoul, Korea, 2015; pp. 3–32.
18. Seoul Metropolitan Government. *A Study on the Policy Direction of Parks and Green Space in Seoul*; Seoul Metropolitan Government: Seoul, Korea, 1995.
19. Oh, C.S. The Changes and Issues of the Urban Park Law 1934 to 2017. Ph.D. Thesis, Seoul National University, Seoul, Korea, 2018.

20. TEP. Towards a Green Infrastructure Framework for Greater Manchester. 2008. Available online: https://www.wigan.gov.uk (accessed on 10 December 2021).
21. Lee, J.H.; Jo, D.G.; Yoo, Y.J. A Study on the Green Infrastructure Plan for Sustainable City. In Proceedings of the Korean Society of Environmental Ecology Conference, Go Yang si, Korea, 17 April 2015; Volume 25, pp. 73–74.
22. Foster, J.; Lowe, A.; Winkelman, S. *The Value of Green Infrastructure for Urban Climate Adaptation*; The Center for Clean Air Policy: Washington, DC, USA, 2011.
23. Randolph, J. *Environmental Land Use Planning and Management*; Island Press: Washington, DC, USA, 2003.
24. Cho, S.H. *Evolutionary City: The Unfolding of the Era of Digilogue Landscape City*; Gimundang: Paju-si, Korea, 2018.
25. Noh, S.P.; Park, H.S.; Park, Y.M. *Understanding Policy Studies*; B&M Books Publishing: Seoul, Korea, 1999.
26. Benedict, M.A.; McMahon, E.T. *Green Infrastructure: Linking Landscape and Communities*; Island Press: Washington, DC, USA, 2006.
27. Saha, D.; Paterson, R.G. Local government efforts to promote the "Three Es" of sustainable development survey in medium to large cities in the United States. *J. Plan. Educ. Res.* **2008**, *28*, 21–37. [CrossRef]
28. Van Dijk, T. Who is in charge of the urban fringe? Neoliberalism, open space preservation and growth control. *Plan. Pract. Res.* **2009**, *24*, 343–361. [CrossRef]
29. Lee, E.-S.; Noh, C.-W.; Sung, J.-S. Meaning Structure of Green Infrastructure—A Literature Review about Definitions. *J. Korean Inst. Landsc. Archit.* **2014**, *42*, 65–76. [CrossRef]
30. Cho, S.H. Urban Area: Urban Regeneration Strategy in the Era of Low Carbon and Green Growth: Strategy and Practice for Green Infrastructure, Chungnam Development Institute. *Chungnam Rev.* **2009**, *47*, 56–69.
31. Park, J.-C.; Yang, H.-M.; Jang, B.-K. Policy for Establishment of Green Infrastructure. *J. Korean Inst. Landsc. Archit.* **2012**, *40*, 43–50. [CrossRef]
32. Yoon, S.-J. The Consolidation and Implementation of Green Infrastructure Policy in Urban Spatial Planning—Focused on the London Plan & the All London Green Grid. *J. Korean Inst. Landsc. Archit.* **2016**, *44*, 83–95. [CrossRef]
33. Kim, S.H. A Study on the Storm Water Green Infrastructure Strategy for the Sound Hydrological Cycle Management in Urban Areas. Ph.D. Thesis, Seoul National University, Seoul, Korea, 2014.
34. EPA. Green Infrastructure Case Studies. In *Municipal Policies for Managing Stormwater with Green Infrastructure*; Center for Public Impact: Washington, DC, USA, 2010.
35. Lee, J.H. *Trends in Global Urban Development through Urban Change*; Boseonggak: Paju-si, Korea, 2009.
36. Chang, S.H. *Korean War and Urbanization in Seoul, Korea Center for City and Environment Research*; Urban Research: Seoul, Korea, 2002; Volume 8, pp. 154–191.
37. Korea Research Institute for Human Settlements. Available online: https://www.krihs.re.kr (accessed on 5 May 2021).
38. Lee, Y.W. Urban Paradigm Change in the Era of Low Growth. Korea Local Administrative Mutual Aid Association. *Urban Aff.* **2015**, *50*, 18–21.
39. Zhang, L.; Tan, P.Y.; Diehl, J. A conceptual framework for studying urban green spaces effects on health. *J. Urban Ecol.* **2017**, 1–13. [CrossRef]
40. Ugolini, F.; Sanesi, G.; Steidle, A.; Pearlmutter, D. Speaking "Green": A Worldwide Survey on Collaboration among Stakeholders in Urban Park Design and Management. *Forests* **2018**, *9*, 458. [CrossRef]
41. Kwartnik-Pruc, A.; Trembecka, A. Public Green Space Policy Implementation: A Case Study of Krakow, Poland. *Sustainability* **2021**, *13*, 538. [CrossRef]
42. DeSouza, K.C.; Hunter, M.; Jacob, B.; Yigitcanlar, T. Pathways to the Making of Prosperous Smart Cities: An Exploratory Study on the Best Practice. *J. Urban Technol.* **2020**, *27*, 3–32. [CrossRef]
43. Choi, H.S.; Park, C.S.; Sin, D.W.; Song, S.G.; Kim, G.G. *Direction for a Transition toward Smart Sustainable Cities Based on the Diagnosis of the Smart City Plans*; Korea Environment Institute: Sejong-si, Korea, 2020.
44. Choi, H.S.; Ahn, S.E.; Lee, h.S.; Song, S.G.; Lee, G.S. *The Transformation of Urban Park and Green Space Policy for Sustainability*; Korea Environment Institute: Sejong-si, Korea, 2019.
45. The Seoul Institute. *Seoul & World Cities: Comparative Reference on Urban Context and Infrastructure*; The Seoul Institute: Seoul, Korea, 2017.
46. Ahn, S.I. A Comparative Study on Mayors' Leadership in Seoul Metropolitan Government. Ph.D. Thesis, University of Seoul, Seoul, Korea, 2008.
47. Jeon, C.S. A Study on Changes in Environmental Policy in Seoul: Focusing on Environmental Policies by a Popularly Elected Mayor. Master's Thesis, Hankuk University of Foreign Studies, Seoul, Korea, 2016.
48. Feltynowski, M.; Kronenberg, J. Urban Green Spaces—An Underestimated Resource in Third-Tier Towns in Poland. *Land* **2020**, *9*, 453. [CrossRef]
49. Kim, J. A Study on Local Government Heads' Cognitive Policy Orientations and Local Governments' Practical Policy Orientations. Master's Thesis, Ewha Woman's University, Seoul, Korea, 2014.
50. Harari, Y. *Homo Deus*; Kimyoungsa: Paju-si, Korea, 2017.
51. Meerow, S.; Newell, J.P.; Stults, M. Defining urban resilience: A review. *Landsc. Urban Plan.* **2016**, *147*, 38–49. [CrossRef]